I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted today via the Office electronic filing system (EFS-Web) in accordance with 37 CFR §1.6 (a)(4).

Date: April 3, 2013 Signature: /Stephanie Dominguez/
Printed Name: Stephanie Dominguez

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination of: Inventors: Payne, J. David Patent No.: 7,822,816 Filed: August 19, 2003 For: SYSTEM AND METHOD FOR DATA MANAGEMENT	REQUEST FOR REEXAMINATION UNDER 35 U.S.C. §§ 302-307 AND 37 C.F.R. § 1.510

Mail Stop *Ex Parte* Reexamination
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR *EX PARTE* REEXAMINATION OF U.S. PATENT 7,822,816

Instacart, Ex. 1061
Instacart v. Fall Line
IPR2025-00958

TABLE OF CONTENTS

REQUEST FOR *EX PARTE* REEXAMINATION OF U.S. PATENT 7,822,816 I

TABLE OF EXHIBITS IV

A. PRIOR ART (PA) IV

B. RELEVANT PATENT MATERIALS (PAT) IV

C. OTHER EXHIBITS (OTH) IV

REQUEST FOR EX PARTE REEXAMINATION OF U.S. PATENT 7,822,816 1

I. **REQUIREMENTS FOR *EX PARTE* REEXAMINATION UNDER 37 C.F.R. § 1.510 ..... 2**

II. **OVERVIEW 3**

A. DESCRIPTION OF THE '816 PATENT 3

B. THE '816 PATENT APPLICATION PROSECUTION HISTORY 3

C. RELATED CO-PENDING LITIGATION REQUIRES TREATMENT WITH SPECIAL DISPATCH 4

D. CLAIM CONSTRUCTION 5

III. **GEICO'S PRESENTATION OF UNPATENTABILITY TO MACROSOLVE 6**

IV. **SUMMARY OF EACH SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY UNDER 37 C.F.R. § 1.510 (B)(2) 15**

A. ROSSMANN IN VIEW OF RAPPAPORT RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-3 AND 5-14 15

B. ROSSMANN IN VIEW OF RAPPAPORT AND BOWEN RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 14 17

C. ROSSMANN IN VIEW OF FALLS RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-14 19

D. BENIGNO IN VIEW OF FALLS RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-14 21

E. BENIGNO IN VIEW OF RAPPAPORT RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-14 24

F. WRIGHT IN VIEW OF WARTHEN, RAPPAPORT, BROOKLER , AND ROSSMANN RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1, 2, 5-7, AND 11-14 27

V. **MANNER OF APPLYING THE CLAIMS AS REQUIRED BY 37 C.F.R. § 1.510 (B)(2) 29**

A. CLAIMS 1-3 AND 5-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY ROSSMANN IN VIEW OF RAPPAPORT AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART 29

B. CLAIM 4 OF THE '816 PATENT ARE RENDERED OBVIOUS BY ROSSMANN IN VIEW OF RAPPAPORT, BOWEN, AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART 80

C. CLAIMS 1 -14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY ROSSMANN IN VIEW OF FALLS AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART 85

D. CLAIMS 1-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY BENIGNO IN VIEW OF FALLS AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART 170

E. CLAIMS 1-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY BENIGNO IN VIEW OF RAPPAPORT AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART 277

F. CLAIMS 1, 2, 5-7, AND 11-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY WRIGHT, RAPPAPORT, WARTHEN, BROOKLER, AND ROSSMANN AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART 349

VI. **CONCLUSION 391**

TABLE OF EXHIBITS

LIST OF EXHIBITS

The exhibits to the present Request are arranged in two groups: prior art ("PA"), relevant patents ("PAT"), and Other Exhibits (OTH).

A. PRIOR ART (PA)

PA-SB08A/B	USPTO Form SB/08A/B
PA-A	U.S. Patent No. 5,704,029 to Wright ("Wright")
PA-B	U.S. Patent No. 6,477,373 to Rappaport et al. ("Rappaport")
PA-C	U.S. Patent No. 6,584,464 to Warthen ("Warthen")
PA-D	U.S. Patent App. No. 2002/0007303 to Brookler et al. ("Brookler")
PA-E	European Patent Application EP 0779,759 to Rossmann ("Rossmann")
PA-F	PCT Published Application WO 99/33390 to Benigno ("Benigno")
PA-G	U.S. Patent No. 5,991,771 to Falls et al. ("Falls")
PA-H	U.S. Patent No. 5,442,786 to Bowen ("Bowen")

B. RELEVANT PATENT MATERIALS (PAT)

PAT-A	U.S. Patent No. 7,822,816 ("the '816 patent")

C. OTHER EXHIBITS (OTH)

OTH-A	PowerPoint showing unpatentability of claim 1 of the '816 patent.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination of: Inventors: Payne, J. David Patent No.: 7,822,816 Filed: August 19, 2003 For: SYSTEM AND METHOD FOR DATA MANAGEMENT	REQUEST FOR REEXAMINATION UNDER 35 U.S.C. §§ 302-307 AND 37 C.F.R. § 1.510

Mail Stop *Ex Parte* Reexamination
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR EX PARTE REEXAMINATION OF U.S. PATENT 7,822,816

Dear Sir:

Pursuant to 35 U.S.C. §§ 302-307, 37 C.F.R. § 1.510, and MPEP § 2295, GEICO Corporation, GEICO Casualty Company, GEICO General Insurance Company, GEICO Indemnity Company and Government Employees Insurance Company (collectively, "GEICO") (herein after "Requester") hereby respectfully request reexamination of Claims 1-14 U.S. Patent No. 7,822,816 ("the '816 patent") filed and issued to. *See* Exhibit PAT-A.

This Request is based on the cited prior art documents set forth herein and on the accompanying Form PTO-SB/08A/B. *See* Exhibit PA-SB/08A/B. All of the cited prior art patents and publications constitute effective prior art as to the claims of the 1-14 patent under 35 U.S.C. § 102 and 35 U.S.C. § 103.

Pursuant to 37 C.F.R. § 1.510 Requester hereby respectfully requests reexamination pursuant to 35 U.S.C. §§ 301 *et seq.* and 37 C.F.R. § 1.510 *et. seq.*, of Original Claims 1-14 of the '816 patent. Reexamination is requested in view of the substantial new questions of patentability ("SNQs") set forth in detail below and in the accompanying claim charts. Requester

reserves all rights and defenses available including, without limitation, defenses as to invalidity and unenforceability. By simply filing this Request in compliance with applicable statutes, rules, and regulations, Requester does not represent, agree or concur that the '816 patent is enforceable. By asserting the SNQs herein, Requester specifically asserts that Original Claims 1-14 of the '816 patent are in fact not patentable.

Accordingly, the U.S. Patent and Trademark Office ("the Office") should reexamine and find claims 1-14 of the '816 patent unpatentable and cancel these claims, rendering them null, void, and otherwise unenforceable.

I. REQUIREMENTS FOR *EX PARTE* REEXAMINATION UNDER 37 C.F.R. § 1.510

Requester satisfies each requirement for *Ex Parte* reexamination of the '816 patent pursuant to 37 C.F.R. § 1.510. A full copy of the '816 patent is submitted herein as Exhibit PAT-A in accordance with 37 C.F.R. § 1.510(b)(4)

Pursuant to 37 C.F.R. §1.510(b)(3), a copy of every patent or printed publication relied upon to present an SNQ is submitted herein at Exhibits PA-A through PA-H, citation of which may be found on the accompanying Form PTO-SB/08A as Exhibit PTO-SB/08A in accordance with 37 C.F.R. § 1.510. Each of the cited prior art publications constitute effective prior art as to the claims 1-14 of the '816 patent under 35 U.S.C. § 102 and 35 U.S.C. § 103. Furthermore, each piece of prior art submitted was either not considered by the Office during the prosecution of the '816 patent or is being presented in a new light under MPEP § 2242 as set forth in the detailed explanation below and in the attached claim charts.

A statement pointing out each SNQ based on the cited patents and printed publications, and a detailed explanation of the pertinency and manner of applying the patents and printed publications to claims 1-14 of the '816 patent, is presented below and in attached claim charts in accordance with 37 C.F.R. § 1.510(b)(2).

A copy of this request has been served in its entirety on the patent owner in accordance with 37 C.F.R. § 1.510(b)(5) at the following address:

In accordance with 37 C.F.R. § 1.510(a), a credit card authorization to cover the Fee for reexamination of $12,000.00 (large entity) is attached. If this authorization is missing or defective, please charge the Fee to the Novak Druce and Quigg Deposit Account No. 14-1437.

II. OVERVIEW

A. DESCRIPTION OF THE '816 PATENT

The '816 patent generally discusses a system or method that automates the manual activities associated with completion of forms, for example hospital intake forms. This automation takes place via computerized questionnaires that have the questions filed out locally and then transmitted and stored in a central database. '816 patent at 4:55-60. The system contemplates having an operating system that allows multiple devices to access the data stored in the database. '816 at 5:6-11.

A specific example provided by the '816 patent is for a "handheld computer" to accept the inputs of an internet based questionnaire. '816 patent at 8:5-37. A user builds the questionnaire by putting questions into a form and then the server will send the completed questionnaire to the appropriate handheld devices. '816 at 8:38-67. Based on this system, the '816 patent states that this allows a system where questions in a questionnaire are updated at the server and sent to each of the handhelds, thereby keeping a consistent questionnaire throughout the system. '816 patent at 9:1-14.

B. THE '816 PATENT APPLICATION PROSECUTION HISTORY

The Examiner during the original prosecution rejected claims 1 and 5 as anticipated by Lew (U.S. Patent Application No. 2004/0210472), which the Examiner found to disclose each and every limitation of the claims. *See* OA issued August 10, 2006 at 2-3. The Examiner found that Sendowski (U.S. Patent Application Publication No. 2003/0198934) anticipated claim 7, and that claims 2-4, 6, and 9-11 were rendered obvious by Lew in view of Sendowski. *See* OA issued August 10, 2006 at 3-9. Finally, the Examiner found that claim 8 was obvious over Sendowski in view of Joao (U.S. Patent Application No. 2001/0056374). *See* OA issued August 10, 2006 at 9.

In response on February 12, 2007, Patent Owner amended the claims in an attempt to overcome the prior art, adding limitations that are not found in the claims at issue in this proceeding. *See* Reply filed February 12, 2007. After re-filing the Reply due to a non-compliant amendment, the Examiner again rejected the claims on May 22, 2007, maintaining the anticipation rejection of claim 7 over Sendowski, while rejecting the remaining claims as obvious over Lew (U.S. Patent Application Publication No. 2004/0210472) and Porter (U.S. Patent No. 6,163,811) or Lew in view of Porter and Sendowski. *See* OA issued May 22, 2007. Patent Owner's only argument that was applicable after the new grounds of rejections was that

Sendowski doesn't disclose a "loosely networked computer." The Examiner disagreed and found that the disclosure of connecting to the internet was fits within the broadest reasonable definition of that phrase based on the Patent Owner's disclosed embodiments. *See* OA issued May 22, 2007 at 12.

To overcome the rejections of the May 22, 2007 Office Action, Patent Owner filed declarations under 37 C.F.R. 1.131 to antedate the references. *See* Reply filed September 24, 2007. However, the Examiner found that the Declaration was not sufficient to establish prior conception, and therefore, the Patent Owner failed to overcome the rejections. *See* OA issued October 30, 2007 at 13. In response, the Patent Owner reargued that the Declaration was sufficient and asked for reconsideration in light of a document that allegedly showed proof of conception. *See* Reply filed April 30, 2008. Based on this further evidence, the prior art of record was rendered moot and the Examiner withdrew the rejections of record, but provided new grounds of rejection over Peters (U.S. Patent No. 5,842,195) and Joao (U.S. Patent Application No. 2001/0056374) or Porter (U.S. Patent No. 6,163,811) and Brookler (U.S. Patent Application No. 2002/0007303.) *See* Office Action issued September 4, 2008.

There were some intermediate Office Actions and responses, but on May 3, 2010 Patent Owner filed a final claim set that was deemed allowable by the Examiner. Specifically, after cancelling four claims via an Examiner's Amendment, the claims were allowed because:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3.

C. Related Co-Pending Litigation Requires Treatment with Special Dispatch

The '816 patent is presently the subject of *Macrosolve, Inc. v. GEICO Insurance Agency Case No. 6:12-cv-74* pending in the U.S. District Court for the Eastern District of Texas.

Accordingly, pursuant to 35 U.S.C. § 314, Requester respectfully urges that this Request be granted and reexamination conducted with "special dispatch" in accordance with M.P.E.P. § 2261.

D. CLAIM CONSTRUCTION

For purposes of this Request, the claim terms are presented by the Requester in accordance with 37 C.F.R. § 1.555(b) and MPEP § 2111. Specifically, each term of the claims is to be given its "broadest reasonable construction" consistent with the specification. MPEP § 2111; *In re Swanson*, No. 07-1534 (Fed. Cir. 2008); *In re Trans Texas Holding Corp.*, 498 F.3d 1290, 1298 (Fed. Cir. 2007) (citing *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984)).

Although the District Court has yet to rule on the scope of these claim limitations, the Federal Circuit noted in *Trans Texas* that the Office has traditionally applied a broader standard than a Court does when interpreting claim scope. MPEP § 2111. The Office applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997). The rationale underlying the "broadest reasonable construction" standard is that it reduces the possibility that a claim, after issue or certificate of reexamination, will be interpreted more broadly than is justified. 37 C.F.R. § 1.555(b), MPEP § 2111.

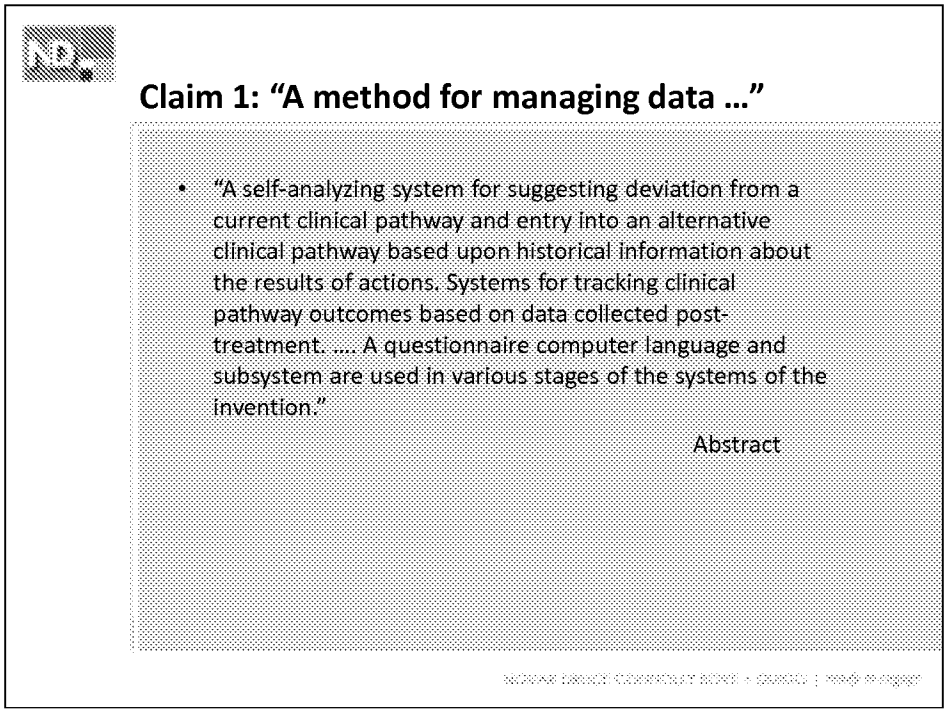
Because the standards of claim interpretation used in the courts in patent litigation are different from the claim interpretation standards used in the Office in claim examination proceedings (including reexamination), any claim interpretations submitted herein for the purpose of demonstrating an SNQ are neither binding upon Requester in any litigation related to the '816 patent; nor do such claim interpretations necessarily correspond to the construction of claims under the legal standards that are mandated to be used by the Courts in patent litigation. *See* MPEP § 2286 II (determination of an SNQ is made independently of a court's decision on validity because of different standards of proof and claim interpretation employed by the District Courts and the Office); *see also Trans Texas Holding*, 498 F.3d at 1297-98; *In re Zletz*, 893 F.2d 319, 322, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

The interpretation and/or construction of the claims in the '816 patent presented either implicitly or explicitly herein should not be viewed as constituting, in whole or in part, Requester's own interpretation and/or construction of such claims, but instead should be viewed

as constituting an interpretation and/or construction of such claims as may be raised by the Patent Owner through a broadest reasonable claim construction. In fact, Requester expressly reserves the right to present its own interpretation of such claims at a later time, which interpretation may differ, in whole or in part, from that presented herein.

III. POWERPOINT REGARDING UNPATENTABILITY OF CLAIM 1 OF THE '816 PATENT

Prior to instituting this ex parte proceeding in the Office, attached document OTH-A was presented to patent owner Macrosolve to demonstrate that exemplary claim 1 of the '816 patent is unpatentable. While not explicitly stated in the presentation, the reference in the PowerPoint is Benigno. The unpatentability portion of the PowerPoint against claim 1 is excerpted below, as a primer of the teachings in the Benigno publication. A more detailed treatment of Benigno is in Sections IV and V, below.



"(a) creating a questionnaire …"

- "Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires."

12:17-31

"(b) tokenizing said questionnaire …"

- "clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*.... Question ID is the identifier of the question itself."

19:10-24

"(c) establishing a first wireless … connection" (1 of 4)

- "In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. … may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc."

47:6-13

"(c) establishing a first wireless … connection" (2 of 4)

- "Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure 1B."

47:6-8

"(c) establishing a first wireless…connection" (3 of 4)

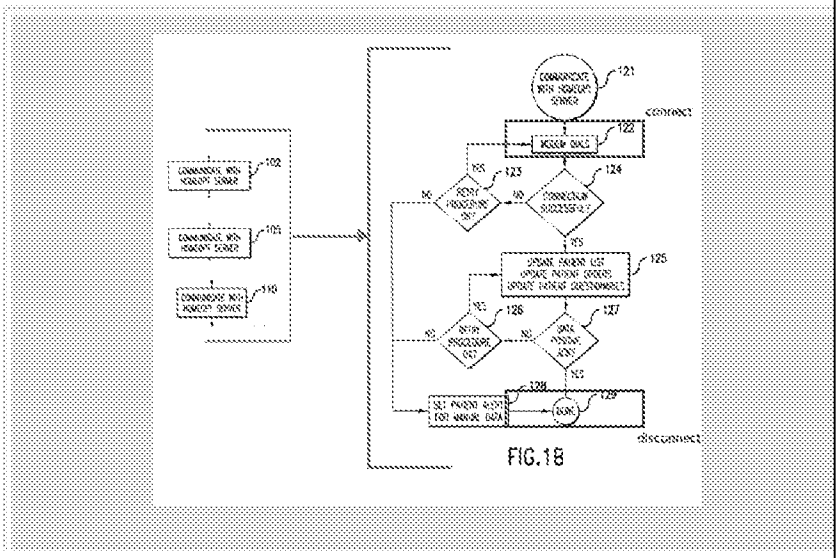


FIG.1B

"(c) establishing a first wireless…connection" (4 of 4)

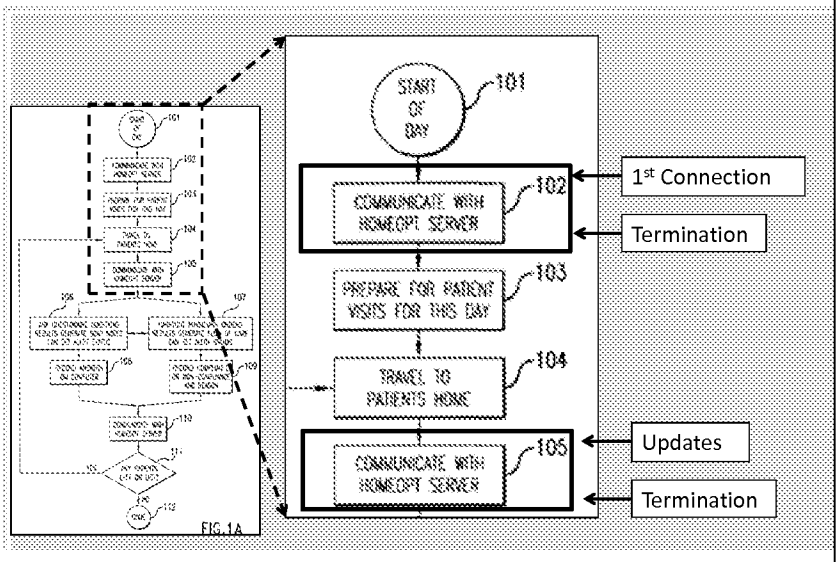


FIG.1A

"(d) transmitting said plurality of tokens…"

- "In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s)."

46:4-7

"(e) terminating first wireless … connection…" (1 of 3)

- "In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modem and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link."

46:4-9

"(e) terminating first wireless…connection…" (2 of 3)

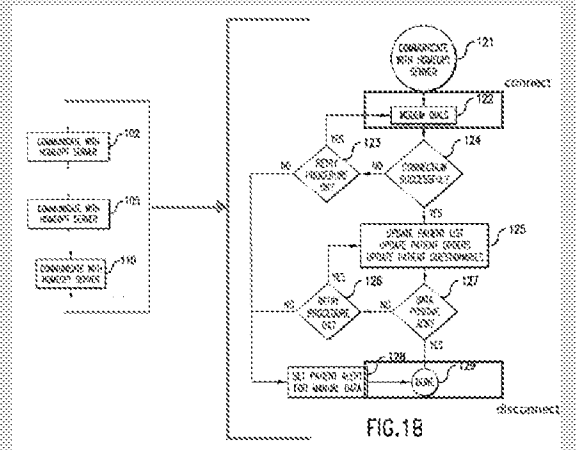


FIG.1B

"(e) terminating first wireless…connection…" (3 of 3)

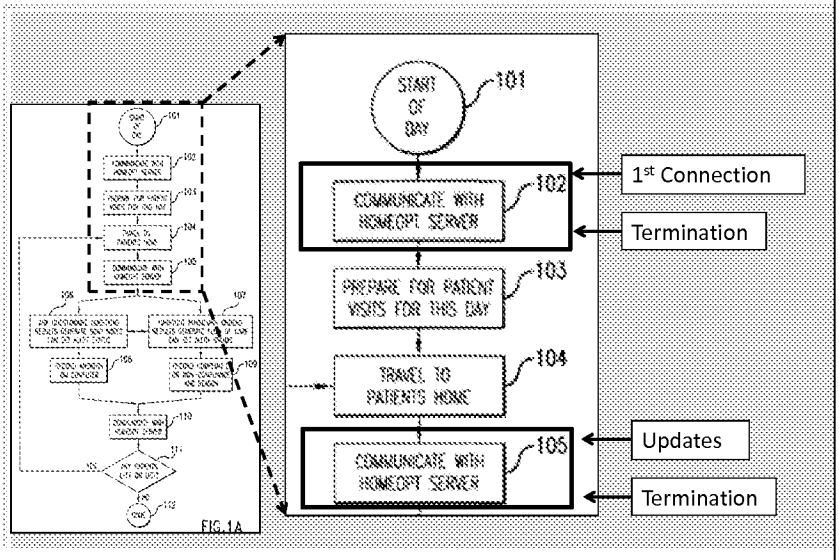


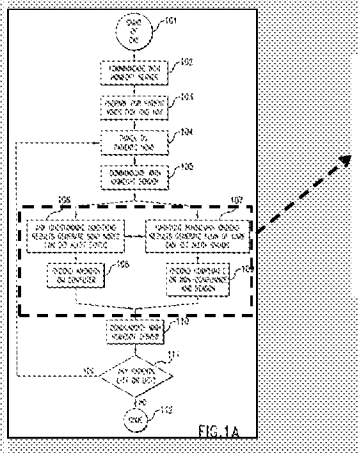
FIG.1A

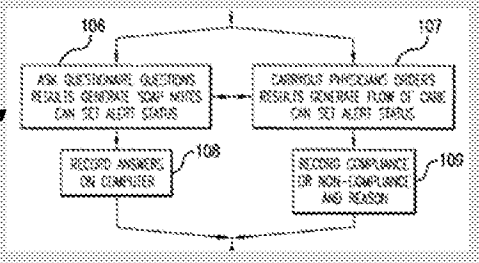
"(f) … executing a portion of said plurality of tokens" (1 of 2)

- "In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. … for ultimate retransmission to the server 402."

46:16-20

"(f) … executing a portion of said plurality of tokens" (2 of 2)



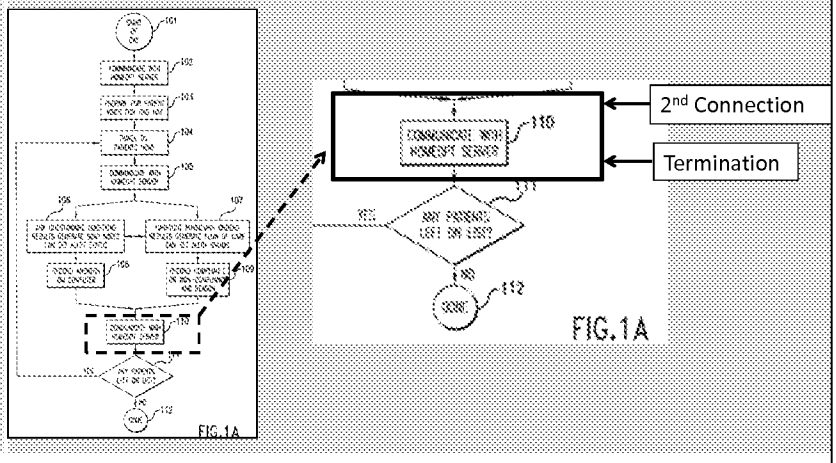


"(g) establishing a second wireless … connection…" (1 of 2)

- "In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105."

46:30-31

"(g) establishing a second wireless … connection…" (2 of 2)



"(h) after said second [connection]… transmitting… response"

- "In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. Again, all such stored data may later be transmitted back to the server 402."

  46:16-28

- "In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105."

  46:30-31

"(i) storing said transmitted response at said server"

- "The questionnaire and its answers are all stored."

  23:10

- "Again, all such stored data may later be transmitted back to the server 402."

  46:27-28

IV. SUMMARY OF EACH SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY UNDER 37 C.F.R. § 1.510 (B)(2)

A. ROSSMANN IN VIEW OF RAPPAPORT RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-3 AND 5-14

The following prior art is applied in the SNQ presented herein:

- European Patent Application EP 0779,759 to Rossmann ("Rossmann") – filed on December 11, 1996 and published on June 18, 1997 making it effective prior art under 35 U.S.C. § 102; and
- U.S. Patent No. 6,477,373 to Rappaport et al. ("Rappaport") – filed on August 10, 2000, claiming priority to August 10, 1999, and issued November 5, 2002, making it effective prior art under 35 U.S.C. § 102.

Rossmann and Rappaport were never presented individually or in combination to the Office during the original prosecution. Accordingly, by teaching the limitations of the claims that the Office found missing in the prior art, this combination raises a substantial new question of patentability.

In the prosecution history, the Office found that:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. Rossmann in view of Rappaport teaches these limitations.

Rossmann teaches a card deck wherein each of the cards is a single operation and can be communicated to a computer from a server and from a computer to a server through any known two-way data communication network. Rossmann p. 15, lines 8-12, p. 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41. Further, since each of the cards in the card deck can be transmitted through a single operation, the connection is effectively established and terminated with each transmission. In addition, Rossmann is combined with Rappaport which teaches that the number of channels available for cellular sessions is limited, and data transfers can be

interrupted (i.e., terminated) to allow for real-time communication. Rappaport at 7:44-63. Based on this combination, it would be obvious to a person of ordinary skill in the art to terminate and reestablish data communications between the mobile device and server of Rossmann.

Furthermore, Rappaport teaches that the data can be processed while the data connection is not in use, because the mobile device continues to function "undisturbed by link failures" and "in a manner that is transparent to end users." Rappaport at 2:44-58. Accordingly, the mobile devices can continue to process data in a transparent manner, as if the data connection is still available, in anticipation of reestablishing the connection.

After the user response data is processed at the mobile device, the cards are then transmitted to a server for collection and processing as appropriate within the system taught by Rossmann. Rossmann p. 9, lines 15-18; p. 11, line 53 – p. 12, line 2, and p. 15, lines 23-27.

The technological features found absent in the prior art were:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. However, Rossmann in view of Rappaport teaches these technological features. As discussed above, Rossmann teaches a system involving a card deck wherein the server and mobile device can communicate the cards to the other device. Further, Rossmann can be combined with Rappaport which teaches that the cards are transmitted between the server and a mobile device.

Accordingly, an Examiner would consider Rossmann in view of Rappaport and the knowledge of a person of ordinary skill in the art important in determining patentability as it presents the new technological feature that was found absent in the prior art and deemed important during the prosecution of the '816 patent. *See* Rossmann p. 15, lines 8-12, 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41; Rappaport at 7:44-63. Such an SNQ is not cumulative,

as the references meet all the claim limitations for claims 1-3 and 5-14 and the references were not presented or discussed in combination during the prosecution of the '816 patent.

In view of the above, reexamination should be ordered, and the aforementioned claim should be rendered null, void, and otherwise unenforceable in light of this reexamination request.

B. ROSSMANN IN VIEW OF RAPPAPORT AND BOWEN RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 4

The following prior art is applied in the SNQ presented herein:

- European Patent Application EP 0779,759 to Rossmann ("Rossmann") – filed on December 11, 1996 and published on June 18, 1997 making it effective prior art under 35 U.S.C. § 102; and
- U.S. Patent No. 6,477,373 to Rappaport et al. ("Rappaport") – filed on August 10, 2000, claiming priority to August 10, 1999, and issued November 5, 2002, making it effective prior art under 35 U.S.C. § 102.
- U.S. Patent No. 5,442,786 to Bowen ("Bowen") – filed on April 28, 1994 and issued on August 15, 1995 making it effective prior art under 35 U.S.C. § 102.

Rossmann, Rappaport and Bowen were never presented individually or in combination to the Office during the original prosecution. Accordingly, by teaching the limitations of the claims that the Office found missing in the prior art, this combination raises a substantial new question of patentability.

In the prosecution history, the Office found that:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. Rossmann in view of Rappaport teaches these limitations.

Rossmann teaches a card deck wherein each of the cards is a single operation and can be communicated to a computer from a server and from a computer to a server through any known two-way data communication network. Rossmann p. 15, lines 8-12, p. 14, lines 35-38, p. 26,

lines 5-6, and p. 28, lines 39-41. Further, since each of the cards in the card deck can be transmitted through a single operation, the connection is effectively established and terminated with each transmission. In addition, Rossmann is combined with Rappaport which teaches that the number of channels available for cellular sessions is limited, and data transfers can be interrupted (i.e., terminated) to allow for real-time communication. Rappaport at 7:44-63. Based on this combination, it would be obvious to a person of ordinary skill in the art to terminate and reestablish data communications between the mobile device and server of Rossmann.

Furthermore, Rappaport teaches that the data can be processed while the data connection is not in use, because the mobile device continues to function "undisturbed by link failures" and "in a manner that is transparent to end users." Rappaport at 2:44-58. Accordingly, the mobile devices can continue to process data in a transparent manner, as if the data connection is still available, in anticipation of reestablishing the connection.

After the user response data is processed at the mobile device, the cards are then transmitted to a server for collection and processing as appropriate within the system taught by Rossmann. Rossmann p. 9, lines 15-18; p. 11, line 53 – p. 12, line 2, and p. 15, lines 23-27.

Finally, claim 4, requires, amongst other limitations, "assigning at least one token to each branch in said questionnaire to identify the required program control associated with said branch." Bowen teaches that it was well known in the art to develop questionnaires based on "hierarchical data tree[s]" where "the system first creates a vertical leg of the data tree, before creating horizontal branches…." Bowen at Abstract. Accordingly, since Rossmann teaches that the application discussed therein can be used universally on any two way communication device, it would be obvious to a person of ordinary skill in the art that the hierarchical tree described by Bowen can be used to create a questionnaire in Rossmann. Rossmann at page 3, lines 41-49.

The technological features found absent in the prior art were:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the

user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. However, Rossmann in view of Rappaport and Bowen teaches these technological features. As discussed above, Rossmann teaches a system involving a card deck wherein the server and mobile device can communicate the cards to the other device. Further, Rossmann can be combined with Rappaport and Bowen which teach that the cards are transmitted between the server and a mobile device and that the questionnaire can be a tree structure.

Accordingly, an Examiner would consider Rossmann in view of Rappaport and Bowen and the knowledge of a person of ordinary skill in the art important in determining patentability as it presents the new technological feature that was found absent in the prior art and deemed important during the prosecution of the '816 patent. *See* Rossmann p. 15, lines 8-12, 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41; Rappaport at 7:44-63; Bowen at Abstract. Such an SNQ is not cumulative, as the references meet all the claim limitations for claim 4 and the references were not presented or discussed in combination during the prosecution of the '816 patent.

In view of the above, reexamination should be ordered, and the aforementioned claim should be rendered null, void, and otherwise unenforceable in light of this reexamination request.

C. ROSSMANN IN VIEW OF FALLS RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-14

The following prior art is applied in the SNQ presented herein:

- European Patent Application EP 0779,759 to Rossmann ("Rossmann") – filed on December 11, 1996 and published on June 18, 1997 making it effective prior art under 35 U.S.C. § 102; and
- U.S. Patent No. 5,991,771 to Falls et al. ("Falls") – filed on July 3, 1997 and published November 23, 1999, making it effective prior art under 35 U.S.C. § 102.

Rossmann and Falls were never presented individually or in combination to the Office during the original prosecution. Accordingly, by teaching the limitations of the claims that the Office found missing in the prior art, this combination raises a substantial new question of patentability.

In the prosecution history, the Office found that:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. Rossmann in view of Falls teaches these limitations.

Rossmann teaches a card deck wherein each of the cards is a single operation and can be communicated to a computer from a server and from a computer to a server through any known two-way data communication network. Rossmann p. 15, lines 8-12, p. 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41. Further, since each of the cards in the card deck can be transmitted through a single operation, the connection is effectively established and terminated with each transmission. In addition, Rossmann is combined with Falls which teaches that the even though the system is disconnected from the network communications, a "virtual network" will allow the mobile device to continue normal operations. Falls at Abstract and 3:16-35. The questionnaire can then be synchronized upon reestablishing the network connection. Falls at Abstract and 3:16-35. Based on this combination, it would be obvious to a person of ordinary skill in the art to terminate and reestablish data communications between the mobile device and server of Rossmann.

After the user response data is processed at the mobile device, the cards are then transmitted to a server for collection and processing as appropriate within the system taught by Rossmann. Rossmann p. 9, lines 15-18; p. 11, line 53 – p. 12, line 2, and p. 15, lines 23-27.

The technological features found absent in the prior art were:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless

> modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. However, Rossmann in view of Falls teaches these technological features. As discussed above, Rossmann teaches a system involving a card deck wherein the server and mobile device can communicate the cards to the other device. Further, Rossmann can be combined with Falls which teaches that the mobile devices can be disconnectable from the server, and that the cards transmitted can be synchronized after a disconnection occurs. Falls at Abstract, 3:16-35, 5:21-31, and 35:47-63.

Accordingly, an Examiner would consider Rossmann in view of Falls and the knowledge of a person of ordinary skill in the art important in determining patentability as it presents the new technological feature that was found absent in the prior art and deemed important during the prosecution of the '816 patent. *See* Rossmann p. 15, lines 8-12, 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41; Falls at Abstract, 3:16-35, 5:21-31, and 35:47-63. Such an SNQ is not cumulative, as the references meet all the claim limitations for claims 1-14 and the references were not presented or discussed in combination during the prosecution of the '816 patent.

In view of the above, reexamination should be ordered, and the aforementioned claim should be rendered null, void, and otherwise unenforceable in light of this reexamination request.

D. BENIGNO IN VIEW OF FALLS RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-14

The following prior art is applied in the SNQ presented herein:

- PCT Published Application WO 99/33390 to Benigno ("Benigno") – filed on December 23, 1998 and published on July 8, 1999 making it effective prior art under 35 U.S.C. § 102; and
- U.S. Patent No. 5,991,771 to Falls et al. ("Falls") – filed on July 3, 1997 and published November 23, 1999, making it effective prior art under 35 U.S.C. § 102.

Benigno and Falls were never presented individually or in combination to the Office during the original prosecution. Accordingly, by teaching the limitations of the claims that the Office found missing in the prior art, this combination raises a substantial new question of patentability.

In the prosecution history, the Office found that:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. Benigno in view of teaches these limitations.

Benigno teaches a questionnaire based on creating a standard of care for treatment of patients that keeps nurses and doctors in constant communication. Benigno at 46:4-9 and 22-24. The nurse is able to answer questions in the questionnaire and based on the responses provided by the patient, the information is updated in the server and subsequent questions are asked. Benigno at 12:17-31. This also allows for individual questions to be used throughout multiple questionnaires, thereby increasing efficiency of the questionnaire database. *Id.* The individual questions are "tokenized representations" that are communicated between the server and the mobile device via wireless network connections. Benigno at 19:10-24, 13:1-10, and 46:4-9. The mobile device can be disconnected from the network communications due to losing the connection as is inevitable in wireless communication or due to the nurse closing the connection. Benigno at 46:4-24 and FIG.1A. Further, as shown in FIG. 1B, the modem of the system dials at the beginning of each communication step 102, 105, and 110. Dialing each time is only necessary if the modem is disconnected. The nurse can continue to input data into the questionnaire, even though the system is disconnected from the network communications, further, when combined with Falls, the combination further teaches that the questionnaire can continue to be used and a "virtual network" will allow the mobile device to continue normal operations when there is no network connection. Benigno at 46:16-28; Falls at Abstract and 3:16-35. The questionnaire can then be synchronized upon reestablishing the network connection. Benigno at FIG. 1B; Falls at Abstract and 3:16-35. The questionnaire is then stored. Benigno at 23:10. The application of this combination of references is further shown in Annotated FIG. 1A, below.

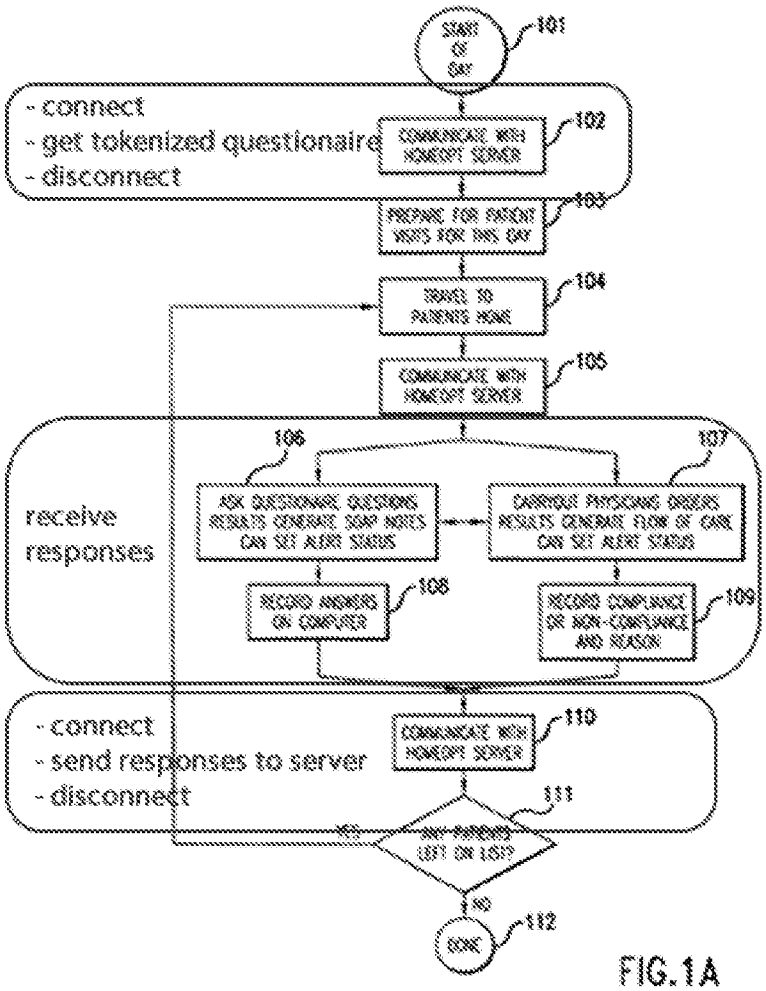


FIG.1A

As previously stated, Benigno in view of Falls teaches the technological features allegedly missing in the prior art during the original prosecution. As discussed above, Benigno teaches a questionnaire based medical communications system that communicates between mobile devices and a server. Further, Benigno can be combined with Falls which teaches that the questions are synchronized between the server and a mobile device after periods without network communications.

Accordingly, an Examiner would consider Benigno in view of Falls and the knowledge of a person of ordinary skill in the art important in determining patentability as it presents the new technological feature that was found absent in the prior art and deemed important during the prosecution of the '816 patent. *See* Benigno at 46:16-28; Falls at Abstract and 3:16-35. Such an SNQ is not cumulative, as the references meet all the claim limitations for claims 1-14 and the

references were not presented or discussed in combination during the prosecution of the '816 patent.

In view of the above, reexamination should be ordered, and the aforementioned claim should be rendered null, void, and otherwise unenforceable in light of this reexamination request.

E. BENIGNO IN VIEW OF RAPPAPORT RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1-14

The following prior art is applied in the SNQ presented herein:

- PCT Published Application WO 99/33390 to Benigno ("Benigno") – filed on December 23, 1998 and published on July 8, 1999 making it effective prior art under 35 U.S.C. § 102; and
- U.S. Patent No. 6,477,373 to Rappaport et al. ("Rappaport") – filed on August 10, 2000, claiming priority to August 10, 1999, and issued November 5, 2002, making it effective prior art under 35 U.S.C. § 102.

Benigno and Rappaport were never presented individually or in combination to the Office during the original prosecution. Accordingly, by teaching the limitations of the claims that the Office found missing in the prior art, this combination raises a substantial new question of patentability.

In the prosecution history, the Office found that:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. Benigno in view of teaches these limitations.

Benigno teaches a questionnaire based on creating a standard of care for treatment of patients that keeps nurses and doctors in constant communication. Benigno at 46:4-9 and 22-24. The nurse is able to answer questions in the questionnaire and based on the responses provided by the patient, the information is updated in the server and subsequent questions are asked.

Benigno at 12:17-31. This also allows for individual questions to be used throughout multiple questionnaires, thereby increasing efficiency of the questionnaire database. *Id* The individual questions are "tokenized representations" that are communicated between the server and the mobile device via wireless network connections. Benigno at 19:10-24, 13:1-10, and 46:4-9. The mobile device can be disconnected from the network communications due to losing the connection as is inevitable in wireless communication or due to the nurse closing the connection. Benigno at 46:4-24 and FIG.1A. Further, as shown in FIG. 1B, the modem of the system dials at the beginning of each communication step 102, 105, and 110. Dialing each time is only necessary if the modem is disconnected. The nurse can continue to input data into the questionnaire, even though the system is disconnected from the network communications. Benigno at 46:16-28. The questionnaire is then stored. Benigno at 23:10.

Furthermore, Rappaport teaches that the data can be processed while the data connection is not in use, because the mobile device continues to function "undisturbed by link failures" and "in a manner that is transparent to end users." Rappaport at 2:44-58. Accordingly, the mobile devices can continue to process data in a transparent manner, as if the data connection is still available, in anticipation of reestablishing the connection. This allows a nurse to continue to input answers to medical questions, even when the connection has failed.

The application of the combined references is further shown in Annotated FIG. 1A, below.

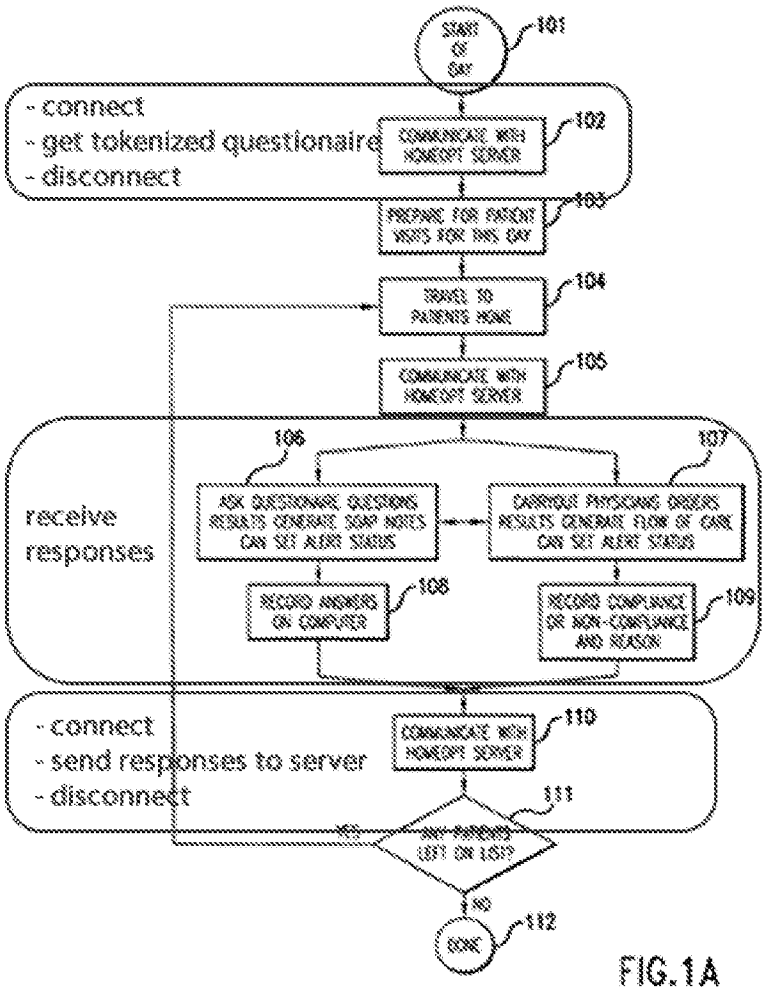


FIG.1A

As previously stated, Benigno in view of Rappaport teaches the technological features allegedly missing in the prior art during the original prosecution. As discussed above, Benigno teaches a questionnaire based medical communications system that communicates between mobile devices and a server. Further, Benigno can be combined with Rappaport which teaches that the questions can continue to be answered even when the mobile device loses network communications, since the questions can be sent to the server when the communications are restored.

Accordingly, an Examiner would consider Benigno in view of Rappaport and the knowledge of a person of ordinary skill in the art important in determining patentability as it presents the new technological feature that was found absent in the prior art and deemed important during the prosecution of the '816 patent. *See* Benigno at 46:16-28; Rappaport at 7:44-63. Such an SNQ is not cumulative, as the references meet all the claim limitations for claims 1-

14 and the references were not presented or discussed in combination during the prosecution of the '816 patent.

In view of the above, reexamination should be ordered, and the aforementioned claim should be rendered null, void, and otherwise unenforceable in light of this reexamination request.

F. WRIGHT IN VIEW OF WARTHEN, RAPPAPORT, BROOKLER , AND ROSSMANN RAISES A SUBSTANTIAL NEW QUESTION OF PATENTABILITY WITH RESPECT TO CLAIMS 1, 2, 5-7, AND 11-14

The following prior art is applied in the SNQ presented herein:

- U.S. Patent No. 5,704,029 to Wright ("Wright")-filed on May 23, 1994 and issued on December 30, 1997, making it effective prior art under 35 U.S.C. § 102.
- PA-B U.S. Patent No. 6,477,373 to Rappaport et al. ("Rappaport")-filed on August 10, 2000, claiming priority to August 10, 1999, and issued November 5, 2002, making it effective prior art under 35 U.S.C. § 102.
- PA-C U.S. Patent No. 6,584,464 to Warthen ("Warthen")-filed on March 19, 1999 and issued on June 24, 2003, making it effective prior art under 35 U.S.C. §102.
- PA-D U.S. Patent App. No. 2002/0007303 to Brookler et al. ("Brookler")-filed on April 30, 2001, claims priority to an application filed on May 1, 2000, and published on January 17, 2002, making it effective prior art under 35 U.S.C. § 102.
- European Patent Application EP 0779,759 to Rossmann ("Rossmann")-filed on December 11, 1996 and published on June 18, 1997 making it effective prior art under 35 U.S.C. § 102

Wright, Rappaport, Warthen, Brookler, and Rossmann were never presented individually or in combination to the Office during the original prosecution. Accordingly, by teaching the limitations of the claims that the Office found missing in the prior art, this combination raises a substantial new question of patentability.

In the prosecution history, the Office found that:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the

> user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3 Wright in view of Rappaport, Warthen, and Brookler teaches these limitations.

Wright and Warthen teach a system that creates a questionnaire and tokenizes that data of that questionnaire. Wright at ABSTRACT and 13:38-67; Warthen at ABSTRACT and 2:1-11. Rappaport then teaches that the systems taught by Wright and Warthen are both able to establish two-way communications between the mobile device and the server. Rappaport at Abstract and 16:30-36. Further, Rappaport teaches that the number of channels available for cellular sessions is limited, and data transfers can be interrupted (i.e., terminated) to allow for real-time communication. Rappaport at 7:44-63. Rappaport also teaches that the data can be processed while the data connection is not in use, because the mobile device continues to function "undisturbed by link failures" and "in a manner that is transparent to end users." Rappaport at 2:44-58. Accordingly, the mobile devices can continue to process data in a transparent manner, as if the data connection is still available, in anticipation of reestablishing the connection. Finally, Brookler teaches that the tokenized data can be transmitted using multiple network connections, and processed at the server. Brookler at [0033] and FIG. 1.

Also, Rossmann is added to teach that the system described by the above combination can include a step where a report can be printed. Rossmann p. 11, lines 4-8

The technological features found absent in the prior art were:

> The cited prior arts [sic] fail to disclose or suggest transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection, terminating said first wireless modem or wireless LAN network connection with said remote computing device, after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user, establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server, after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection in conjunction with all other limitations in the claim.

See Notice of Allowance issued September 7, 2010 at 2-3. However, Wright in view of Rappaport, Warthen, and Brookler teaches these technological features. As discussed above, Wright in view of Rappaport, Warthen, and Brookler teaches a system involving a tokenized

questionnaire wherein the server and mobile device can communicate the data to the other device. Further, Rappaport teaches that the data are transmitted between the server and a mobile device.

Accordingly, an Examiner would consider Wright in view of Rappaport, Warthen, and Brookler and the knowledge of a person of ordinary skill in the art important in determining patentability as it presents the new technological feature that was found absent in the prior art and deemed important during the prosecution of the '816 patent. *See* Wright at ABSTRACT and 13:38-67; Warthen at ABSTRACT and 2:1-11; Rappaport at 7:44-63 and 16:30-36; and Brookler at [0033] and FIG. 1. Such an SNQ is not cumulative, as the references meet all the claim limitations for claims 1, 2, 5-7, and 11-14 and the references were not presented or discussed in combination during the prosecution of the '816 patent.

In view of the above, reexamination should be ordered, and the aforementioned claim should be rendered null, void, and otherwise unenforceable in light of this reexamination request.

V. MANNER OF APPLYING THE CLAIMS AS REQUIRED BY 37 C.F.R. § 1.510 (B)(2)

A. CLAIMS 1-3 AND 5-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY ROSSMANN IN VIEW OF RAPPAPORT AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

Please see the below claim chart that applies the teachings of Rossmann in view of Rappaport to claims 1-3 and 5-14 of the '816 patent.

Reasons to Combine:

A person of ordinary skill in the art would recognize that Rossmann teaches that a mobile device that connects to a server and transmits information between the two devices. *See* Rossmann p. 6, lines 31-37 and 14, lines 35-38. It would have been obvious to combine Rossmann with Rappaport so that when a connection fails, as will predictably happen, the device can reconnect and send the information upon reconnection. This would motivate a person of skill in the art to make the combination since disconnections are a common occurrence and Rappaport teaches a method of reconnection. *See* Rappaport at Abstract.

Brief Description of Application within Charts Below:

Rossmann teaches a card deck wherein each of the cards is a single operation and is a representation of a question in a questionnaire, this is tokenization within the broadest reasonable interpretation of the claims of the '816 patent. Rossmann, p. 10, lines 38-48, 11, lines 15-16, 14,

lines 55-58, 15, lines 2-7, and 15, lines 56-57. These tokens, i.e., cards, can be communicated to a computer from a server and from a computer to a server through any known two-way data communication network. Rossmann p. 15, lines 8-12, p. 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41. The method described by Rossmann can be supplemented by the addition of Rappaport, which teaches that mobile devices can terminate and reestablish connections. Rappaport at 7:44-63. Accordingly, the cards and card decks can be communicated between a mobile device and a server.

As will be appreciated with reference to the citations contained in the charts below, each of the claim limitations is explicitly taught by the combination of Rossmann and Rappaport. Accordingly, the rejections should be adopted.

CLAIM 1	**Teachings of Rossmann in view of Rappaport**
1. A method for managing data including the steps of:	As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. Rossmann p. 4, lines 1-9
(a) creating a questionnaire comprising a series of questions;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card

	deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150.

The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209.

Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105.

After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F.
Rossmann, p. 10, lines 38-48

In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.**
Rossmann p. 11, lines 15-16

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression.
Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a

	common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(c) establishing a first wireless modem or wireless LAN network connection with a remote computing device;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38
(d) transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a

	binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7
(e) terminating said first wireless modem or wireless LAN network connection with said remote computing device;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

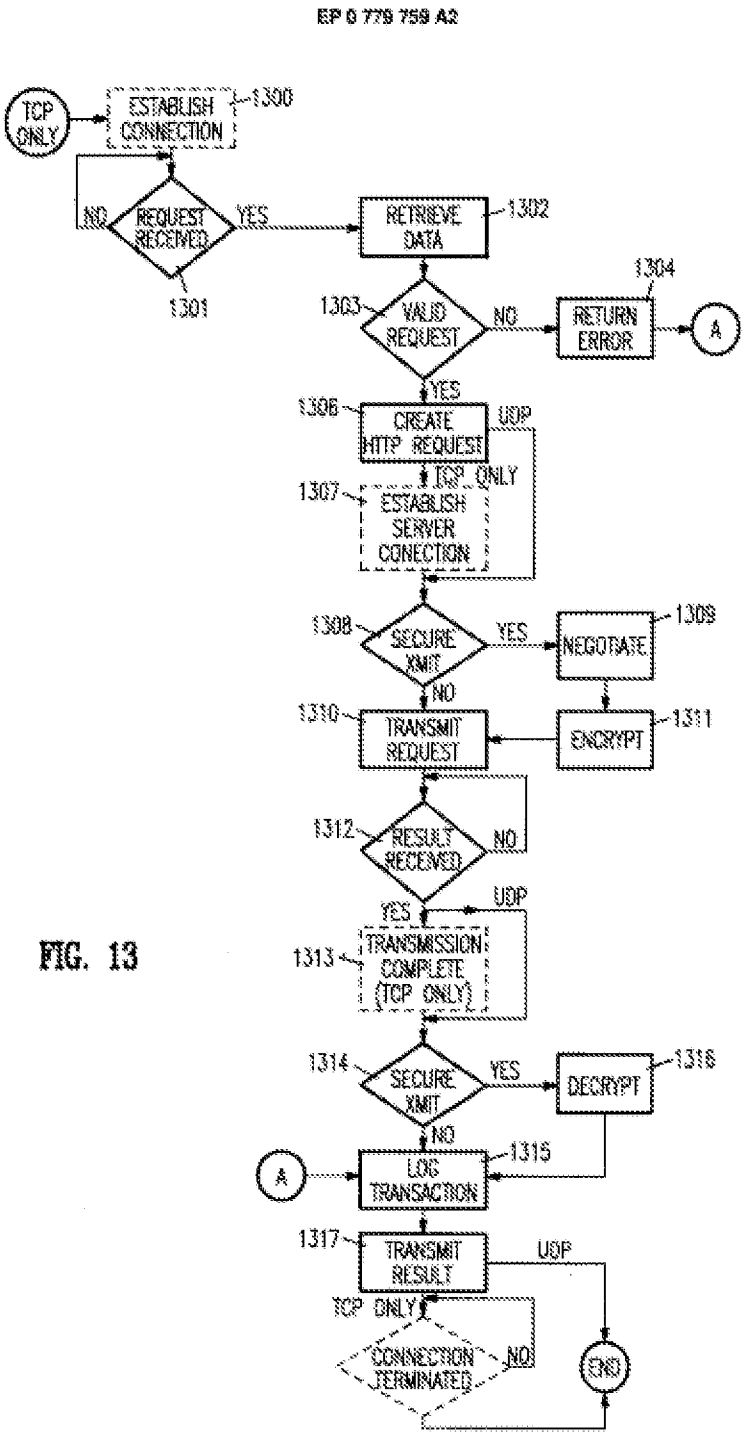


FIG. 13

Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources.

	Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport col. 7, lines 44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport col. 2, lines 44-58
(f) after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301, the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205. When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal

	information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and voice messages waiting for the user. Rossmann p. 11, lines 43-52
(g) establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38
(h) after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection; and	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network

	130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(i) storing said transmitted response at said server.	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which **stores** the response in a memory. Rossmann p. 4, lines 5-7 When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 47-52 Computer 743 may contain **stored** static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or choices made by, the user of cellular telephone 700. Rossmann p. 15, lines 13-15
CLAIM 2	
2. The method for managing data of	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display

claim 1 further comprising the step of: (j) translating said response to a format recognizable by a particular computer program; and	card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by **interpreting** the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 43-48
(k) accessing the translated response from a computer executing said particular computer program.	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by **interpreting** the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 43-48

CLAIM 3	
3. The method for managing data of claim 1 wherein step (a) includes the substeps of: (a) creating a questionnaire by:	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one

	action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(i) entering a series of questions into a questionnaire design computer program;	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs.

	Rossmann p. 9, lines 15-18
(ii) identifying within said questionnaire design computer program the type of response allowed for each question of said series of questions; and	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource allocator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer. Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server computer, the client module provides the message to the network interface module which in turn transmits the message over the two-way data communication network. Rossmann p. 4, lines 15-21 An important aspect of this invention is that the message includes all information necessary for the client module to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces and possible interactions available to the user are determined only by the applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform.

	Rossmann at p. 4, lines 29-35 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18
(iii) identifying within said questionnaire design computer program a branching path in said questionnaire for each possible response to each question of said series of questions.	In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8
CLAIM 5	
5. A method for modifying a questionnaire used in	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on

data management according to the method of claim 1 including the steps of: (a) making at least one incremental change to a portion of the questionnaire;	the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51
(b) tokenizing said at least one incremental change to said questionnaire;	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(c) transmitting at least a portion of said tokens resulting from step (b) to a remote loosely networked computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(d) incorporating said transmitted tokens into said questionnaire at said loosely networked remote computing	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of

device, thereby modifying said questionnaire.	application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
CLAIM 6	
6. A method for managing data according to claim 1, wherein said first wireless modem or wireless LAN network connection and said second wireless modem or wireless LAN network connection are a same wireless modem or wireless LAN network connection.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 7	
7. The method of claim 1 further including performing at least the steps (c)-(k) for at least two different remote computing device	Each wireless communication device 100 that includes this invention can communicate over airnet network 150 with any server computer 121, 131, and 141 on airnet network 150 that includes at least one application that communicates and interacts with the processes of this invention that are included within device 100. Thus, device 100 can access information on the computer network and provide information to the computer network. Similarly, a two-way pager 101, and a telephone

types using the same tokens.	102 with a modem 103, that each include this invention, can communicate over airnet network 150 with any of server computers 121, 131, and 141 that includes at least one application that communicates and interacts with the processes of this invention that are included within devices 101 and 102. Rossmann p. 6, lines 38-44
CLAIM 8	
8. A method for managing data transfers between computers including the steps of:	As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. Rossmann p. 4, lines 1-9
(a) creating a questionnaire at a first site in a first computer;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a

	resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(b) tokenizing said questionnaire, thereby producing a tokenized questionnaire;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105.

After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F.
Rossmann, p. 10, lines 38-48

In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.**
Rossmann p. 11, lines 15-16

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression.
Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common
gateway interface application builds a PIDL deck that includes the data in the response to the stock query.

The interface presented in Table 7 for TIL manager module 1403 is

	designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(c) bringing a remote computer into electronic communication with said first computer;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38
(d) transmitting said tokenized questionnaire to said remote computer;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a

	screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7
(e) removing said remote computer from electronic communication with said first computer;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

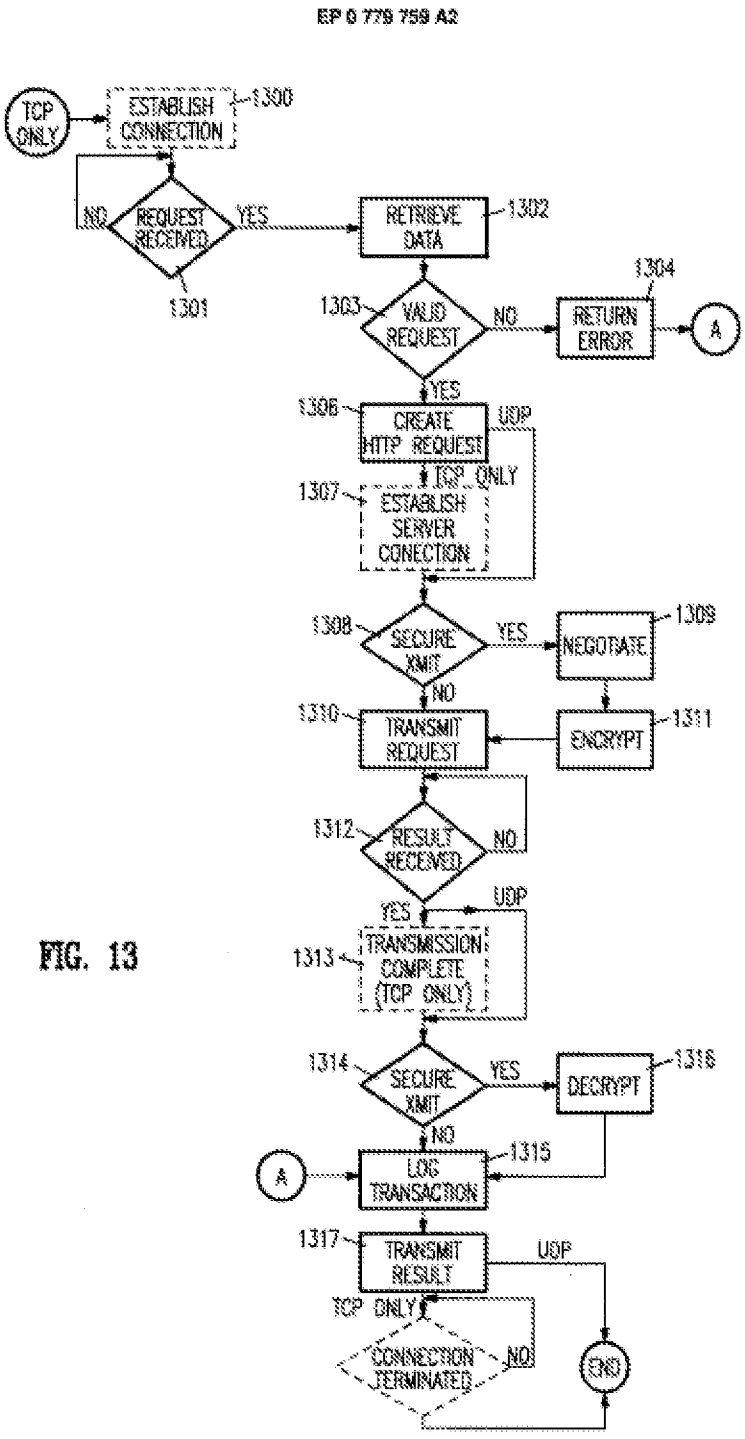


FIG. 13

Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources.

	Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(f) within said remote computer, using said transmitted tokenized questionnaire to obtain at least one user response;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301, the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205. When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal

	information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and voice messages waiting for the user. Rossmann p. 11, lines 43-52
(g) storing said at least one user response within said remote computer;	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource allocator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer. Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server computer, the client module provides the message to the network interface module which in turn transmits the message over the two-way data communication network. Rossmann p. 4, lines 15-21 An important aspect of this invention is that the message includes all information necessary for the client module to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces and possible interactions available to the user are determined only by the

	applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform. Rossmann at p. 4, lines 29-35 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18
(h) modifying said questionnaire with incremental changes at a second computer located at a second site;	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51
(i) placing said remote computer into electrical communication with said second computer;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely

	below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38
(j) transmitting said incremental changes from said second computer to said remote computer;	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a

	listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(k) modifying said transmitted tokenized questionnaire in said remote computer with said incremental changes, thereby creating a modified tokenized questionnaire;	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(l) removing said remote computer from electronic communication with said second computer;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38

	After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

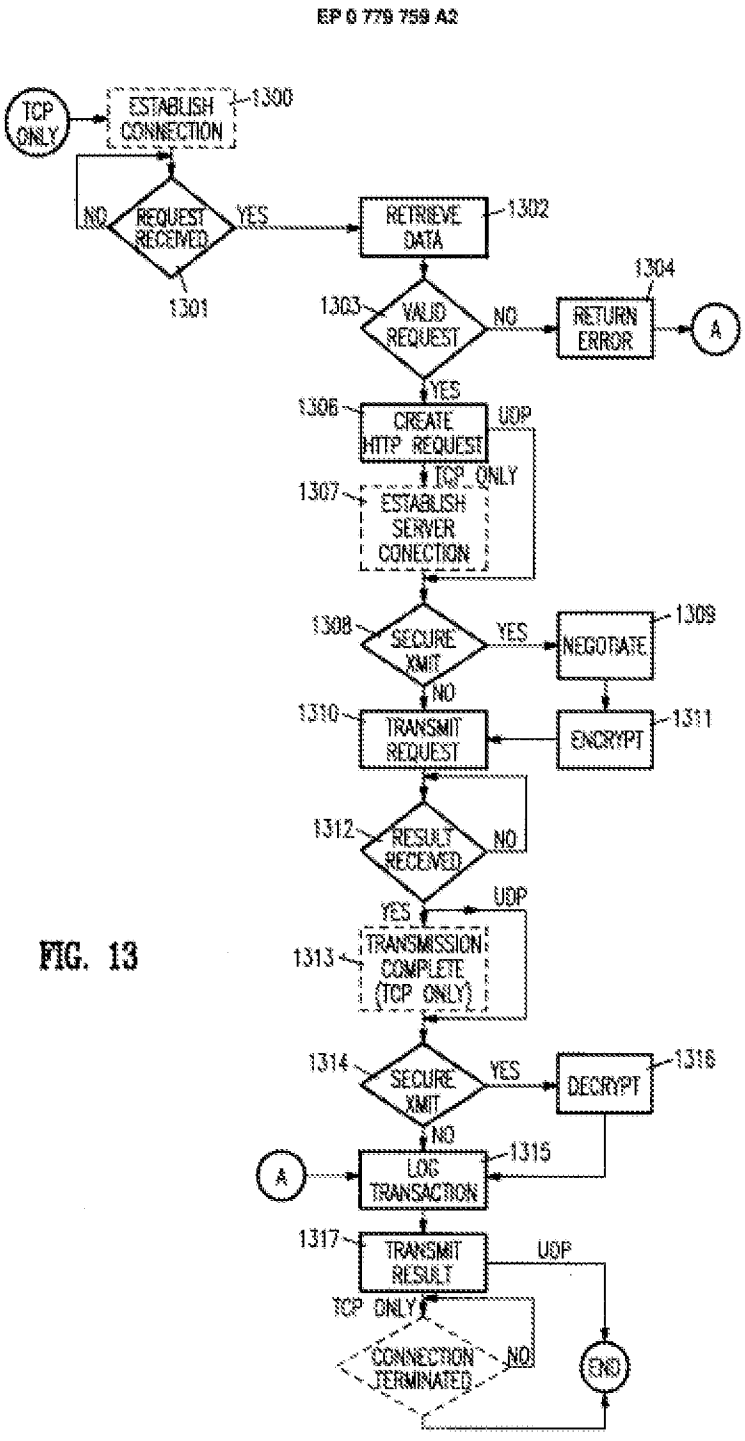


FIG. 13

Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources.

	Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(m) within said remote computer, using said modified tokenized questionnaire to obtain at least one additional user response;	When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource allocator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer. Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server computer, the client module provides the message to the network interface module which in turn transmits the message over the two-way data communication network. Rossmann p. 4, lines 15-21 An important aspect of this invention is that the message includes all information necessary for the client module to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces

	and possible interactions available to the user are determined only by the applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform. Rossmann at p. 4, lines 29-35 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8
(n) placing said remote computer into electronic communication with a server;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38

(o) transmitting said at least one user response to said server;	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(p) transmitting said at least one additional user response to said server;	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not

	highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(q) storing said transmitted at least one user response and said at least one additional user response at said server;	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which **stores** the response in a memory. Rossmann p. 4, lines 5-7 When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 47-52 Computer 743 may contain **stored** static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or

	choices made by, the user of cellular telephone 700. Rossmann p. 15, lines 13-15
(r) preparing a report using any of said at least one user response and said at least one additional user response; and,	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 When server computer 121 receives the information, server computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, converts the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to

	2H, for example. Rossmann p. 15, lines 23-27
(s) displaying at least a portion of said report on a visually perceptible medium;	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 When server computer 121 receives the information, server computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, converts the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example.

	Rossmann p. 15, lines 23-27
(t) performing at least steps (d)-(p) using at least two different remote computing device types using the same tokens.	Each wireless communication device 100 that includes this invention can communicate over airnet network 150 with any server computer 121, 131, and 141 on airnet network 150 that includes at least one application that communicates and interacts with the processes of this invention that are included within device 100. Thus, device 100 can access information on the computer network and provide information to the computer network. Similarly, a two-way pager 101, and a telephone 102 with a modem 103, that each include this invention, can communicate over airnet network 150 with any of server computers 121, 131, and 141 that includes at least one application that communicates and interacts with the processes of this invention that are included within devices 101 and 102. Rossmann p. 6, lines 38-44
CLAIM 9	
9. The method for managing data transfers between computers according to claim 8 wherein said first computer and said second computer are a same computer.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 10	
10. The method for managing data transfers between computers according to claim 9 wherein said server and said first computer are said same computer.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 11	

11. A method for collecting survey data from a user comprising the steps of:	As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. Rossmann p. 4, lines 1-9
(a) creating a questionnaire comprising a series of questions;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display

	209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 38-48 In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user**

	interfaces as illustrated in Figures 2A to 2H. Rossmann p. 11, lines 15-16 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7 For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(c) storing said plurality of tokens on a computer readable medium on a first	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator

computer;	to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 38-48 In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.** Rossmann p. 11, lines 15-16 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7
(d) placing a handheld remote computing device into electronic communication with	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer

said first computer;	networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38
(e) transmitting said plurality of tokens to said handheld remote computing device;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7

(f) taking said handheld remote computing device out of electronic communication with said first computer;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

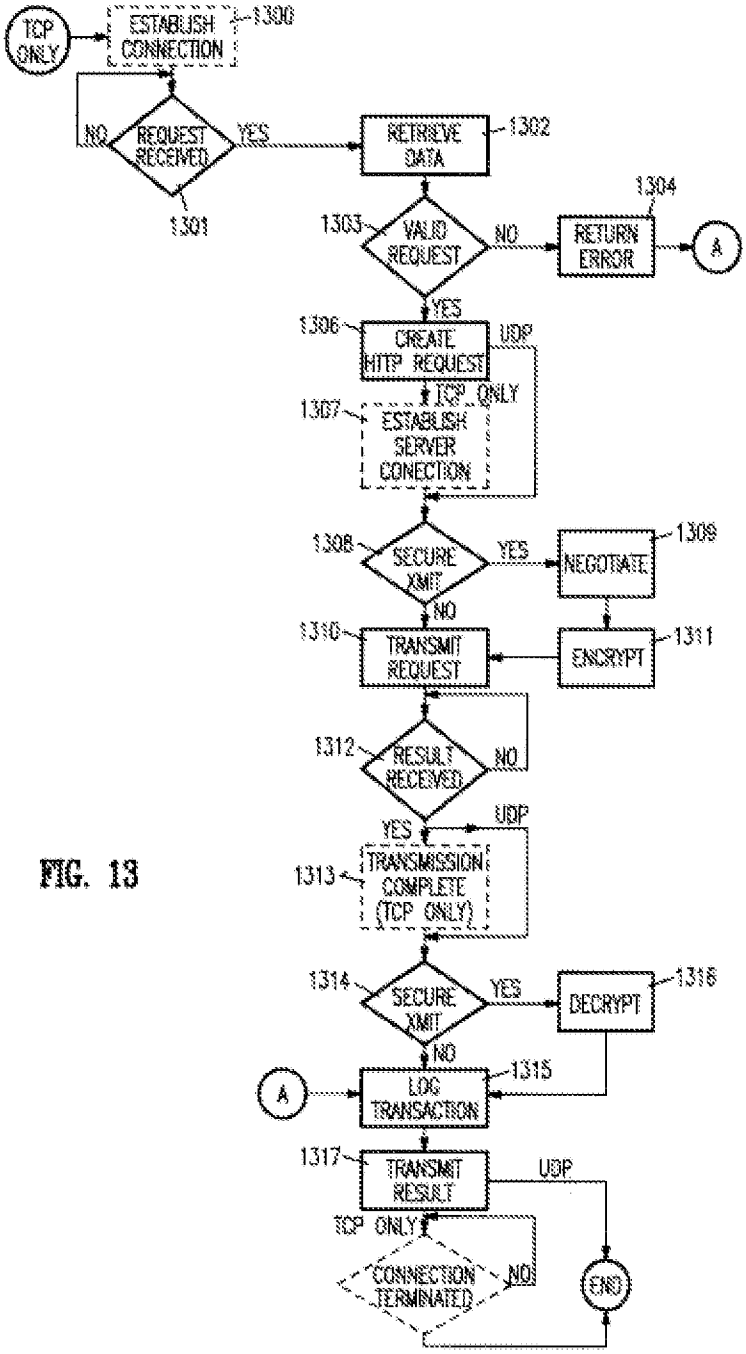


FIG. 13

Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority

	over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(g) after said handheld remote computing device has been taken out of electronic communication with said first computer,	After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41
(g1) executing at least a portion of said plurality of tokens representing said questionnaire on said handheld remote computing device to	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller.

collect a response from a user, and,	Rossmann p. 15, lines 8-12 The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301 , the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205. When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 43-52
(g2) storing within said remote computing device said response from the user;	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which **stores** the response in a memory. Rossmann p. 4, lines 5-7 When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 47-52 Computer 743 may contain **stored** static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or choices made by, the user of cellular telephone 700. Rossmann p. 15, lines 13-15
(h) placing said handheld remote computing device into	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices

electronic communication with a second computer;	100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38
(i) transmitting at least a portion of said response stored within said handheld remote computing device to said second computer; and,	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of

	cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(j) forming a visually perceptible report from any of said at least a portion of said response so transmitted.	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 When *server* computer 121 receives the information, *server* computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, *converts* the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD

	network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
CLAIM 12	
12. A method for collecting survey data from a user according to claim 11, wherein step (j) comprises the step of printing a report from any of said response to transmitted.	When *server* computer 121 receives the information, *server* computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, *converts* the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8
CLAIM 13	
13. A method for collecting survey data from a user according to claim 11, wherein said first computer and said second computer are a same computer.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 14	
14. A method for modifying a questionnaire used in data management according to the method of claim 11, further comprising the steps of: (k) making at least one incremental change to a portion of said questionnaire;	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51

(l) tokenizing said at least one incremental change to said questionnaire;	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(m) transmitting at least a portion of said tokens resulting from step (k) to said remote handheld computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(n) incorporating said transmitted tokens into said questionnaire at said remote computing device, thereby incrementally changing said questionnaire.	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager.

	From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-434

B. CLAIM 4 OF THE '816 PATENT ARE RENDERED OBVIOUS BY ROSSMANN IN VIEW OF RAPPAPORT, BOWEN, AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

Please see the below claim chart that applies the teachings of Rossmann in view of Rappaport and Bowen to claim 4 of the '816 patent.

Reasons to Combine:

A person of ordinary skill in the art would recognize that Rossmann teaches that a mobile device that connects to a server and transmits information between the two devices. *See* Rossmann p. 6, lines 31-37 and 14, lines 35-38. It would have been obvious to combine Rossmann with Rappaport so that when a connection fails, as will predictably happen, the device can reconnect and send the information upon reconnection. This would motivate a person of skill in the art to make the combination since disconnections are a common occurrence and Rappaport teaches a method of reconnection. *See* Rappaport at Abstract. Further, Bowen teaches that the hierarchical structure of a questionnaire can be beneficial for recording user responses. Bowen at Abstract.

Brief Description of Application within Charts Below:

Rossmann teaches a card deck wherein each of the cards is a single operation and is a representation of a question in a questionnaire, this is tokenization within the broadest reasonable interpretation of the claims of the '816 patent. Rossmann, p. 10, lines 38-48, 11, lines 15-16, 14, lines 55-58, 15, lines 2-7, and 15, lines 56-57. These tokens, i.e., cards, can be communicated to a computer from a server and from a computer to a server through any known two-way data communication network. Rossmann p. 15, lines 8-12, p. 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41. The method described by Rossmann can be supplemented by the addition of Rappaport, which teaches that mobile devices can terminate and reestablish connections.

Rappaport at 7:44-63. Accordingly, the cards and card decks can be communicated between a mobile device and a server. Further, Bowen teaches that the hierarchical structure of a questionnaire can be beneficial for recording user responses. Bowen at Abstract.

As will be appreciated with reference to the citations contained in the charts below, each of the claim limitations is explicitly taught by the combination of Rossmann, Rappaport, and Bowen. Accordingly, the rejections should be adopted.

CLAIM 4	Teachings from Rossmann in view of Rappaport and Bowen
4. The method for managing data of claim 1 wherein step (b) includes the substeps of: (b) tokenizing said questionnaire thereby producing a plurality of tokens representing said questionnaire by:	In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key

	sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann, p. 10, lines 38-48 In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.** Rossmann p. 11, lines 15-16 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7 For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I.

	Rossmann p. 15, lines 56-57
(i) assigning at least one token to each question of said series of questions;	Specifically, the application accessed on server computer 121 generates the card deck and so in turn defines each of the various user interfaces. Each user interface permits the user to identify a particular selection. Each particular selection could result in generation of a different user interface with different selections. Thus, the user interfaces are limited only by the applications accessible to the two-way data communication device. Rossmann p. 11, lines 21-24 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8
(ii) assigning at least one token to each response called for in said series of questions to identify the type of response required; and	The home key is associated with a pointer, that in one embodiment is a resource locator, and the card addressed by the pointer is displayed by the client process when the home key is selected by the user. Specifically, if the pointer is to a card in the current deck, the client process simply displays that card. If the pointer is to other than a card in the current deck, the client process in cellular telephone 100 retrieves the deck containing the card at the location identified by the pointer. The location could be, for example, either a memory in cellular telephone 100, or a memory in computer 121. Rossmann p. 9, line 59-p. 10, line 5 Specifically, the application accessed on server computer 121 generates the card deck and so in turn defines each of the various user interfaces. Each user interface permits the user to identify a particular selection. Each particular selection could result in generation of a different user interface with different selections. Thus, the user interfaces are limited only by the applications accessible to the two-way data communication device.

	Rossmann p. 11, lines 21-24
(iii) assigning at least one token to each branch in said questionnaire to identify the required program control associated with said branch.	The client process in cellular telephone 100 interprets the first card in the card deck from computer 141 and generates screen display 400 (Fig. 4A). When the user presses a predetermined key, cellular telephone 100 displays screen display 401 (Fig. 4B). Screen display 401 provides the user with a series of choices that group services alphabetically. When the user depresses the seven key on the keypad of cellular telephone 100, cellular telephone 100 displays a list of the services that have letters P, R, or S as the first letter in the service name. In this embodiment, screen displays 401 and 402 are a single card, e.g., a single screen. Each of the various services associated with a key has an index and when a particular choice is made by the user, the choice defines an index. The client process then displays all of the services with the index that corresponds to the index defined by the user's choice. In screen display 402, the user is given a series of choices of services that are available to the user under tab seven. Initially, item three in screen display 402 is not highlighted. In this example, the user depresses the three key on the keypad of cellular telephone 100 to select the stock quotes and item three in screen display 402 is highlighted. In response to this selection, cellular telephone 100 transmits a request for a stock quote, i.e., a message including a resource locator, over cellular telephone network 100 and internet 140 to service provider 141. In response to the request, service provider computer 141 executes the application addressed by the resource locator. The application retrieves a card deck that, in turn is transmitted to cellular telephone 100. The card deck includes a display card and an entry card. Upon receiving the card deck, the client process in cellular telephone 100 interprets the display card and generates screen display 403 (Fig. 40). When the user depresses a predetermined key, entry screen display 406 (Fig. 4E) is generated on display screen 105 of cellular telephone 100. Initially, the box with letters SUNW in screen display 406 is empty. The letters SUNW are entered in the box by the user to indicate the ticker symbol of the stock for which the user wants information. After the user has entered the stock ticker symbol, the user presses the predetermined key to indicate that the entry is complete. In response to the entry by the user, the client module appends the stock ticker symbol to the resource locator and transmits the resource locator

	to service provider computer 141 which, in turn, executes an application addressed by the resource locator to retrieve the latest stock market information for the stock ticker symbol. Service provider 141 uses the retrieved information to generate a card deck that contains the information and then transmits the card deck to cellular telephone 100. Rossmann p. 12, lines 25-52 The method for creating a hierarchical data tree of the present invention includes the initial step of providing a computer information processing system with a user interface, a data base and a system of rules which governs the interaction between the interface and the data base and determines a method of building a structured record of the interaction referred to as a hierarchical data tree. The user initially designates a target field and a next record field and the system searches the data base for records which have a source field matching the designated target field. The next record field of each record determines interaction with records matching the displayed record's target field. If a response is expected from the user, the user may either accept the record displayed or provide a separate user response as a selection. If no response is expected, according to the next record field, the system automatically selects the first matching record found. The system records the selection, whether from the system or from the user, utilizing a block of computer memory. The system then utilizes the recorded node as the basis for further search and further interaction. The system first creates a vertical leg of the data tree, before creating horizontal branches, according to the rules of interaction. Bowen col. 1, line 46- col. 2, line 2

C. CLAIMS 1 -14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY ROSSMANN IN VIEW OF FALLS AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

Please see the below claim chart that applies the teachings of Rossmann in view of Falls to claims 1-14 of the '816 patent.

Reasons to Combine:

A person of ordinary skill in the art would recognize that Rossmann teaches that a mobile device that connects to a server and transmits information between the two devices. *See* Rossmann p. 6, lines 31-37 and 14, lines 35-38. It would have been obvious to combine Rossmann with Falls so that when a connection fails, as will predictably happen, the device can reconnect and send the information upon reconnection. This would motivate a person of skill in the art to make the combination since disconnections are a common occurrence and Falls teaches

a method of synchronization upon reconnection of a mobile device to the network and server. *See* Falls at Abstract.

Brief Description of Application within Charts Below:

Rossmann teaches a card deck wherein each of the cards is a single operation and is a representation of a question in a questionnaire, this is tokenization within the broadest reasonable interpretation of the claims of the '816 patent. Rossmann, p. 10, lines 38-48, 11, lines 15-16, 14, lines 55-58, 15, lines 2-7, and 15, lines 56-57. These tokens, i.e., cards, can be communicated to a computer from a server and from a computer to a server through any known two-way data communication network. Rossmann p. 15, lines 8-12, p. 14, lines 35-38, p. 26, lines 5-6, and p. 28, lines 39-41. The method described by Rossmann can be supplemented by the addition of Falls, which teaches that mobile devices can terminate and reestablish connections. Falls at 3:16-35, 16:24-29, and 7:16-21. Accordingly, the cards and card decks can be communicated between a mobile device and a server.

As will be appreciated with reference to the citations contained in the charts below, each of the claim limitations is explicitly taught by the combination of Rossmann and Falls. Accordingly, the rejections should be adopted.

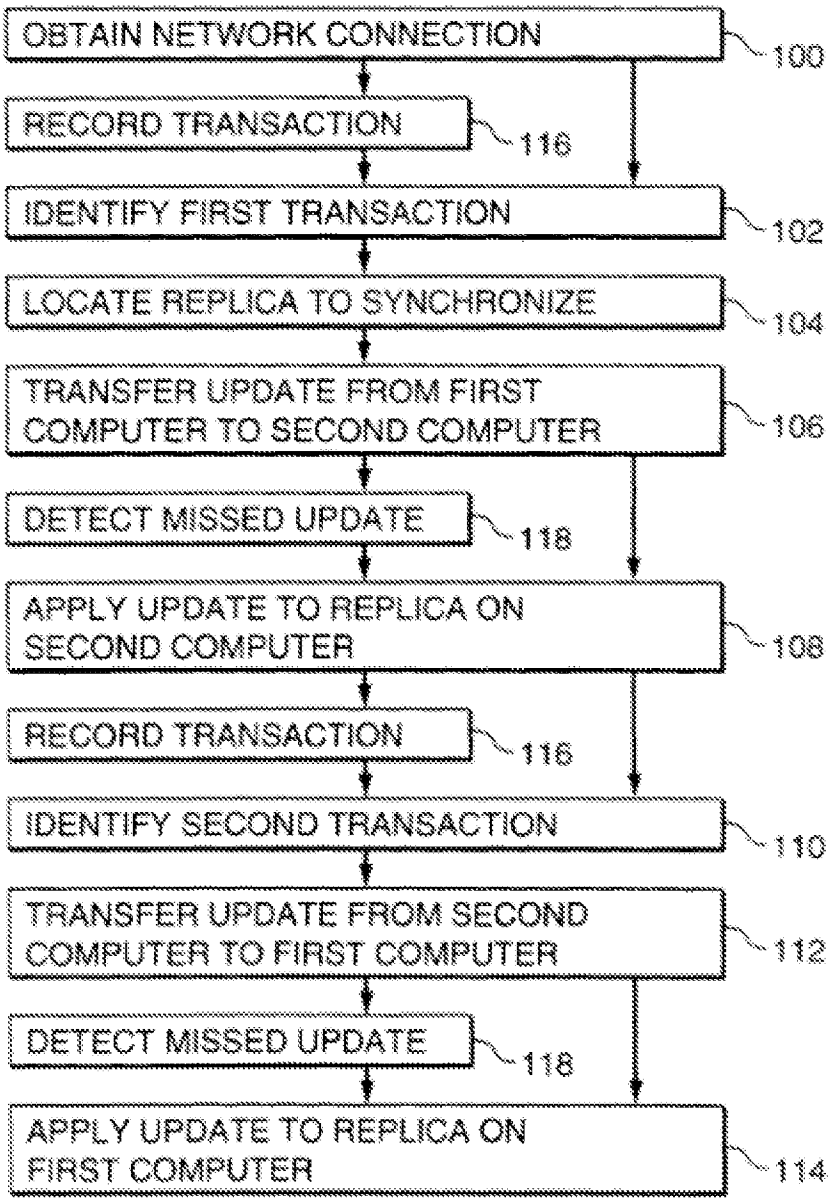
CLAIM 1	**Rossmann in view of Falls**
1. A method for managing data including the steps of:	As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. Rossmann p. 4, lines 1-9
(a) creating a questionnaire comprising a series of	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen

questions;	display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12

(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann, p. 10, lines 38-48 In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.** Rossmann p. 11, lines 15-16 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.

	Rossmann p. 15, lines 2-7 For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(c) establishing a first wireless modem or wireless LAN network connection with a remote computing device;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other

	computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29

	 *FIG. 4*
(d) transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.
Falls at Abstract

The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does

	not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(e) terminating said first wireless modem or wireless LAN network connection with said remote computing device;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38

	After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

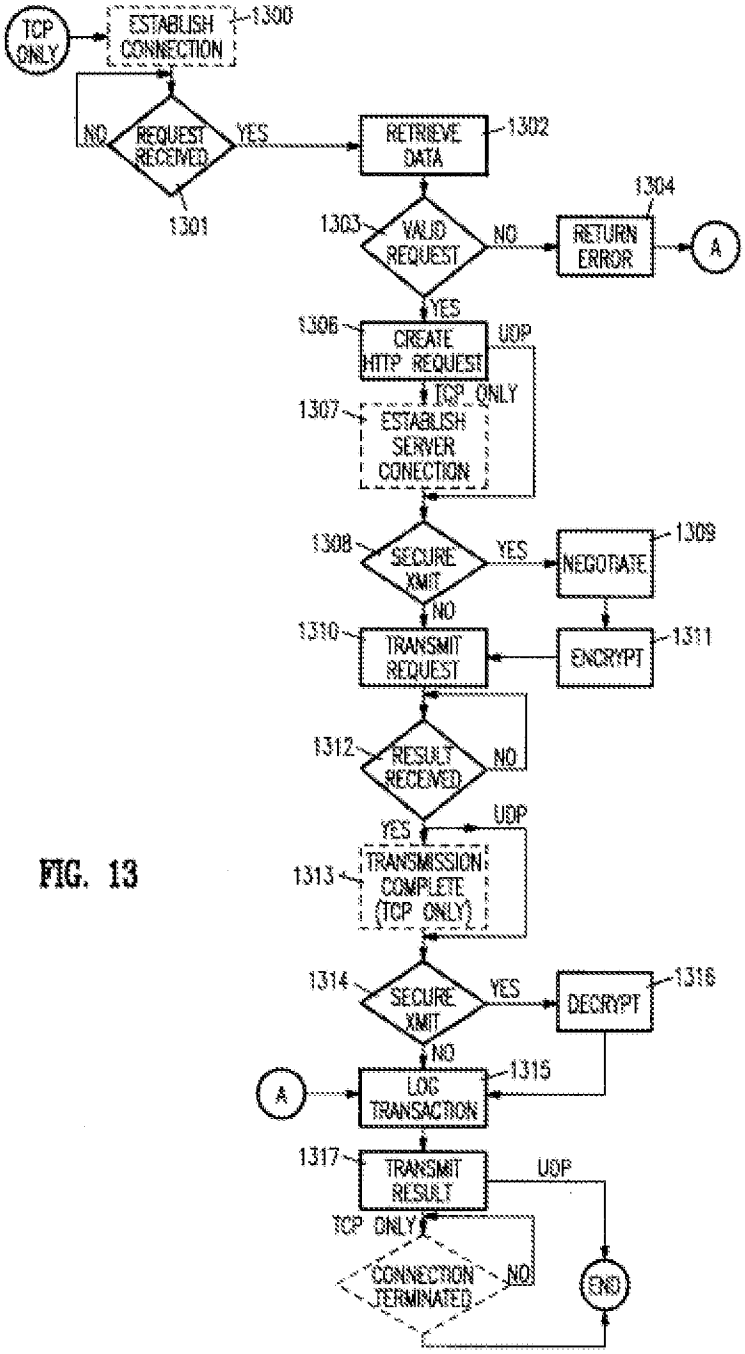


FIG. 13

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to

	the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29 With reference to FIG. 2, at least two of the computers 28 are disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-21
(f) after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller.

tokens representing said questionnaire at said remote computing device to collect a response from a user;	Rossmann p. 15, lines 8-12 The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301, the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205. When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and voice messages waiting for the user. Rossmann p. 11, lines 43-52 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does

	not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(g) establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular

	telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14

	In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and disconnectability. Falls at 7:53-8:1. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains convergently consistent replicas 56 residing on separate computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention. 35:47-63

	In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

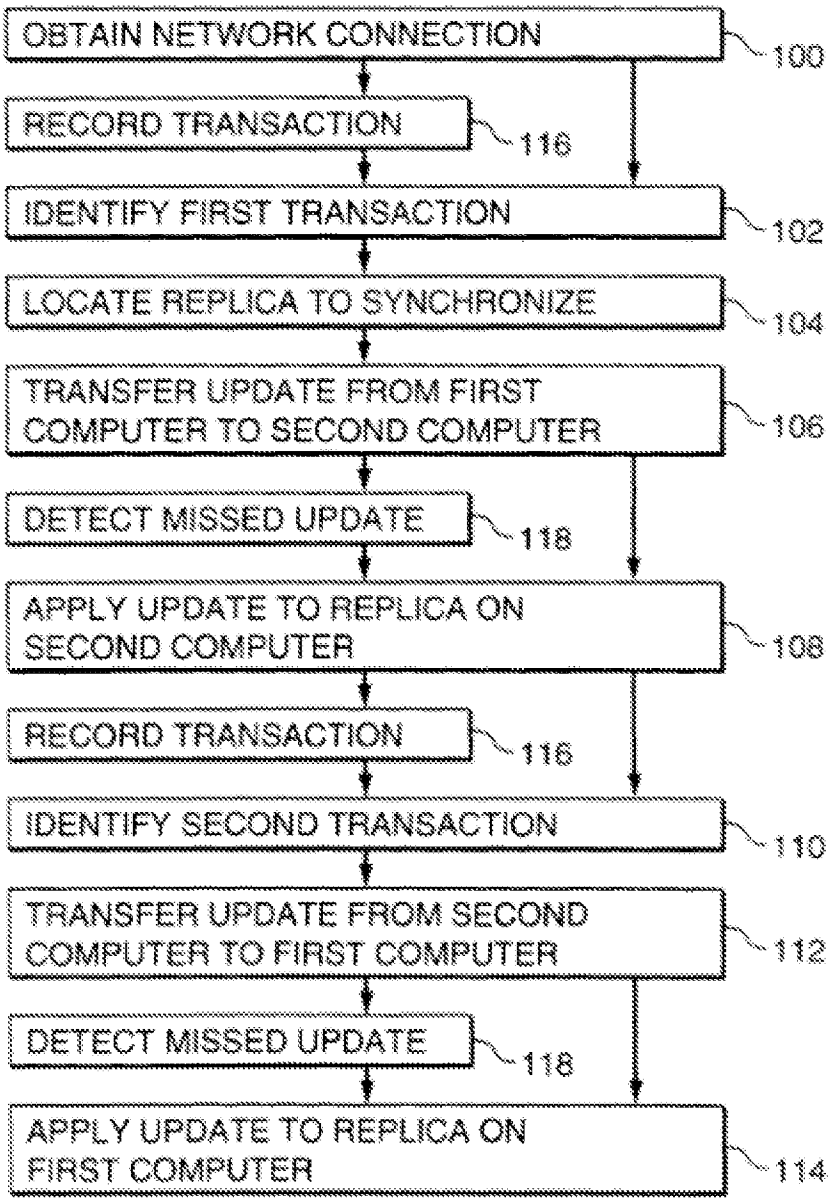


FIG. 4

(h) after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18

said second wireless modem or wireless LAN network connection; and	The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use

	and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(i) storing said transmitted response at said server.	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which **stores** the response in a memory. Rossmann p. 4, lines 5-7

	When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 47-52 Computer 743 may contain **stored** static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or choices made by, the user of cellular telephone 700. Rossmann p. 15, lines 13-15
CLAIM 2	
2. The method for managing data of claim 1 further comprising the step of: (j) translating said response to a format recognizable by a particular computer program; and	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by **interpreting** the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 43-48
(k) accessing the translated response from a computer executing said	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process

particular computer program.	in cellular telephone 100 by **interpreting** the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 43-48
CLAIM 3	
3. The method for managing data of claim 1 wherein step (a) includes the substeps of: (a) creating a questionnaire by:	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the

	purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(i) entering a series of questions into a questionnaire design computer program;	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone

	network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18
(ii) identifying within said questionnaire design computer program the type of response allowed for each question of said series of questions; and	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource allocator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer.

	Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server computer, the client module provides the message to the network interface module which in turn transmits the message over the two-way data communication network. Rossmann p. 4, lines 15-21 An important aspect of this invention is that the message includes all information necessary for the client module to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces and possible interactions available to the user are determined only by the applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform. Rossmann at p. 4, lines 29-35 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18

(iii) identifying within said questionnaire design computer program a branching path in said questionnaire for each possible response to each question of said series of questions.	In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8
CLAIM 4	
4. The method for managing data of claim 1 wherein step (b) includes the substeps of: (b) tokenizing said questionnaire thereby producing a plurality of tokens representing said questionnaire by:	In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209.

Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105.

After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F.
Rossmann, p. 10, lines 38-48

In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.**
Rossmann p. 11, lines 15-16

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression.
Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received,

	the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(i) assigning at least one token to each question of said series of questions;	Specifically, the application accessed on server computer 121 generates the card deck and so in turn defines each of the various user interfaces. Each user interface permits the user to identify a particular selection. Each particular selection could result in generation of a different user interface with different selections. Thus, the user interfaces are limited only by the applications accessible to the two-way data communication device. Rossmann p. 11, lines 21-24 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8
(ii) assigning at least one token to each response called for in said series of questions to identify the type of response required; and	The home key is associated with a pointer, that in one embodiment is a resource locator, and the card addressed by the pointer is displayed by the client process when the home key is selected by the user. Specifically, if the pointer is to a card in the current deck, the client process simply displays that card. If the pointer is to other than a card in the current deck, the client process in cellular telephone 100 retrieves the deck containing the card at the location identified by the pointer. The location could be, for example, either a memory in cellular telephone 100, or a memory in computer 121. Rossmann p. 9, line 59-p. 10, line 5

	Specifically, the application accessed on server computer 121 generates the card deck and so in turn defines each of the various user interfaces. Each user interface permits the user to identify a particular selection. Each particular selection could result in generation of a different user interface with different selections. Thus, the user interfaces are limited only by the applications accessible to the two-way data communication device. Rossmann p. 11, lines 21-24
(iii) assigning at least one token to each branch in said questionnaire to identify the required program control associated with said branch.	The client process in cellular telephone 100 interprets the first card in the card deck from computer 141 and generates screen display 400 (Fig. 4A). When the user presses a predetermined key, cellular telephone 100 displays screen display 401 (Fig. 4B). Screen display 401 provides the user with a series of choices that group services alphabetically. When the user depresses the seven key on the keypad of cellular telephone 100, cellular telephone 100 displays a list of the services that have letters P, R, or S as the first letter in the service name. In this embodiment, screen displays 401 and 402 are a single card, e.g., a single screen. Each of the various services associated with a key has an index and when a particular choice is made by the user, the choice defines an index. The client process then displays all of the services with the index that corresponds to the index defined by the user's choice. In screen display 402, the user is given a series of choices of services that are available to the user under tab seven. Initially, item three in screen display 402 is not highlighted. In this example, the user depresses the three key on the keypad of cellular telephone 100 to select the stock quotes and item three in screen display 402 is highlighted. In response to this selection, cellular telephone 100 transmits a request for a stock quote, i.e., a message including a resource locator, over cellular telephone network 100 and internet 140 to service provider 141. In response to the request, service provider computer 141 executes the application addressed by the resource locator. The application retrieves a card deck that, in turn is transmitted to cellular telephone 100. The card deck includes a display card and an entry card. Upon receiving the card deck, the client process in cellular telephone 100 interprets the display card and generates screen display 403 (Fig. 40). When the user depresses a predetermined key, entry screen display 406 (Fig. 4E) is generated on display screen 105 of cellular telephone 100. Initially, the box with letters SUNW in screen display 406 is empty. The

	letters SUNW are entered in the box by the user to indicate the ticker symbol of the stock for which the user wants information. After the user has entered the stock ticker symbol, the user presses the predetermined key to indicate that the entry is complete. In response to the entry by the user, the client module appends the stock ticker symbol to the resource locator and transmits the resource locator to service provider computer 141 which, in turn, executes an application addressed by the resource locator to retrieve the latest stock market information for the stock ticker symbol. Service provider 141 uses the retrieved information to generate a card deck that contains the information and then transmits the card deck to cellular telephone 100. Rossmann p. 12, lines 25-52 A database is a collection of related objects. Each object has associated attributes, and each attribute assumes one or more values at any given time. Special values are used internally to represent NULL, NIL, EMPTY, UNKNOWN, and similar values. Each object is identified by at least one "key." Some keys are "global" in that they are normally unique within the entire database; other keys are "local" and are unique only within a proper subset of the database. A database is "hierarchical" if the objects are related by their relative position in a hierarchy, such as a file system hierarchy. Hierarchies are often represented by tree structures. The target database includes file descriptor objects, directory descriptor objects, directory services objects, printer job objects, or other objects. The target database is distributed in that entries are kept in the replicas 56 on different computers 40. Each replica 56 in the target database contains at least some of the same variables or records as the other replicas 56. The values stored in different replicas 56 for a given attribute are called "corresponding values." In general, corresponding values will be equal. Falls at Col. 7, lines 24-43 An object is an instance of an object class. The target database contains objects that are defined according to the schema 84 and the particulars of the network 10. Some of these objects may represent resources of the network 10. The target database is a "hierarchical" database because the objects in the database are connected in a hierarchical tree structure. Objects in the tree that can contain other objects are called "container objects" and must be instances of a container object class. Falls at Col. 8, lines 41-49
CLAIM 5	

5. A method for modifying a questionnaire used in data management according to the method of claim 1 including the steps of: (a) making at least one incremental change to a portion of the questionnaire;	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51
(b) tokenizing said at least one incremental change to said questionnaire;	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(c) transmitting at least a portion of said tokens resulting from step (b) to a remote loosely networked computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(d) incorporating said transmitted tokens into said	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on

questionnaire at said loosely networked remote computing device, thereby modifying said questionnaire.	the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
CLAIM 6	
6. A method for managing data according to claim 1, wherein said first wireless modem or wireless LAN network connection and said second wireless modem or wireless LAN network connection are a same wireless modem or wireless LAN network connection.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 7	
7. The method of claim 1 further including performing at least the steps (c)-	Each wireless communication device 100 that includes this invention can communicate over airnet network 150 with any server computer 121, 131, and 141 on airnet network 150 that includes at least one application that communicates and interacts with the processes of this

(k) for at least two different remote computing device types using the same tokens.	invention that are included within device 100. Thus, device 100 can access information on the computer network and provide information to the computer network. Similarly, a two-way pager 101, and a telephone 102 with a modem 103, that each include this invention, can communicate over airnet network 150 with any of server computers 121, 131, and 141 that includes at least one application that communicates and interacts with the processes of this invention that are included within devices 101 and 102. Rossmann p. 6, lines 38-44
CLAIM 8	
8. A method for managing data transfers between computers including the steps of:	As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. Rossmann p. 4, lines 1-9
(a) creating a questionnaire at a first site in a first computer;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18

	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(b) tokenizing said questionnaire, thereby producing a tokenized questionnaire;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card

indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105.

After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F.
Rossmann, p. 10, lines 38-48

In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.**
Rossmann p. 11, lines 15-16

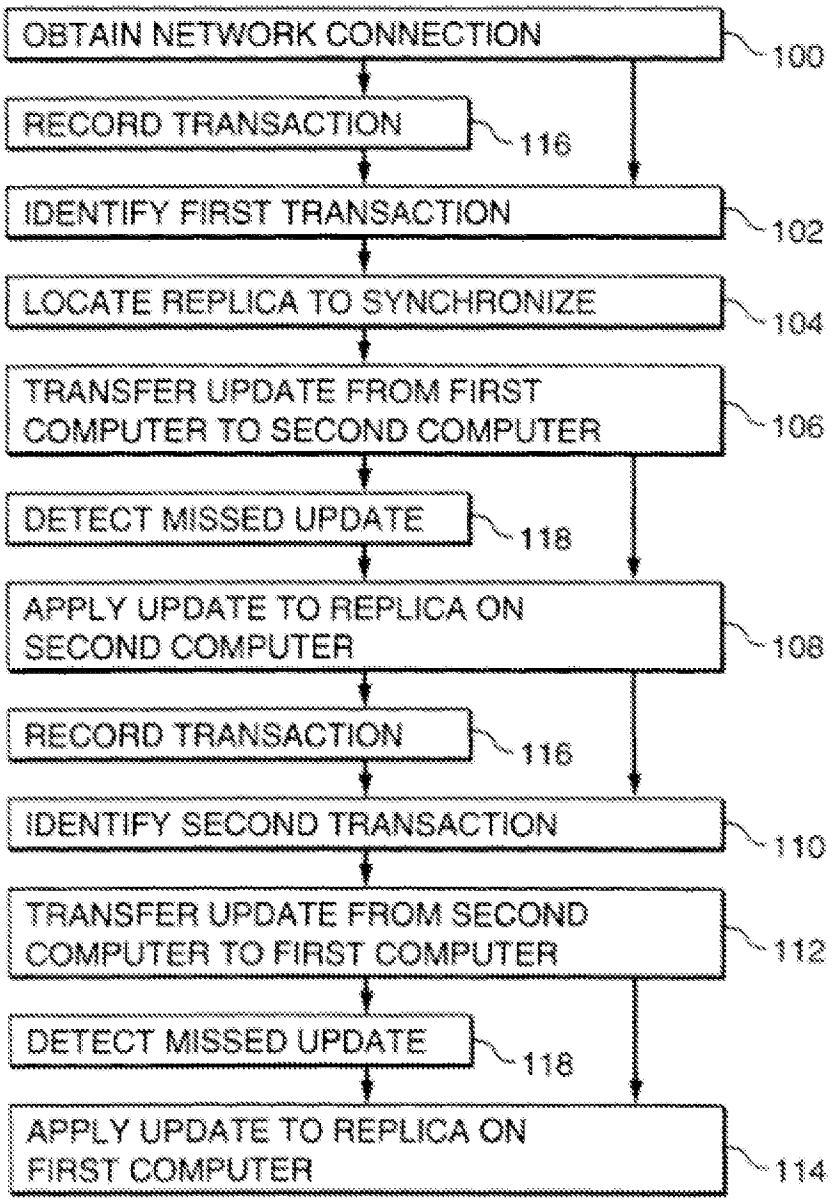
Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression.
Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common
gateway interface application builds a PIDL deck that includes the data

	in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(c) bringing a remote computer into electronic communication with said first computer;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use

	and appearance with the selected portion of the actual network. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29

	 *FIG. 4*
(d) transmitting said tokenized questionnaire to said remote computer;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.
Falls at Abstract

The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does

	not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(e) removing said remote computer from electronic communication with said first computer;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38

	After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

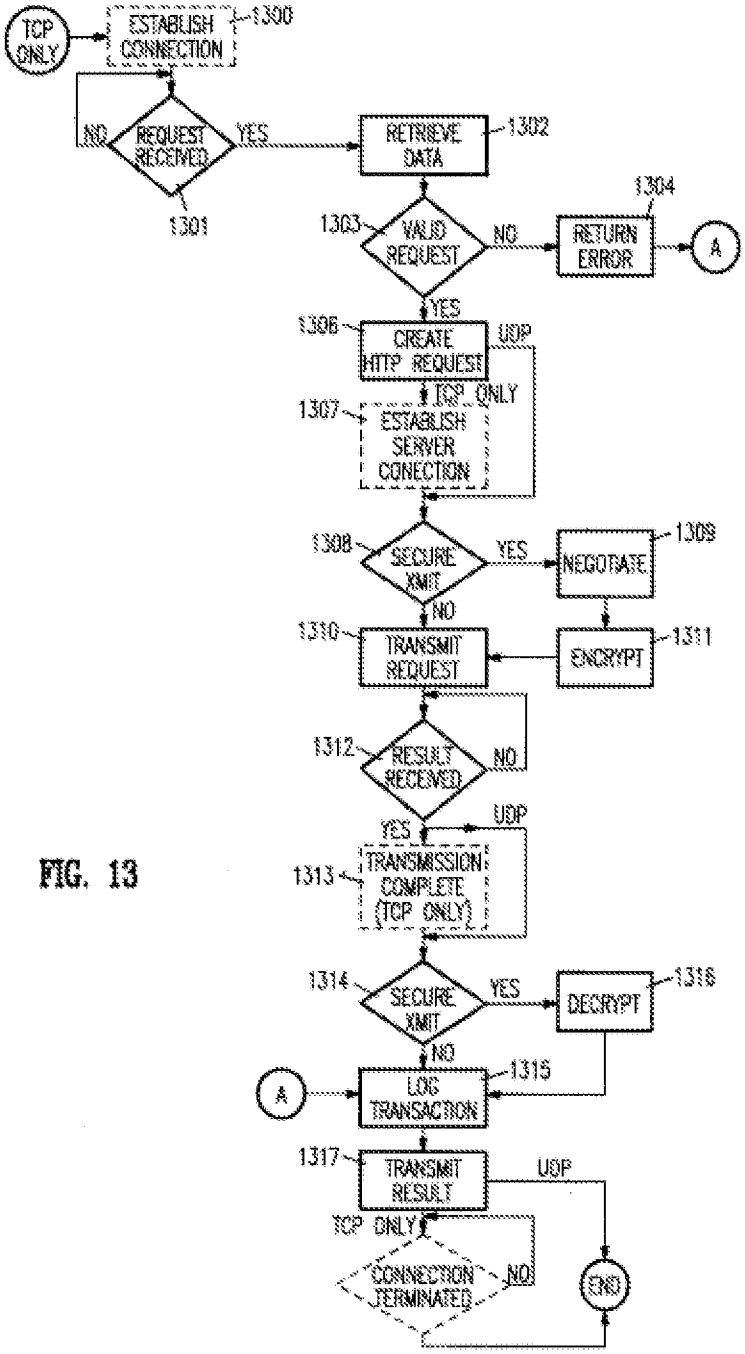


FIG. 13

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to

	the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29 With reference to FIG. 2, at least two of the computers 28 are disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-21
(f) within said remote computer, using said transmitted tokenized questionnaire to obtain at least one user response;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12

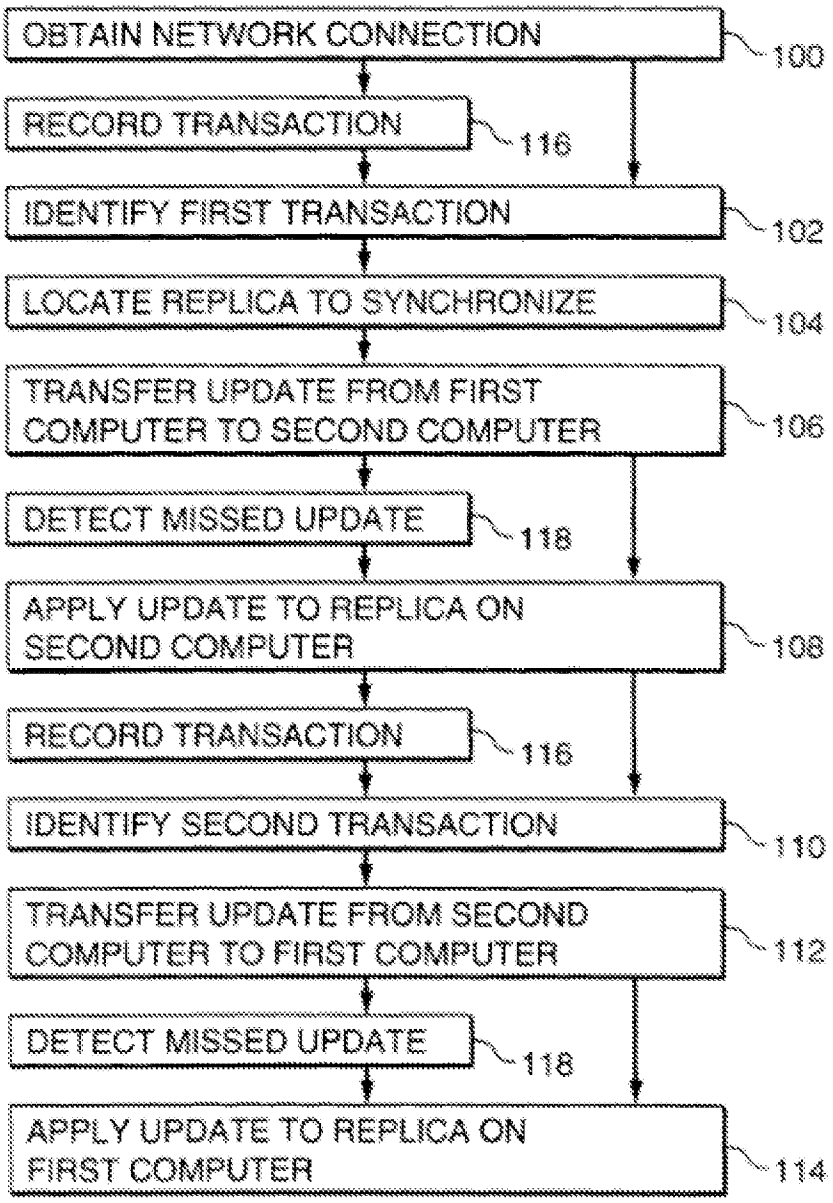
	The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301, the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205. When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and voice messages waiting for the user. Rossmann p. 11, lines 43-52
(g) storing said at least one user response within said remote computer;	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource allocator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer. Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server computer, the client module provides the message to

	the network interface module which in turn transmits the message over the two-way data communication network. Rossmann p. 4, lines 15-21 An important aspect of this invention is that the message includes all information necessary for the client module to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces and possible interactions available to the user are determined only by the applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform. Rossmann at p. 4, lines 29-35 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 1-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18
(h) modifying said questionnaire with incremental changes at a second computer	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data

located at a second site;	communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51
(i) placing said remote computer into electrical communication with said second computer;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

	Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and disconnectability. Falls at 7:53-8:1. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 Merging occurs when two replicas 56 are resynchronized after the

	computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains convergently consistent replicas 56 residing on separate computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention. 35:47-63 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

	 *FIG. 4*
(j) transmitting said incremental changes from said second computer to said remote computer;	This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way

	communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase. Rossmann p. 3, lines 41-49 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(k) modifying said transmitted tokenized questionnaire in said remote computer with said incremental changes, thereby creating a modified tokenized questionnaire;	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and

	any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(l) removing said remote computer from electronic communication with said second computer;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

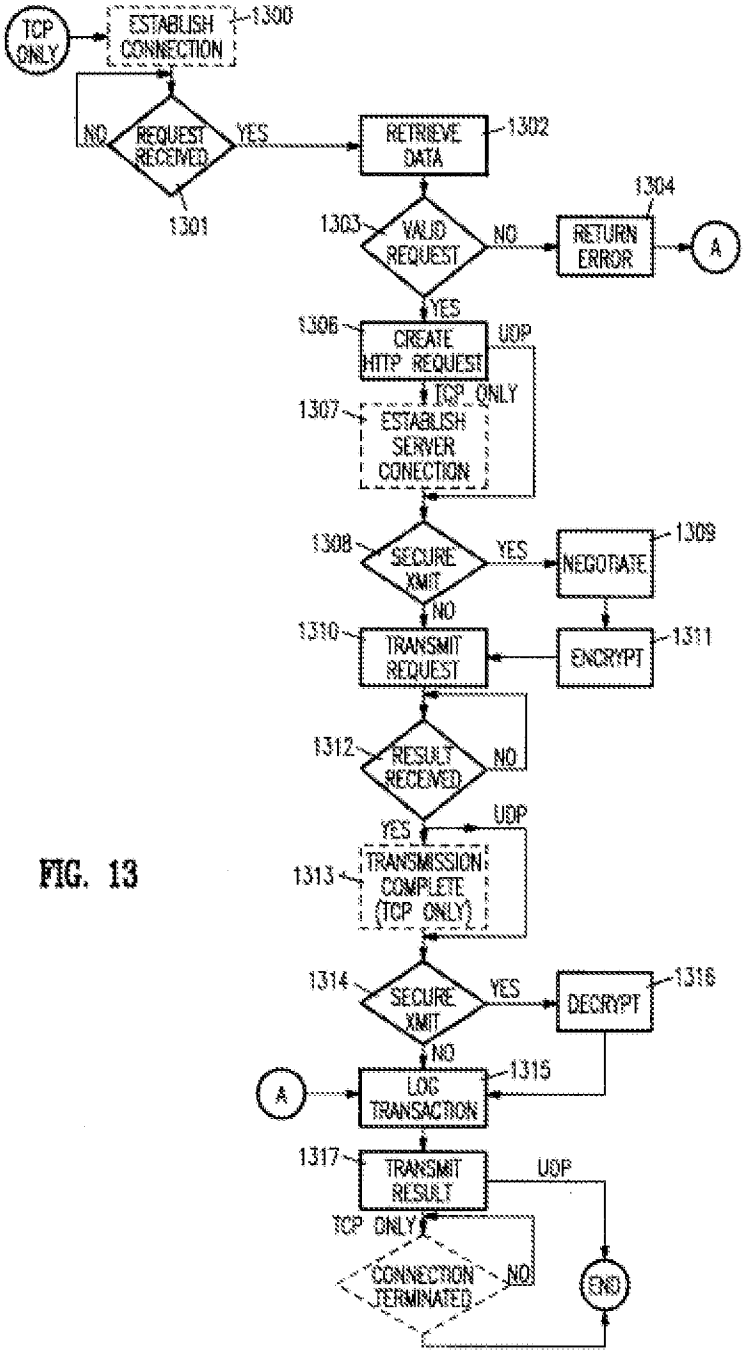


FIG. 13

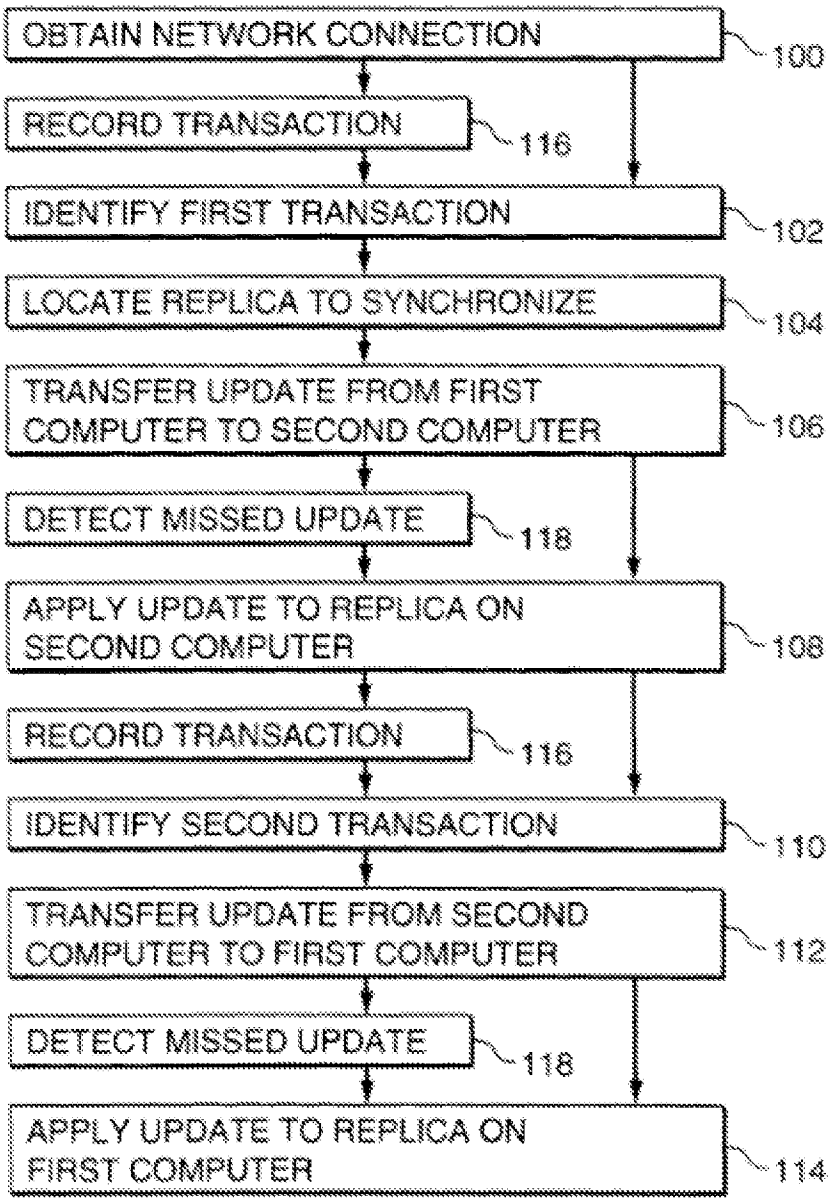
A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to

	the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object

	processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(m) within said remote computer, using said modified tokenized questionnaire to obtain at least one additional user response;	When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource allocator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer. Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server computer, the client module provides the message to the network interface module which in turn transmits the message over the two-way data communication network. Rossmann p. 4, lines 15-21 An important aspect of this invention is that the message includes all information necessary for the client module to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces and possible interactions available to the user are determined only by the applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform. Rossmann at p. 4, lines 29-35 In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen. In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the

	display screen. Rossmann p. 9, lines 1-8
(n) placing said remote computer into electronic communication with a server;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Those of skill in the art will appreciate that other remote procedure call

	mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29

	 *FIG. 4*
(o) transmitting said at least one user response to said server;	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305 is

	on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(p) transmitting said at least one additional user response to said server;	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the

	application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(q) storing said transmitted at least one user response and said at least one additional user response at said server;	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which **stores** the response in a memory. Rossmann p. 4, lines 5-7 When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 47-52 Computer 743 may contain **stored** static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or choices made by, the user of cellular telephone 700. Rossmann p. 15, lines 13-15
(r) preparing a report using any of said at least one user response and said at least one additional user response; and,	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs.

	Rossmann p. 9, lines 15-18 When server computer 121 receives the information, server computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, converts the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(s) displaying at least a portion of said report on a visually perceptible medium;	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs.

	Rossmann p. 9, lines 15-18 When server computer 121 receives the information, server computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, converts the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(t) performing at least steps (d)-(p) using at least two different remote computing device types using the same tokens.	Each wireless communication device 100 that includes this invention can communicate over airnet network 150 with any server computer 121, 131, and 141 on airnet network 150 that includes at least one application that communicates and interacts with the processes of this invention that are included within device 100. Thus, device 100 can access information on the computer network and provide information to

	the computer network. Similarly, a two-way pager 101, and a telephone 102 with a modem 103, that each include this invention, can communicate over airnet network 150 with any of server computers 121, 131, and 141 that includes at least one application that communicates and interacts with the processes of this invention that are included within devices 101 and 102. Rossmann p. 6, lines 38-44
CLAIM 9	
9. The method for managing data transfers between computers according to claim 8 wherein said first computer and said second computer are a same computer.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 10	
10. The method for managing data transfers between computers according to claim 9 wherein said server and said first computer are said same computer.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 11	
11. A method for collecting survey data from a user comprising the steps of:	As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks.

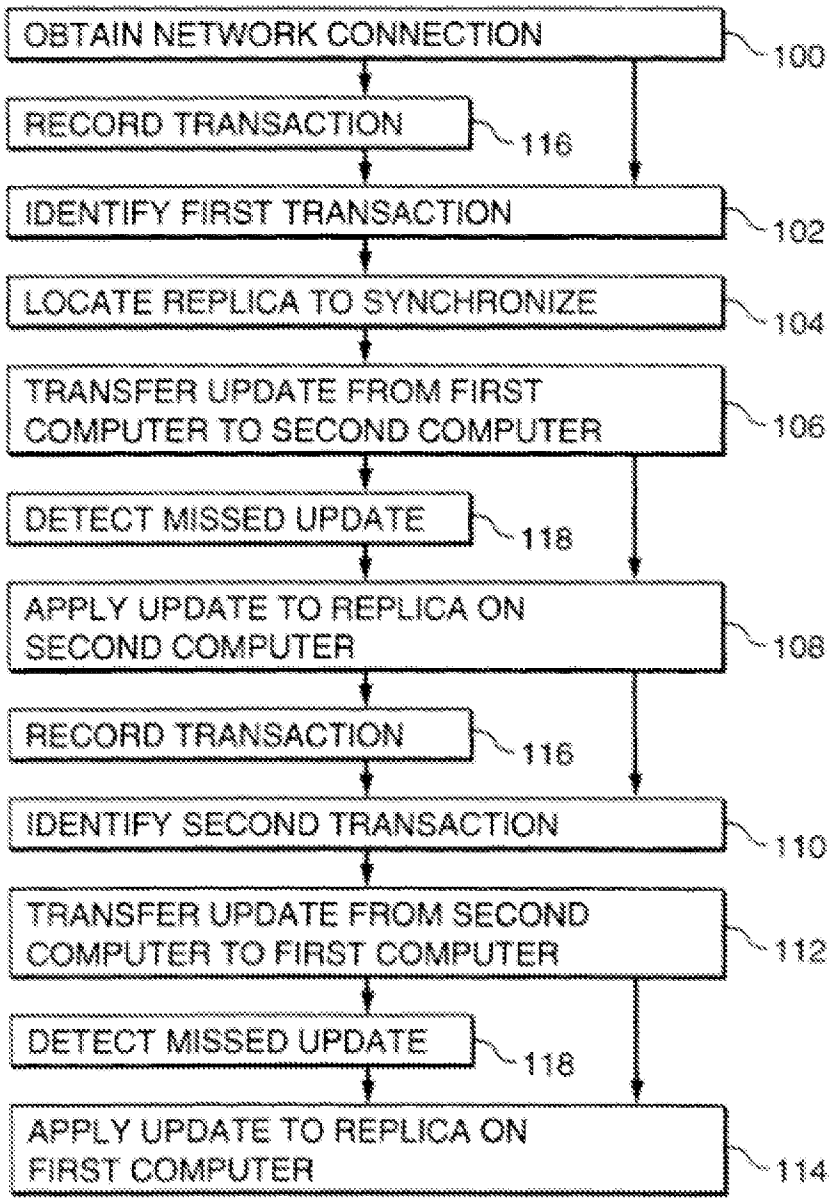
	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. Rossmann p. 4, lines 1-9
(a) creating a questionnaire comprising a series of questions;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8 When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the **appropriate purchase order** and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airnet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key

	sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines, 38-48 For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 38-48 In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.** Rossmann p. 11, lines 15-16 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known

	techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7 For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. **Similarly, for a stock quote**, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query. The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. Rossmann p. 15, lines 56-57
(c) storing said plurality of tokens on a computer readable medium on a first computer;	In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the message, retrieves the appropriate purchase order and **transmits the purchase order as a card deck** to the client process in cellular telephone 100 over airnet network 150. **The client process interprets the card deck** and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209. Notice that screen display 209 includes multi-display screen card

	indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105. After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F. Rossmann p. 10, lines 38-48 In addition, the client process using the information transmitted from server computer 121, **i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H.** Rossmann p. 11, lines 15-16 Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression. Rossmann p. 14, lines 55-58 Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network. Rossmann p. 15, lines 2-7
(d) placing a handheld remote computing device into electronic communication with said first computer;	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37

	For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29

	 *FIG. 4*
(e) transmitting said plurality of tokens to said handheld remote computing device;	In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen. Rossmann p. 9, lines 4-8

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary **tokenization**. Graphics are compressed using run length limited compression and text is compressed using anyone of the well-known techniques for text compression.
Rossmann p. 14, lines 55-58

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into **a deck and a card**. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the 5 number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.
Rossmann p. 15, lines 2-7

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.
Falls at Abstract

The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and

	inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(f) taking said handheld remote computing device out of electronic communication with said first computer;	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38

	After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41

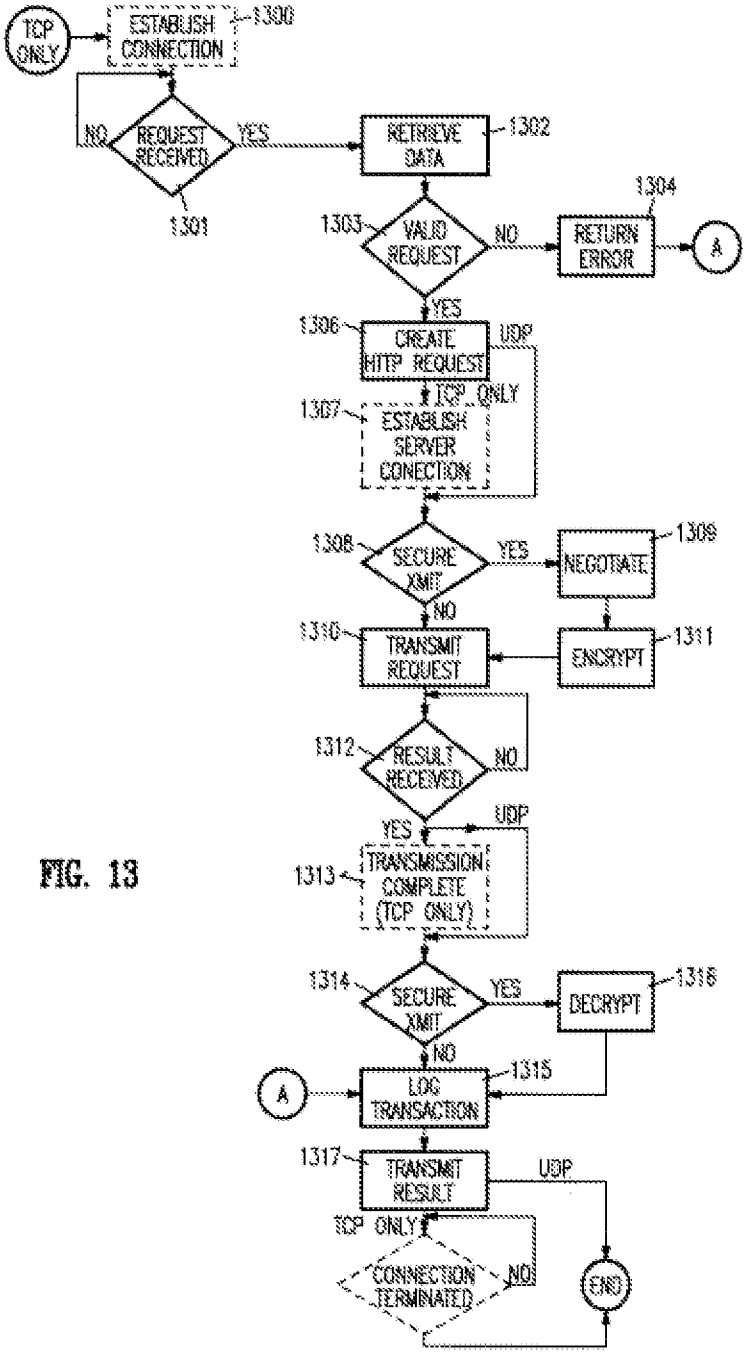


FIG. 13

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to

	the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29 With reference to FIG. 2, at least two of the computers 28 are disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-
(g) after said handheld remote computing device has been taken out of electronic communication with said first computer,	After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated. Rossmann p. 26, lines 5-6. Routine NM_lnit initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine

	NM_ Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402. Rossmann p. 28, lines 39-41 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31

	Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(g1) executing at least a portion of said plurality of tokens representing said questionnaire on said handheld remote computing device to collect a response from a user, and,	For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller. Rossmann p. 15, lines 8-12 The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301 , the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205. When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 43-52 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer

	was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28

	is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(g2) storing within said remote computing device said response from the user;	The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which **stores** the response in a memory. Rossmann p. 4, lines 5-7 When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on *server* computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and *voice* messages waiting for the user. Rossmann p. 11, lines 47-52 Computer 743 may contain **stored** static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or choices made by, the user of cellular telephone 700. Rossmann p. 15, lines 13-15 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select

	data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-
(h) placing said handheld remote	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone,

computing device into electronic communication with a second computer;	any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37 For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability. Rossmann p. 14, lines 35-38 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or

	the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and disconnectability. Falls at 7:53-8:1. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains

	convergently consistent replicas 56 residing on separate computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention. Falls at 35:47-63 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

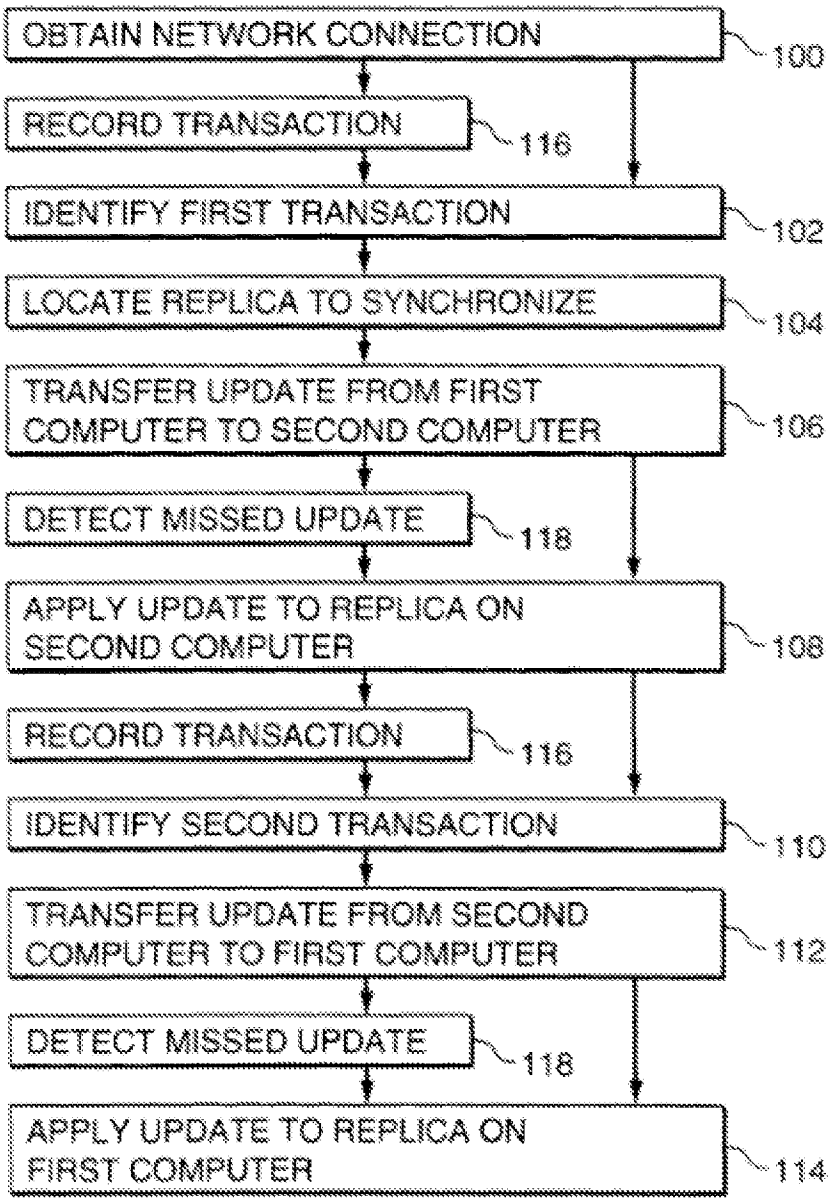


FIG. 4

(i) transmitting at least a portion of said response stored within said handheld remote computing device to said second computer; and,	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 The user scrolls the screen display line by line until screen display 305

	is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
(j) forming a visually perceptible report from any of said at least a portion of said response so transmitted.	When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs. Rossmann p. 9, lines 15-18 When *server* computer 121 receives the information, *server* computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, *converts* the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8 The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not

	highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130. In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day. Rossmann p. 11, line 53 – Rossmann p. 12, line 2 As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example. Rossmann p. 15, lines 23-27
CLAIM 12	
12. A method for collecting survey data from a user according to claim 11, wherein step (j) comprises the step of printing a report from any of said response to transmitted.	When *server* computer 121 receives the information, *server* computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, *converts* the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8
CLAIM 13	
13. A method for collecting survey data from a user according to claim 11, wherein said first computer and said second computer are a same computer.	According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects anyone, any combination, or all of two-way data communication devices 100,101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and

	140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device. Rossmann p. 6, lines 31-37
CLAIM 14	
14. A method for modifying a questionnaire used in data management according to the method of claim 11, further comprising the steps of: (k) making at least one incremental change to a portion of said questionnaire;	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51
(l) tokenizing said at least one incremental change to said questionnaire;	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(m) transmitting at least a portion of said tokens resulting from step (k) to said remote handheld computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and

	any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-44
(n) incorporating said transmitted tokens into said questionnaire at said remote computing device, thereby incrementally changing said questionnaire.	Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only **changes** on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device. Rossmann p. 4, lines 47-51 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401. Rossmann p. 26, lines 37-434

D. CLAIMS 1-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY BENIGNO IN VIEW OF FALLS AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

Please see the below claim chart that applies the teachings of Benigno in view of Falls to claims 1-14 of the '816 patent.

Reasons to Combine:

It would have been obvious to a person of ordinary skill in the art to combine the teachings of Falls with the teachings of Benigno because, Falls provides a method improving synchronization between databases that communicate. It is vitally important to maintain consistency within the medical records of Benigno, which explains the questionnaire and the updates provided by a doctor and the nurse. Benigno at 11:22-26 and FIGs. 1a and 1b. Falls

allows for an improved method of synchronization of the medical questionnaires even "over slow links, such as mobile computing modems." Falls at 37:19-24. Further, Falls details a system that can be "scaled up" to provide medical solutions across multiple fields, nurses, and doctors, to facilitate the wide adoption of standardized care advocated by Benigno. Falls at 37:24-27; *see also* Benigno at 46:16-28 and FIG. 1a. So, a person of ordinary skill in the art looking to improve synchronization between a mobile device and a server, especially in light of the "slow links" associated with mobile communications at the time of the filing of the '816 patent, would be motivated to combine Benigno and Falls to achieve the predictable result of synchronized questionnaires.

Brief Description of Application within Charts Below:

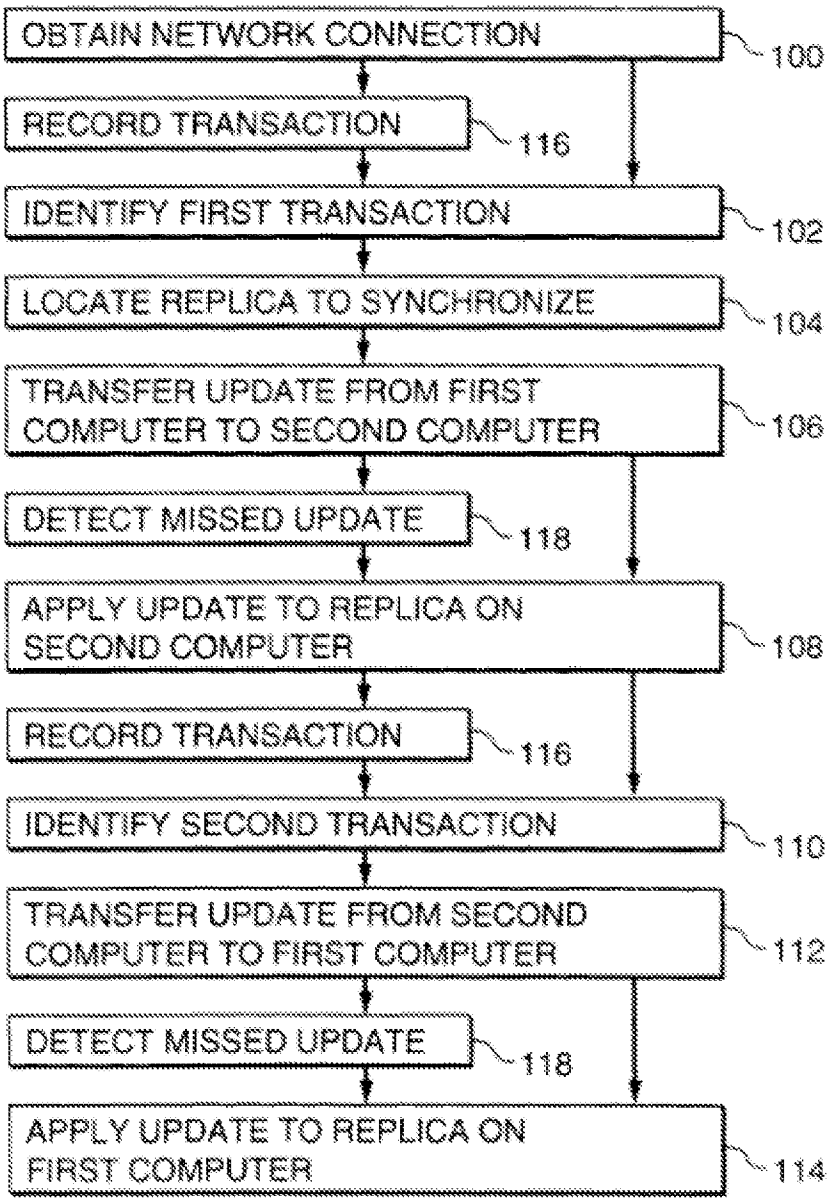
Benigno teaches a questionnaire based on creating a standard of care for treatment of patients that keeps nurses and doctors in constant communication. Benigno at 46:4-9 and 22-24. The nurse is able to answer questions in the questionnaire and based on the responses provided by the patient, the information is updated in the server and subsequent questions are asked. Benigno at 12:17-31. This also allows for individual questions to be used throughout multiple questionnaires, thereby increasing efficiency of the questionnaire database. *Id.* The individual questions are "tokenized representations" that are communicated between the server and the mobile device via wireless network connections. Benigno at 19:10-24, 13:1-10, and 46:4-9. The mobile device can be disconnected from the network communications due to losing the connection as is inevitable in wireless communication or due to the nurse closing the connection. Benigno at 46:4-24 and FIG.1. The nurse can continue to input data into the questionnaire, even though the system is disconnected from the network communications, further, when combined with Falls, the combination further teaches that the questionnaire can continue to be used and a "virtual network" will allow the mobile device to continue normal operations when there is no network connection. Benigno at 46:16-28; Falls at Abstract and 3:16-35. The questionnaire can then be synchronized upon reestablishing the network connection. Falls at Abstract and 3:16-35. The questionnaire is then stored. Benigno at 23:10.

CLAIM 1	Teachings From Benigno in view of Falls
1. A method for managing data including	A self-analyzing system for suggesting deviation from a current clinical pathway and entry into an alternative clinical pathway based

the steps of:	upon historical information about the results of actions. Systems for tracking clinical pathway outcomes based on data collected post-treatment. …. A questionnaire computer language and subsystem are used in various stages of the systems of the invention. Corresponding methods are also disclosed. Benigno at Abstract
(a) creating a questionnaire comprising a series of questions;	Assessment of the patient's condition is performed using a questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. Benigno at 9:31-10:2 Another aspect of the invention involves a new questionnaire format, which may be used as one way of collecting the data to be analyzed according to the present invention. This questionnaire format allows stable acute care caregivers the ability to closely track and instantly inform a patient's physician of that patient's condition. The format, as it applies to a particular patient, also provides the clinical pathway for the patient, as described *infra.* With the present invention, stable acute care providers receive updated orders about the patient on a visit by visit basis and physicians are able to track the progress of their patients instantly. The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:17-31
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24 One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention.

	Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(c) establishing a first wireless modem or wireless LAN network connection with a remote computing device;	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard

	telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29

	 *FIG. 4*
(d) transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again

communicate with server 402, in order to obtain the most current instructions and data.
Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications.
Benigno at 6:26-29

The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting.
Benigno at 9:26-31

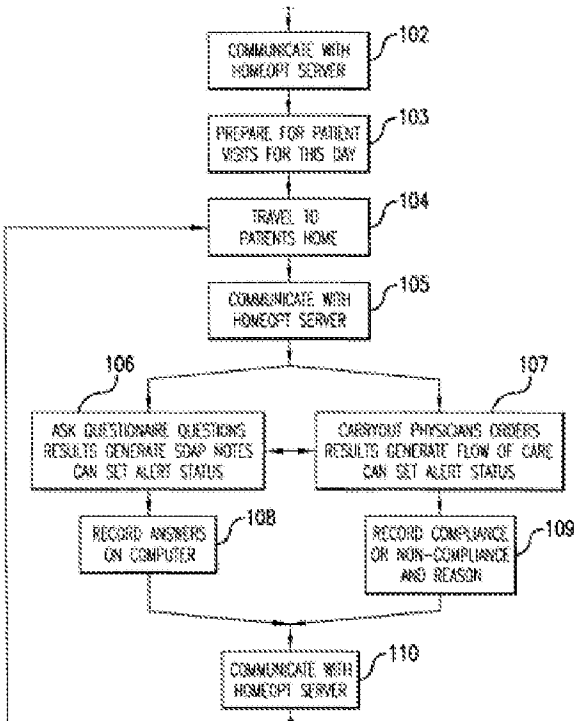
The communications subsystems of the invention are important to its

	capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network,

	the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(e) terminating said first wireless modem or wireless LAN network connection with said remote computing device;	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data.

	Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations

	that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29 With reference to FIG. 2, at least two of the computers 28 are disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-21
(f) after said first wireless modem or	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection

wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user;	mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored, gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28  A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract

The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

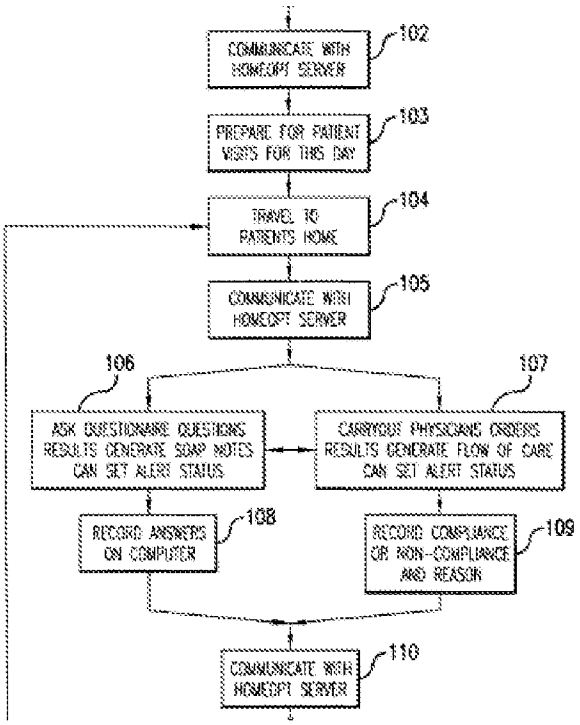
Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer.
Falls at 3:16-35

In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer.
Falls at 5:21-31

Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection.
Falls at 16:35-37

In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash

	handling and retries also make locks optional. Falls at 37:11-18
(g) establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13



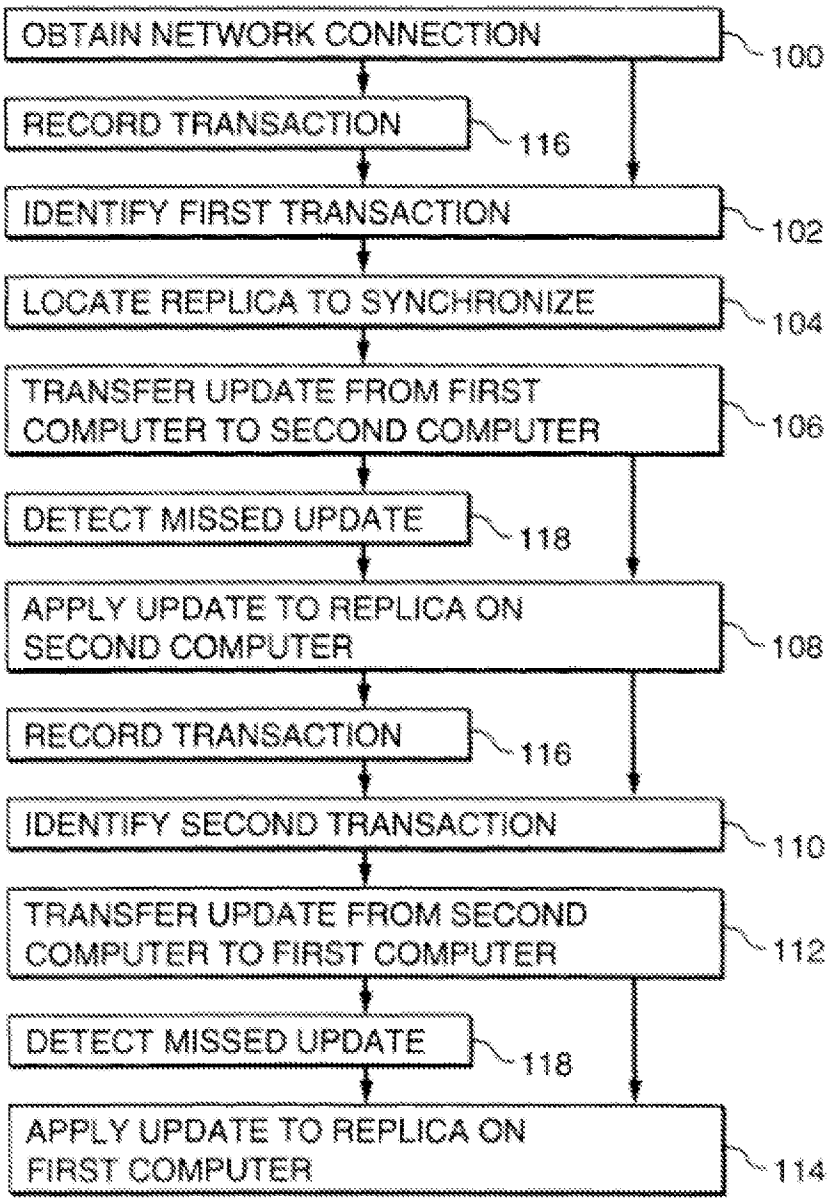
Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.

	Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and

	disconnectability. Falls at 7:53-8:1. Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains convergently consistent replicas 56 residing on separate computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention. 35:47-63 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

	 *FIG. 4*
(h) after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or

or wireless LAN network connection; and	105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored, gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the

	changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(i) storing said transmitted response at said server.	The questionnaire and its answers are all stored. Benigno at 23:10 In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the

	client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored, gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28
CLAIM 2	
2. The method for managing data of claim 1 further comprising the step of: (j) translating said response to a format recognizable by a particular computer program; and	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 A major portion of the communication system of the invention is used to handle connections by physicians and nurses to the system. In one embodiment, data is converted internally to a more efficient format than the external standard HL7 protocol. All communications are coordinated by the server 402 of the system. When a physician or nurse requests information from a source 404 outside of the system, the information may be retrieved from an outside information server 403. Of course, both servers 402, 403 could be implemented on a single machine, if desired. The outside information server 403 contains a translation mechanism for handling translation to and from internal representations based on HL7. By interfacing with HL7, the system of the invention is capable of accessing patient information from existing HL 7 external clients 404, as well as serving such information to HL 7 systems requesting it. Benigno at 30:6-17

(k) accessing the translated response from a computer executing said particular computer program.	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 A major portion of the communication system of the invention is used to handle connections by physicians and nurses to the system. In one embodiment, data is converted internally to a more efficient format than the external standard HL7 protocol. All communications are coordinated by the server 402 of the system. When a physician or nurse requests information from a source 404 outside of the system, the information may be retrieved from an outside information server 403. Of course, both servers 402, 403 could be implemented on a single machine, if desired. The outside information server 403 contains a translation mechanism for handling translation to and from internal representations based on HL7. By interfacing with HL7, the system of the invention is capable of accessing patient information from existing HL 7 external clients 404, as well as serving such information to HL 7 systems requesting it. Benigno at 30:6-17
CLAIM 3	
3. The method for managing data of claim 1 wherein step (a) includes the substeps of: (a)	Assessment of the patient's condition is performed using an questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. In the stable acute care *(e.g.,* "home") setting or facility, the nurse provider can assess the

creating a questionnaire by:	patient and send information regarding the patient by using the questionnaire. The questionnaire itself will create a SOAP (Subjective, Objective, Analysis, Plan) note. The SOAP note is known to those of ordinary skill in the art as the means whereby a physician describes the patient's status and care plan. Benigno at 9:31-10:7
(i) entering a series of questions into a questionnaire design computer program;	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:24-31 As each patient is added to the system, a copy of the base questionnaire for their procedure is produced and offered to the physician or system operator for change. The base questionnaire is simply a set of the clinical pathway node structures as described above. As individual questions are changed, they are versioned, *e.g.,* by incrementing a version number. Versioning of the question can also include further information, such as date and time of the change, identity of the party making the change, original question text, etc., such that the system can provide a suitable audit trail to review all changes in any particular questionnaire. Benigno at 19:28-20:4 As noted above, a predefined preliminary set of these correlation searches may be entered manually and the system is configured to search this problem space automatically. The correlation matrix potentially includes all combinations of all questions in the questionnaire versus all recorded outcomes.

	Benigno at 21:10-13 For use in the system, a questionnaire (again representing the default clinical pathway) is also developed specifically for each procedure. The questionnaire is later processed by the computer software to develop a SOAP note for the patient. When the patient is visited by the nurse, the SOAP note is generated by the computer for that visit and/or procedure. In a similar fashion, events such as IV hydration and IV meds and the use of H2 blockers such as TAGAMET® are also addressed for each procedure. Often, the decision elements or points which yield daily progress notes are similar from one procedure to another. Additionally, an order sheet may be created and may be modified by the physician or the nurse on a daily basis and the orders on the order sheet are determined from the initial order sheet that was created. In this fashion, the initial order sheet is essentially a clinical pathway printout, or at least a decision data element and subsequent data element printout. In essence, the system creates a universal protocol template and, often, only minor changes are needed for each procedure for a specific plan. The data elements tracked in the model include, but are not required to include and are not limited to, appropriate procedures, restrictive criteria for patients, insurance information, pre-operative education, the clinical pathway, daily order sheets for subsequent orders, the questionnaire developed to determine specific notes, and daily progress sheets created to track the fluids, IV's, or medications given. Benigno at 37:5-24
(ii) identifying within said questionnaire design computer program the type of response allowed for each question of said series of questions; and	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the

clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires.
Benigno at 12:24-31

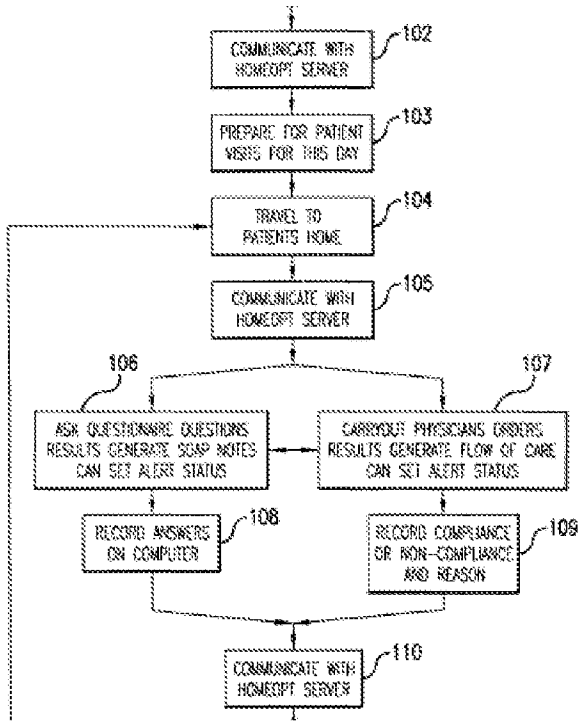
As each patient is added to the system, a copy of the base questionnaire for their procedure is produced and offered to the physician or system operator for change. The base questionnaire is simply a set of the clinical pathway node structures as described above. As individual questions are changed, they are versioned, *e.g.,* by incrementing a version number. Versioning of the question can also include further information, such as date and time of the change, identity of the party making the change, original question text, etc., such that the system can provide a suitable audit trail to review all changes in any particular questionnaire.
Benigno at 19:28-20:4

For use in the system, a questionnaire (again representing the default clinical pathway) is also developed specifically for each procedure. The questionnaire is later processed by the computer software to develop a SOAP note for the patient. When the patient is visited by the nurse, the SOAP note is generated by the computer for that visit and/or procedure. In a similar fashion, events such as IV hydration and IV meds and the use of H2 blockers such as TAGAMET® are also addressed for each procedure. Often, the decision elements or points which yield daily progress notes are similar from one procedure to another. Additionally, an order sheet may be created and may be modified by the physician or the nurse on a daily basis and the orders on the order sheet are determined from the initial order sheet that was created. In this fashion, the initial order sheet is essentially a clinical pathway printout, or at least a decision data element and subsequent data element printout.

In essence, the system creates a universal protocol template and, often, only minor changes are needed for each procedure for a specific plan. The data elements tracked in the model include, but are not required to include and are not limited to, appropriate procedures, restrictive criteria for patients, insurance information, pre-operative education, the clinical pathway, daily order sheets for subsequent orders, the questionnaire developed to determine specific notes, and daily progress sheets created to track the fluids, IV's, or medications given.
Benigno at 37:5-24

(iii) identifying within said questionnaire design computer program a branching path in said questionnaire for each possible response to each question of said series of questions.	This method of representation was chosen to allow for complete flexibility in the representation of the clinical pathway. This structure is what allows the pathway representation to be a dynamic tree as opposed to a simple sequentially-followed set of instructions. In other words, future actions in the clinical pathway can be machine encoded directly into the questionnaire without requiring human intervention to determine the appropriate course of action during the administering of the pathway to a patient. In one embodiment, the invention provides a system for manipulation and analysis of data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway and at least one, preferably a plurality of, subsequent decision data elements, corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the subsequent decision data elements within the clinical pathway database. This will allow the changing of the physical layout of the tree. In other words, it is possible to include totally new decision points, or totally remove decision points from a clinical pathway. This differs from existing systems which simply take a fixed tree and attempt to find individualized parameters within that tree. Benigno at 13:12-14:5 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24 For use in the system, a questionnaire (again representing the default clinical pathway) is also developed specifically for each procedure. The questionnaire is later processed by the computer software to develop a SOAP note for the patient. When the patient is visited by the nurse, the SOAP note is generated by the computer for that visit

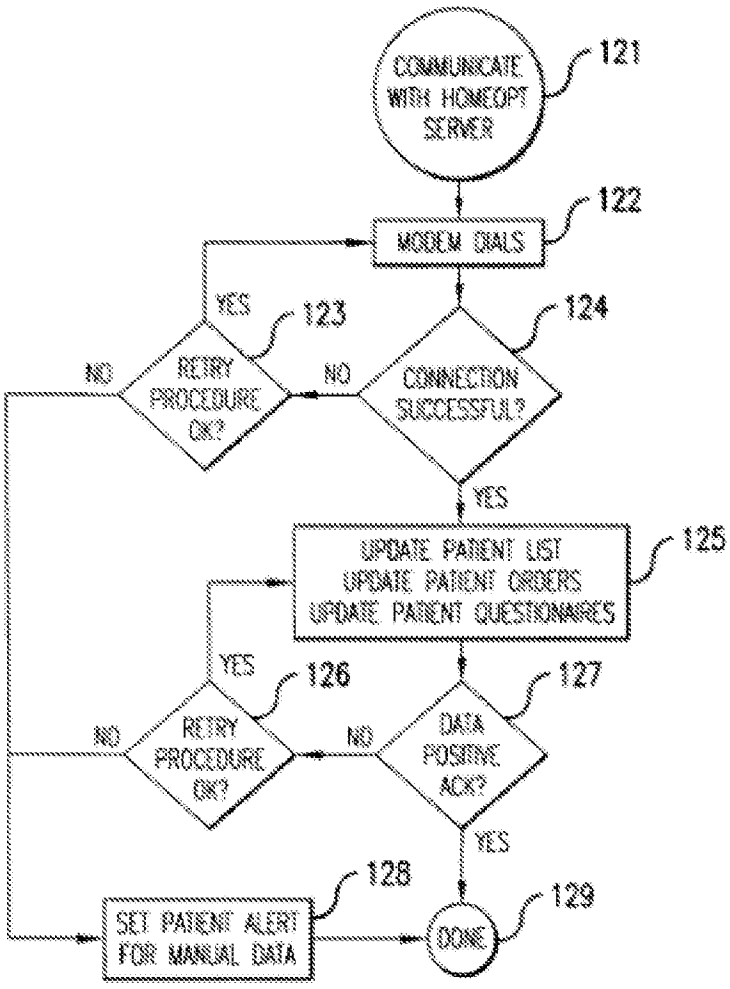
	and/or procedure. In a similar fashion, events such as IV hydration and IV meds and the use of H2 blockers such as TAGAMET® are also addressed for each procedure. Often, the decision elements or points which yield daily progress notes are similar from one procedure to another. Additionally, an order sheet may be created and may be modified by the physician or the nurse on a daily basis and the orders on the order sheet are determined from the initial order sheet that was created. In this fashion, the initial order sheet is essentially a clinical pathway printout, or at least a decision data element and subsequent data element printout. In essence, the system creates a universal protocol template and, often, only minor changes are needed for each procedure for a specific plan. The data elements tracked in the model include, but are not required to include and are not limited to, appropriate procedures, restrictive criteria for patients, insurance information, pre-operative education, the clinical pathway, daily order sheets for subsequent orders, the questionnaire developed to determine specific notes, and daily progress sheets created to track the fluids, IV's, or medications given. Benigno at 37:5-24 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27

	 Benigno at FIG 1A
CLAIM 4	
4. The method for managing data of claim 1 wherein step (b) includes the substeps of: (b) tokenizing said questionnaire thereby producing a plurality of tokens representing said questionnaire by:	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be

	information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(i) assigning at least one token to each question of said series of questions;	Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(ii) assigning at least one token to each response called for in said series of questions to identify the type of response required; and	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the

	language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(iii) assigning at least one token to each branch in said questionnaire to identify the required program control associated with said branch.	This method of representation was chosen to allow for complete flexibility in the representation of the clinical pathway. This structure is what allows the pathway representation to be a dynamic tree as opposed to a simple sequentially-followed set of instructions. In other words, future actions in the clinical pathway can be machine encoded directly into the questionnaire without requiring human intervention to determine the appropriate course of action during the administering of the pathway to a patient. In one embodiment, the invention provides a system for manipulation and analysis of data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway and at least one, preferably a plurality of, subsequent decision data elements, corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the subsequent decision data elements within the clinical pathway database. This will allow the changing of the physical layout of the tree. In other words, it is possible to include totally new decision points, or totally remove decision points from a clinical pathway. This differs from existing systems which simply take a

	fixed tree and attempt to find individualized parameters within that tree. Benigno at 13:12-14:5
CLAIM 5	
5. A method for modifying a questionnaire used in data management according to the method of claim 1 including the steps of: (a) making at least one incremental change to a portion of the questionnaire;	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal,

	selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2  Benigno at FIG. 1B
(b) tokenizing said at	One significant benefit of the invention is that the data gathered about

least one incremental change to said questionnaire;	various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(c) transmitting at least a portion of said tokens resulting from step (b) to a remote loosely networked computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the

physician, while not requiring the supervision to occur in a hospital setting.
Benigno at 9:26-31

The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter.
Benigno at 11:14-19

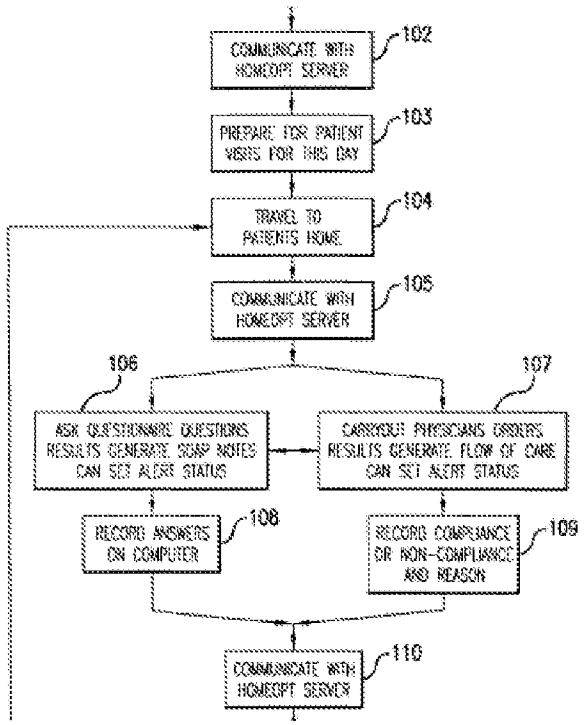
In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link.
Benigno at 46:4-9

In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data.
Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer

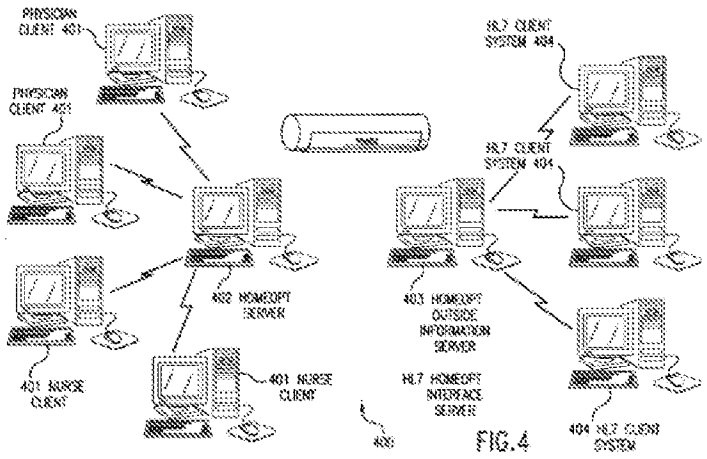
	401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30  Benigno at FIG 1A
(d) incorporating said transmitted tokens into	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous

said questionnaire at said loosely networked remote computing device, thereby modifying said questionnaire.	fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway

	modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 6	
6. A method for managing data according to claim 1, wherein said first wireless modem or wireless LAN network connection and said second wireless modem or wireless LAN network connection are a same wireless modem or wireless LAN network connection.	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place

	via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13
CLAIM 7	
7. The method of claim 1 further including performing at least the steps (c)-(k) for at least two different remote computing device types using the same tokens.	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10

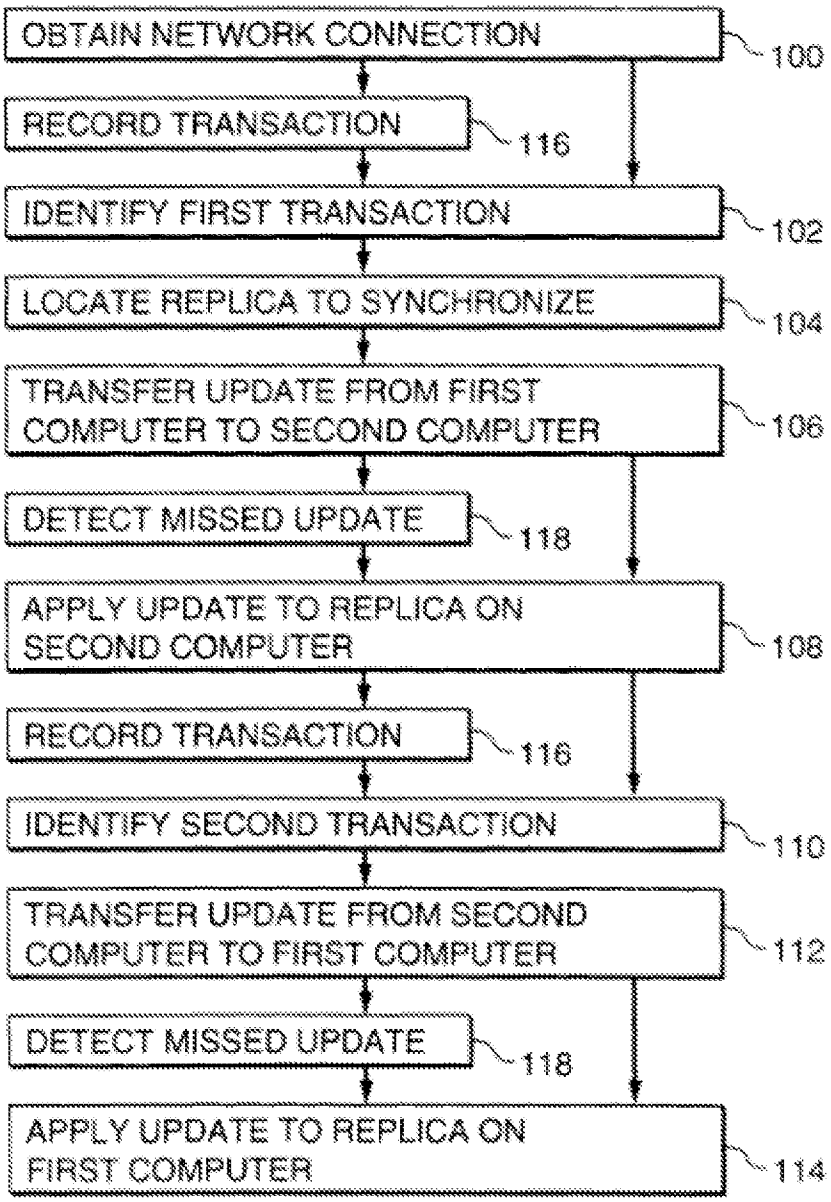
	In a further embodiment, the present invention provides a system for assessing utilization of medical resources based upon manipulation and analysis of statistical data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and, for each of the previously selected subsequent decision data elements, a utilization value corresponding to the decision data element processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, and statistical processing means, in communication with the clinical pathway database and the historical clinical pathway database, for performing the steps of accessing the historical clinical pathway database, computing pathway utilization value based on the accessed utilization values in the database, generating at least one signal corresponding to the pathway utilization value, and outputting the at least one utilization value signal to a signal processing means. Benigno at 15:18-16:7 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24 In step 304, a new patient record is created, using for example the client computer 401 and the server 402. This record may be stored on the server 402, or at any other external location. In step 305, a criteria questionnaire is administered on the client computer 401, in order to determine whether the patient satisfies the criteria to be eligible for, for example, home health care. Examples of such criteria and conditions have been previously described elsewhere. Benigno at 49:10-15

	 Benigno at FIG. 4
CLAIM 8	
8. A method for managing data transfers between computers including the steps of:	A self-analyzing system for suggesting deviation from a current clinical pathway and entry into an alternative clinical pathway based upon historical information about the results of actions. Systems for tracking clinical pathway outcomes based on data collected post-treatment. …. A questionnaire computer language and subsystem are used in various stages of the systems of the invention. Corresponding methods are also disclosed. Benigno at Abstract
(a) creating a questionnaire at a first site in a first computer;	Assessment of the patient's condition is performed using a questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. Benigno at 9:31-10:2 Another aspect of the invention involves a new questionnaire format, which may be used as one way of collecting the data to be analyzed according to the present invention. This questionnaire format allows stable acute care caregivers the ability to closely track and instantly inform a patient's physician of that patient's condition. The format, as it applies to a particular patient, also provides the clinical pathway for the patient, as described *infra*. With the present invention, stable acute care providers receive updated orders about the patient on a visit by visit basis and physicians are able to track the progress of their patients instantly. The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are

	saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:17-31
(b) tokenizing said questionnaire, thereby producing a tokenized questionnaire;	In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*. … Question ID is the identifier of the question itself. Benigno at 19:10-24 One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(c) bringing a remote computer into electronic communication with said	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a

first computer;	suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

	Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods. Falls at 13:60-65 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29

	 *FIG. 4*
(d) transmitting said tokenized questionnaire to said remote computer;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again

communicate with server 402, in order to obtain the most current instructions and data.
Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications.
Benigno at 6:26-29

The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting.
Benigno at 9:26-31

The communications subsystems of the invention are important to its

	capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network,

	the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(e) removing said remote computer from electronic communication with said first computer;	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

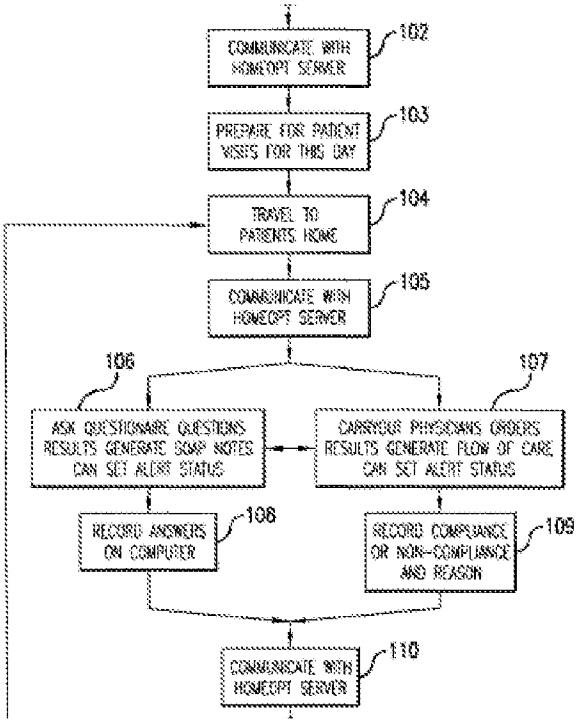
Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

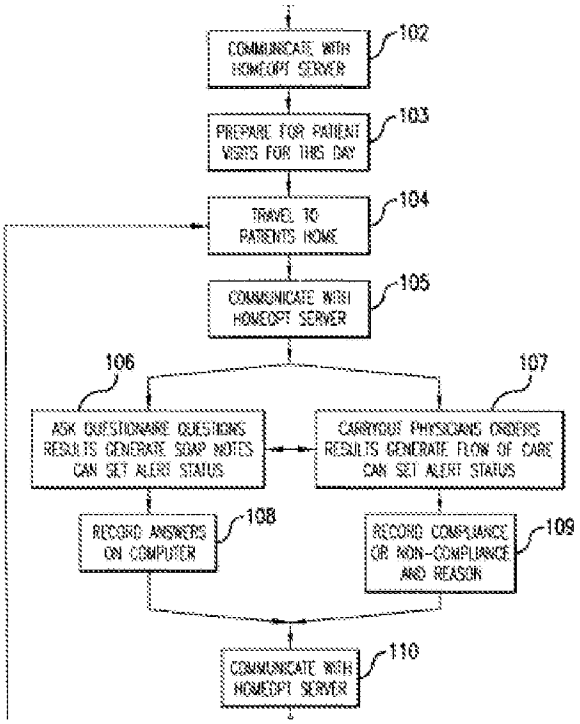
In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that

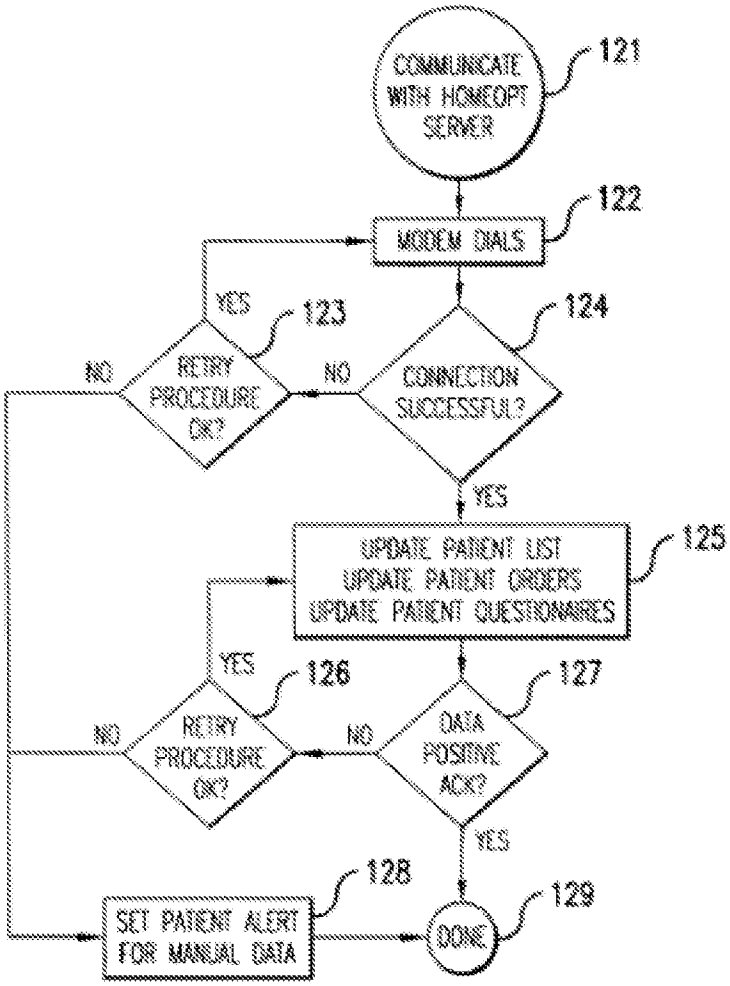
	computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29 With reference to FIG. 2, at least two of the computers 28 are disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-21
(f) within said remote computer, using said transmitted tokenized questionnaire to obtain at	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by

least one user response;	the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28  A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate

	disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

(g) storing said at least one user response within said remote computer;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 
(h) modifying said questionnaire with incremental changes at a second computer located at a second site;	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new

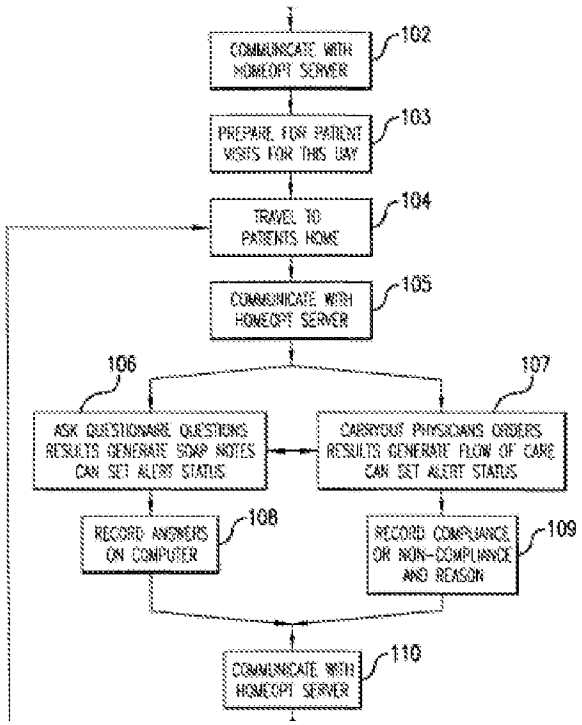
	correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2

	 Benigno at FIG. 1B
(i) placing said remote computer into electrical communication with said second computer;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out

orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13



	Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35

Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established.
Falls at 4:7-14

In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer.
Falls at 5:21-31

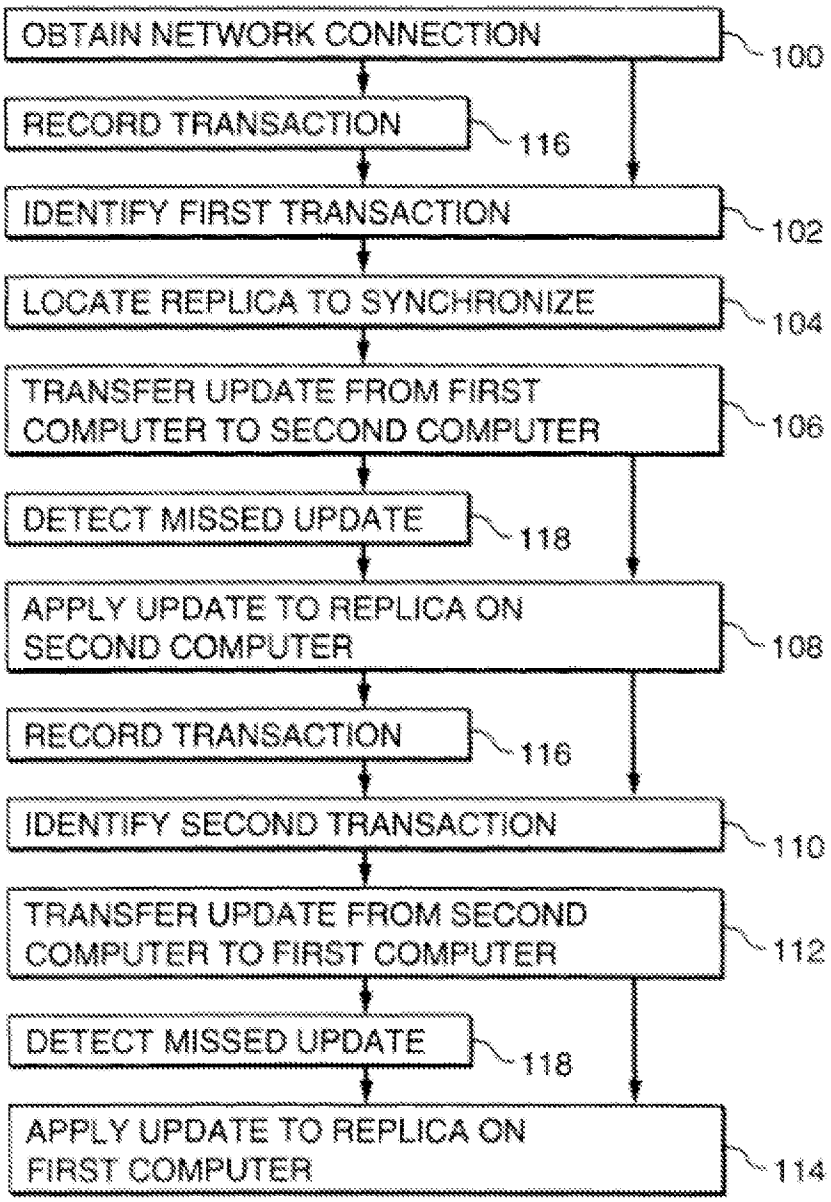
More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and disconnectability.
Falls at 7:53-8:1.

Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods.
Falls at 13:60-65

Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection.
Falls at 16:35-37

With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains convergently consistent replicas 56 residing on separate

	computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention. 35:47-63 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

	 *FIG. 4*
(j) transmitting said incremental changes from said second computer to said remote computer;	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the

clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting.
Benigno at 9:26-31

The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter.
Benigno at 11:14-19

In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link.
Benigno at 46:4-9

In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data.
Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

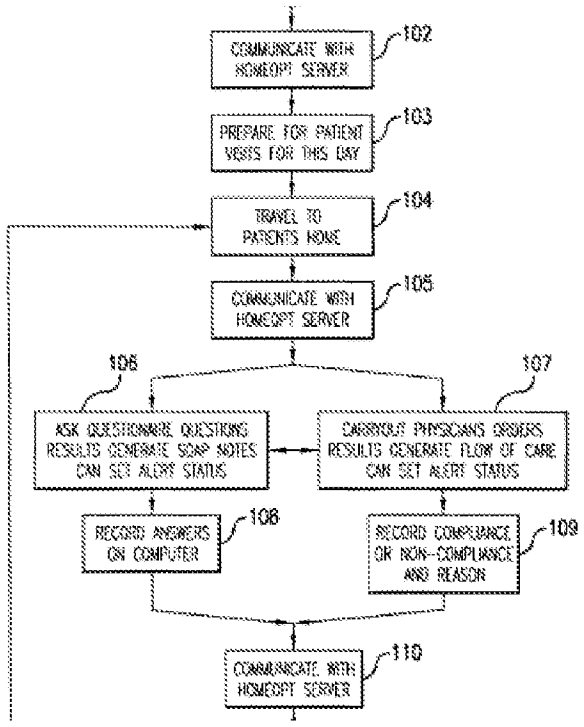
In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the

processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30



Benigno at FIG 1A
A method and apparatus are disclosed for synchronizing transactions

	in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37

	In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(k) modifying said transmitted tokenized questionnaire in said remote computer with said incremental changes, thereby creating a modified tokenized questionnaire;	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements,

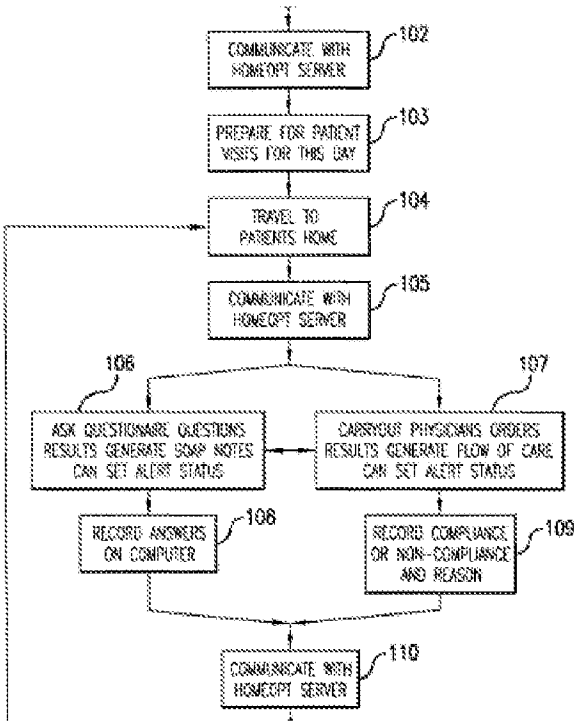
	selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(l) removing said remote	In step 102, the nurse, 5 using the client computer 401 (Figure 4)

computer from electronic communication with said second computer;	communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and

	forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set. Falls at 16:24-29 With reference to FIG. 2, at least two of the computers 28 are

	disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-21
(m) within said remote computer, using said modified tokenized questionnaire to obtain at least one additional user response;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Benigno at 46:16-20
(n) placing said remote computer into electronic communication with a server;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the

processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13



Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

A method and apparatus are disclosed for synchronizing transactions

	in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a

corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer.
Falls at 5:21-31

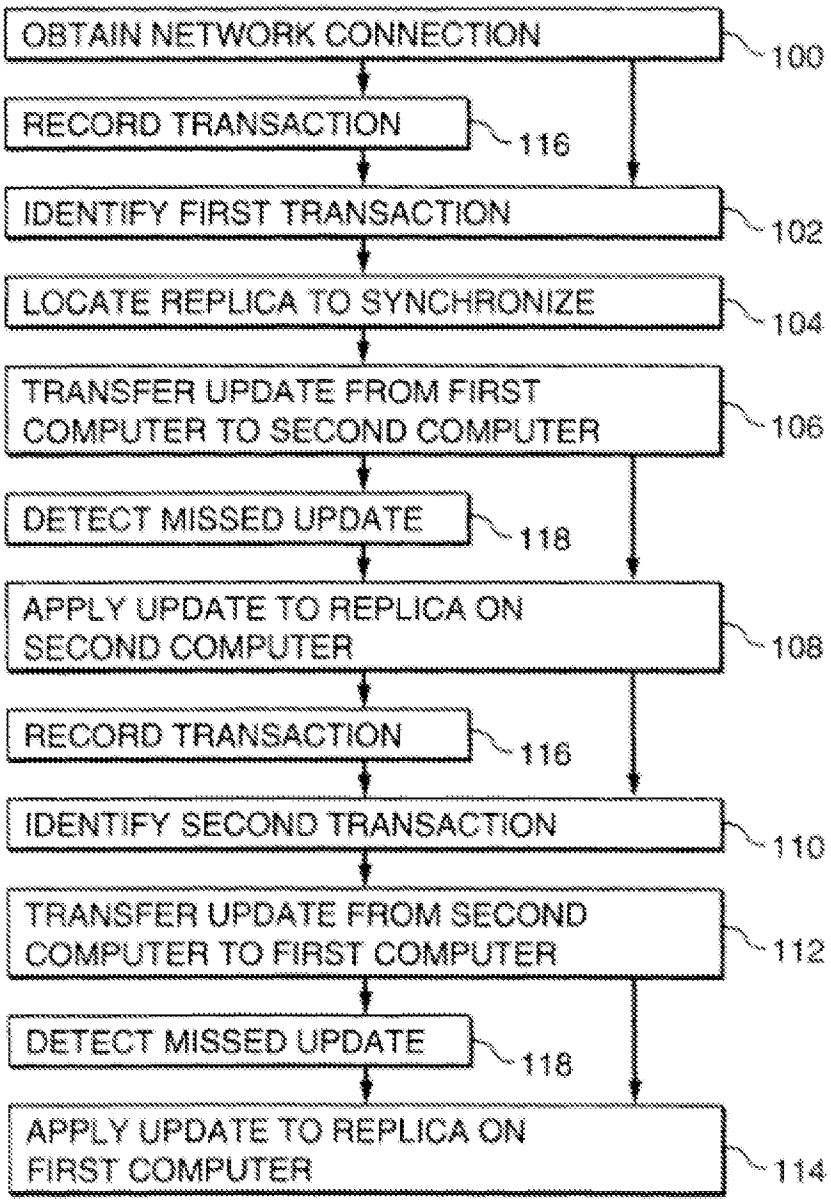
More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and disconnectability.
Falls at 7:53-8:1.

Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods.
Falls at 13:60-65

Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection.
Falls at 16:35-37

With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains convergently consistent replicas 56 residing on separate computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention.
35:47-63

In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means

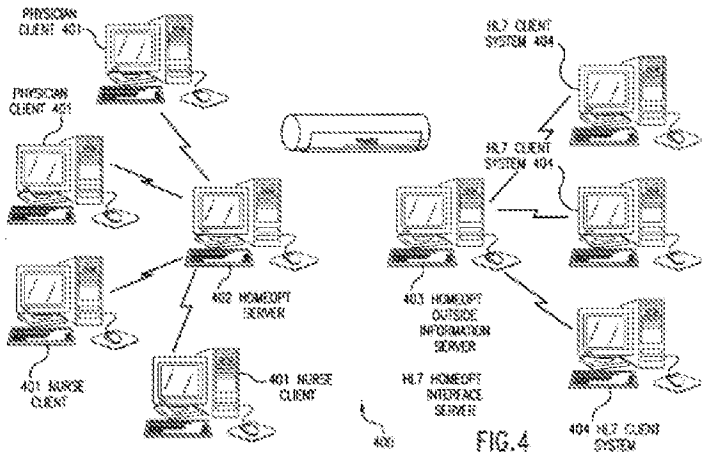
	may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18  *FIG. 4*
(o) transmitting said at least one user response to said server;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can

	be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a

	network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(p) transmitting said at least one additional user response to said server;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Benigno at 46:16-20
(q) storing said transmitted at least one user response and said at least one additional user response at said server;	The questionnaire and its answers are all stored. Benigno at 23:10 In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of

	such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28
(r) preparing a report using any of said at least one user response and said at least one additional user response; and,	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
(s) displaying at least a portion of said report on a visually perceptible medium;	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
(t) performing at least steps (d)-(p) using at least two different remote computing device types using the same tokens.	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10

	In a further embodiment, the present invention provides a system for assessing utilization of medical resources based upon manipulation and analysis of statistical data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and, for each of the previously selected subsequent decision data elements, a utilization value corresponding to the decision data element processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, and statistical processing means, in communication with the clinical pathway database and the historical clinical pathway database, for performing the steps of accessing the historical clinical pathway database, computing pathway utilization value based on the accessed utilization values in the database, generating at least one signal corresponding to the pathway utilization value, and outputting the at least one utilization value signal to a signal processing means. Benigno at 15:18-16:7 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*. … Question ID is the identifier of the question itself. Benigno at 19:10-24 In step 304, a new patient record is created, using for example the client computer 401 and the server 402. This record may be stored on the server 402, or at any other external location. In step 305, a criteria questionnaire is administered on the client computer 401, in order to determine whether the patient satisfies the criteria to be eligible for, for example, home health care. Examples of such criteria and conditions have been previously described elsewhere. Benigno at 49:10-15

	 Benigno at FIG. 4
CLAIM 9	
9. The method for managing data transfers between computers according to claim 8 wherein said first computer and said second computer are a same computer.	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4

	Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 10	
10. The method for managing data transfers between computers according to claim 9 wherein said server and said first computer are said same computer.	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24

	In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 11	
11. A method for collecting survey data from a user comprising the steps of:	A self-analyzing system for suggesting deviation from a current clinical pathway and entry into an alternative clinical pathway based upon historical information about the results of actions. Systems for tracking clinical pathway outcomes based on data collected post-treatment. …. A questionnaire computer language and subsystem are used in various stages of the systems of the invention. Corresponding

	methods are also disclosed. Benigno at Abstract
(a) creating a questionnaire comprising a series of questions;	Assessment of the patient's condition is performed using an questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. Benigno at 9:31-10:2 Another aspect of the invention involves a new questionnaire format, which may be used as one way of collecting the data to be analyzed according to the present invention. This questionnaire format allows stable acute care caregivers the ability to closely track and instantly inform a patient's physician of that patient's condition. The format, as it applies to a particular patient, also provides the clinical pathway for the patient, as described *infra.* With the present invention, stable acute care providers receive updated orders about the patient on a visit by visit basis and physicians are able to track the progress of their patients instantly. The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:17-31
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any

	general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*. … Question ID is the identifier of the question itself. Benigno at 19:10-24
(c) storing said plurality of tokens on a computer readable medium on a first computer;	Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(d) placing a handheld remote computing device into electronic communication with said first computer;	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19

In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link.
Benigno at 46:4-9

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.
Falls at Abstract

The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and

methods.
Falls at 13:60-65

A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set.
Falls at 16:24-29

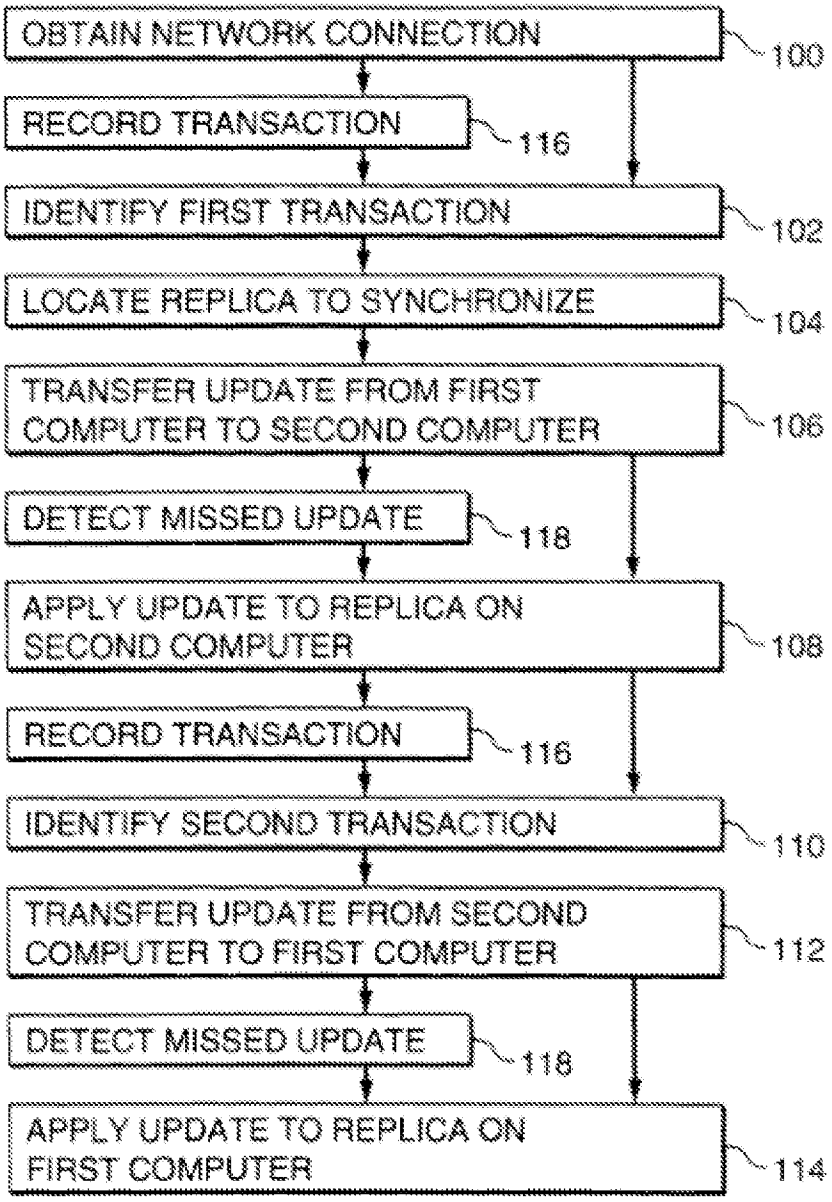


FIG. 4

(e) transmitting said plurality of tokens to said handheld remote computing device;	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on

the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.
Falls at Abstract

The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to

	disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(f) taking said handheld remote computing device out of electronic	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during

communication with said first computer;	visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27

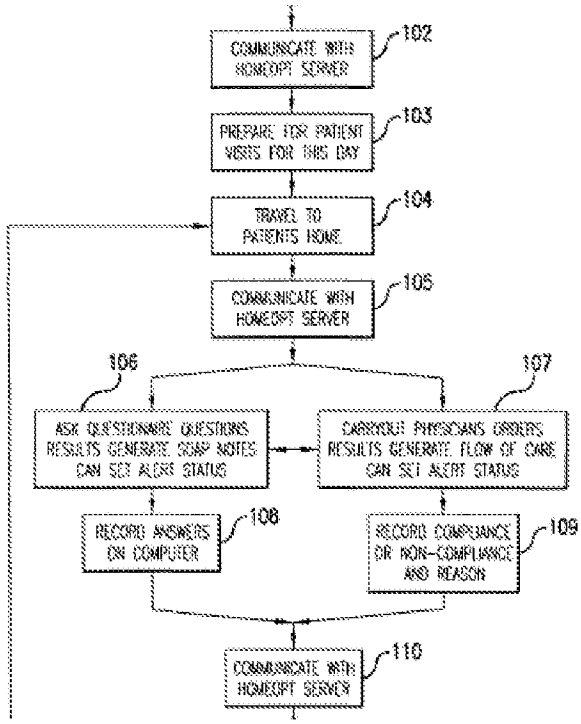
In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.
Falls at Abstract

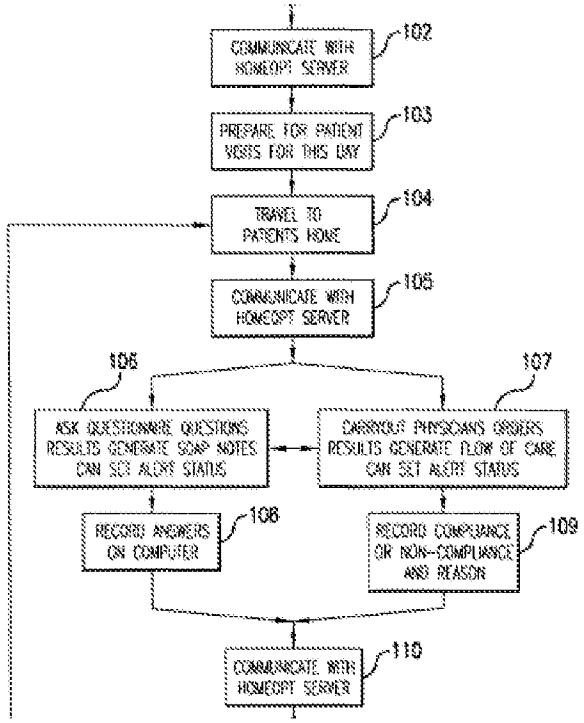
The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network.

Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer.
Falls at 3:16-35
A merge process according to the present invention includes merging location sets when disconnected disconnectable computers are first connected or reconnected. For instance, merging location sets normally occurs when a computer new to the network starts up and merges into an existing location set.
Falls at 16:24-29

With reference to FIG. 2, at least two of the computers 28 are disconnectable computers 40 configured according to the present invention. Each disconnectable computer 40 includes a database

	manager 42 which provides a location independent interface to a distributed hierarchical target database embodied in convergently consistent replicas 56. Falls at 7:16-
(g) after said handheld remote computing device has been taken out of electronic communication with said first computer,	In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14  Benigno at FIG 1A A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the

	invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(g1) executing at least a portion of said plurality of tokens representing	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source

said questionnaire on said handheld remote computing device to collect a response from a user, and,	corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28  Benigno at FIG 1A A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate

	disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18

(g2) storing within said remote computing device said response from the user;	In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:25-28 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a

	corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37 In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(h) placing said handheld remote computing device into electronic communication with a second computer;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all

patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

	A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 Each computer's replica manager communicates with the device controller of that computer and with the network link. Each replica manager also communicates with a database manager on its computer. The database manager can send database transactions to the device controller only through the replica manager, allowing the replica managers to log transactions and to synchronize the transactions after the network connection is re-established. Falls at 4:7-14 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that

targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer.
Falls at 5:21-31

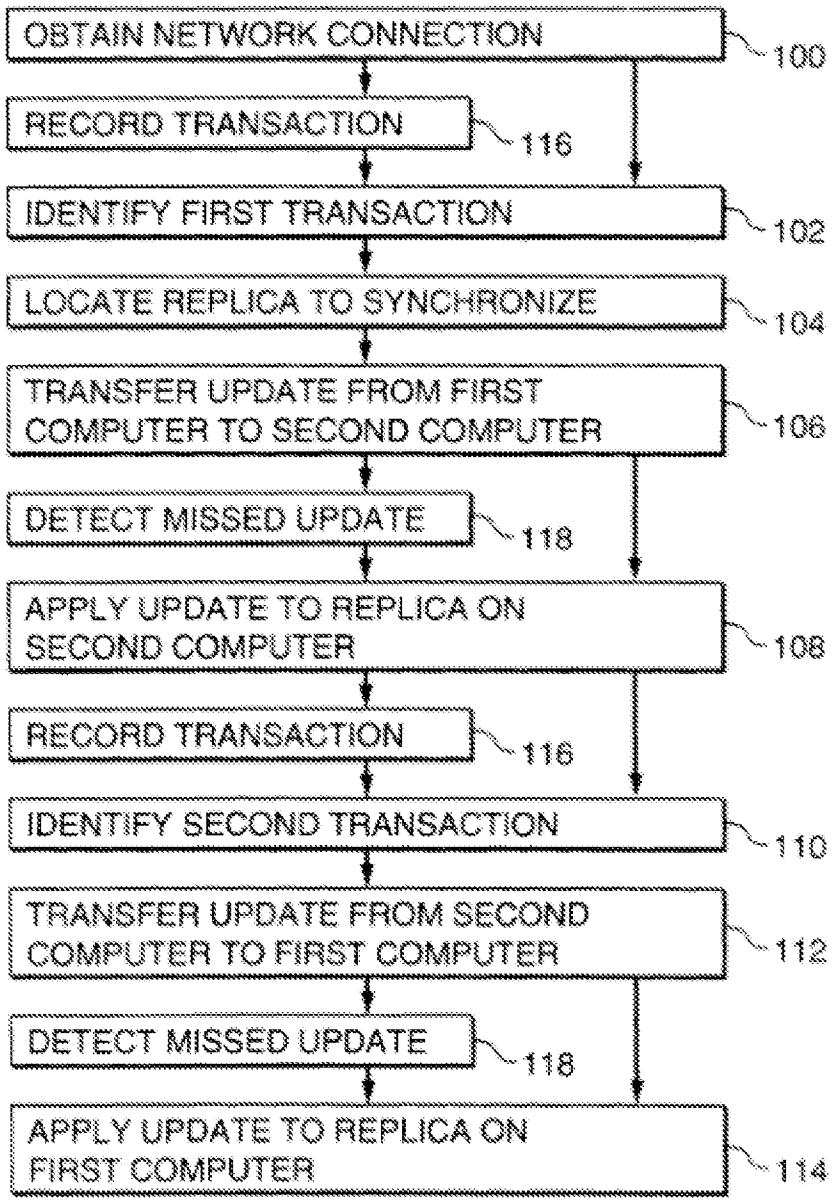
More generally, the present invention provides a basis for a family of distributed software applications utilizing the target database by providing capabilities which support replication, distribution, and disconnectability.
Falls at 7:53-8:1.

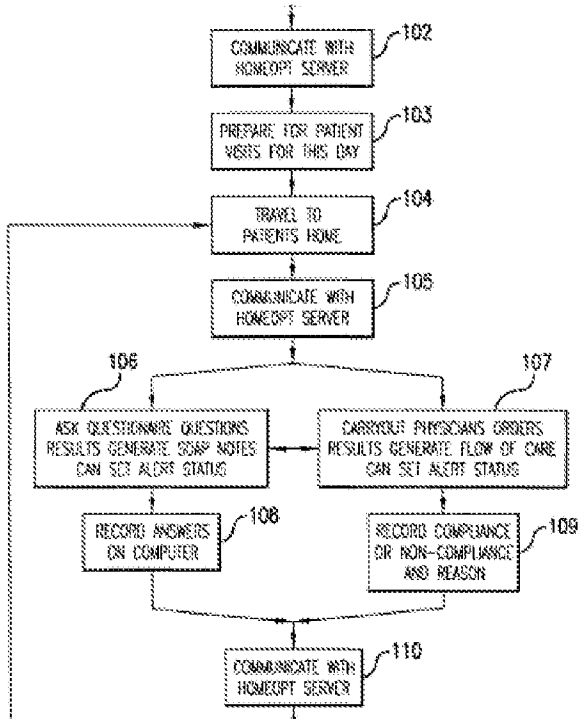
Those of skill in the art will appreciate that other remote procedure call mechanisms may also be employed according to the present invention. Suitable network connections 52 may be established using packet-based, serial, internet compatible, local area, metropolitan area, wide area, and wireless network transmission systems and methods.
Falls at 13:60-65

Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection.
Falls at 16:35-37

With reference to FIGS. 1 through 4 and particular focus on FIG. 4, a method of the present invention for synchronizing transactions in the network 10 of connectable computers 28 is illustrated. The transactions target entries in a distributed hierarchical database that contains convergently consistent replicas 56 residing on separate computers 28 in the network 10. The method comprises the following computer-implemented steps. A connecting step 100 uses the replica manager 46 and network link manager 50 to establish a network connection between a first computer 36 and a second computer 38. For purposes of illustrating the method, the first computer 36 shown in FIG. 1 is a client computer 20 and the second computer 38 is a server computer 16. However, a server and a client, or two servers, or two clients, may also be synchronized and otherwise managed according to the present invention.
35:47-63

In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor

	82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18  *FIG. 4*
(i) transmitting at least a portion of said response stored within said handheld remote	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by

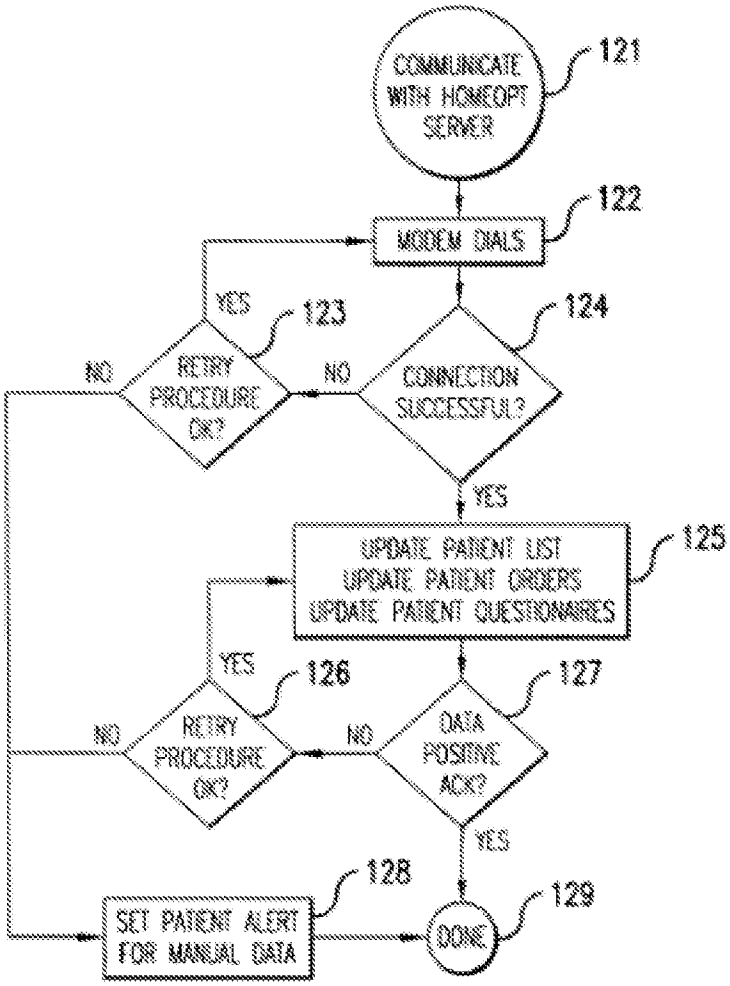
computing device to said second computer; and,	the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28  Benigno at FIG 1A In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations

	that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention. Falls at Abstract The present invention provides a system and method which facilitate disconnected mobile computing in several ways. Prior to disconnection, the invention allows network administrators or users to readily select data that should be copied from a network to a mobile computer by simply identifying one or more target database subtrees. During disconnected operation of the mobile computer, the invention presents the user with a "virtual network" environment that is consistent in use and appearance with the selected portion of the actual network. Finally, upon reconnection of the mobile computer to the network, the invention synchronizes operations performed on the mobile computer during the disconnected interval with operations performed on the network during that interval. Synchronization is both substantially automatic and transactional, so minimal user intervention is needed and inconsistent internal states are avoided. Moreover, synchronization does not routinely discard any of the changes made on either the network or the mobile computer. Falls at 3:16-35 In operation, the replica managers synchronize transactions upon reconnection in the following manner. Using the network link, a network connection is created between the mobile computer and a network computer. The network computer need not be the network computer from which the mobile computer was disconnected. The replica manager on the mobile computer identifies a transaction that targets an object in a replica on the mobile computer, and locates a corresponding replica that resides on the network computer. The mobile computer then transfers an update based on the transaction over the network connection to the network computer. Falls at 5:21-31 Merging occurs when two replicas 56 are resynchronized after the computers 28 on which the replicas 56 reside are reconnected following a period of disconnection. Falls at 16:35-37

	In summary the present invention provides a system and method for properly synchronizing transactions when a disconnectable computer 28 is reconnected to the network 10. The invention is not limited to file system operations but can instead be extended to support a variety of database objects by using the schema 84, object distributor 82, object processor 86, and other modules. Clash handling means may be used to identify potentially conflicting database changes and allow their resolution by either automatic or manual means. Clash handling and retries also make locks optional. Falls at 37:11-18
(j) forming a visually perceptible report from any of said at least a portion of said response so transmitted.	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
CLAIM 12	
12. A method for collecting survey data from a user according to claim 11, wherein step (j) comprises the step of printing a report from any of said response to transmitted.	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
CLAIM 13	
13. A method for collecting survey data from a user according to claim 11, wherein said first computer and said second computer are a same computer.	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24

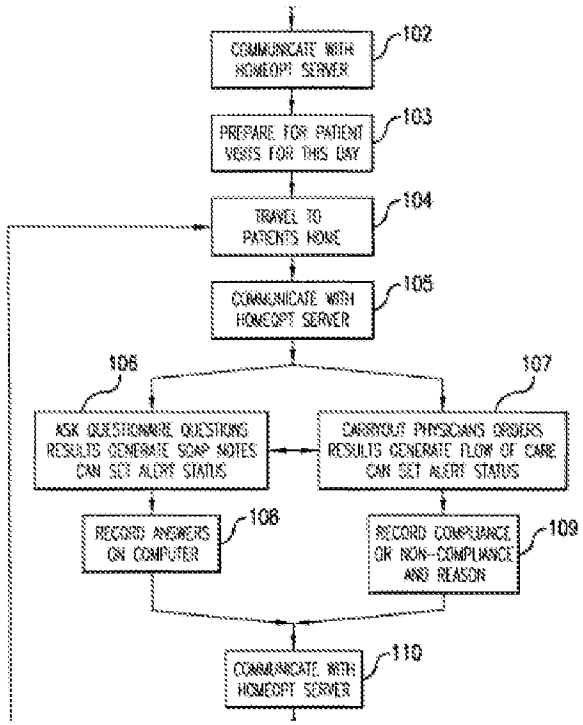
	In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 14	
14. A method for modifying a questionnaire used in data management according to the method of claim 11, further	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26

comprising the steps of: (k) making at least one incremental change to a portion of said questionnaire;	The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2

	 Benigno at FIG. 1B
(l) tokenizing said at least one incremental change to said questionnaire;	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31

	Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(m) transmitting at least a portion of said tokens resulting from step (k) to said remote handheld computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19

	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of

	care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30  Benigno at FIG 1A
(n) incorporating said transmitted tokens into said questionnaire at said remote computing device, thereby incrementally changing said questionnaire.	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29

	In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13

	Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30

E. CLAIMS 1-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY BENIGNO IN VIEW OF RAPPAPORT AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

Please see the below claim chart that applies the teachings of Benigno in view of Rappaport to claims 1-14 of the '816 patent.

Reasons to Combine:

A person of ordinary skill in the art would recognize that Benigno teaches that a mobile device that connects to a server and transmits information between the two devices. *See* Benigno at 11:14-19, 46:4-9, and 47:6-13. It would have been obvious to combine Benigno with Rappaport so that when a connection fails, as will predictably happen, the device can reconnect and send the information upon reconnection. This would motivate a person of skill in the art to make the combination since disconnections are a common occurrence and Rappaport teaches a method of reconnection. *See* Rappaport at Abstract.

Brief Description of Application within Charts Below:

Benigno teaches a questionnaire based on creating a standard of care for treatment of patients that keeps nurses and doctors in constant communication. Benigno at 46:4-9 and 22-24. The nurse is able to answer questions in the questionnaire and based on the responses provided by the patient, the information is updated in the server and subsequent questions are asked. Benigno at 12:17-31. This also allows for individual questions to be used throughout multiple questionnaires, thereby increasing efficiency of the questionnaire database. *Id.* The individual

questions are "tokenized representations" that are communicated between the server and the mobile device via wireless network connections. Benigno at 19:10-24, 13:1-10, and 46:4-9. The mobile device can be disconnected from the network communications due to losing the connection as is inevitable in wireless communication or due to the nurse closing the connection. Benigno at 46:4-24 and FIG.1. The nurse can continue to input data into the questionnaire, even though the system is disconnected from the network communications, further, when combined with Rappaport, the combination further teaches that the questionnaire can continue to be used while real-time data communications are prioritized over data communications, allowing the mobile device to continue normal operations when there is no network connection. Benigno at 46:16-28; Rappaport at 7:44-63 and 2:44-58. The questionnaire is then stored. Benigno at 23:10.

CLAIM 1	**Teachings From Benigno in view of Rappaport**
1. A method for managing data including the steps of:	A self-analyzing system for suggesting deviation from a current clinical pathway and entry into an alternative clinical pathway based upon historical information about the results of actions. Systems for tracking clinical pathway outcomes based on data collected post-treatment. …. A questionnaire computer language and subsystem are used in various stages of the systems of the invention. Corresponding methods are also disclosed. Benigno at Abstract
(a) creating a questionnaire comprising a series of questions;	Assessment of the patient's condition is performed using a questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. Benigno at 9:31-10:2 Another aspect of the invention involves a new questionnaire format, which may be used as one way of collecting the data to be analyzed according to the present invention. This questionnaire format allows stable acute care caregivers the ability to closely track and instantly inform a patient's physician of that patient's condition. The format, as it applies to a particular patient, also provides the clinical pathway for the patient, as described *infra.* With the present invention, stable acute care providers receive updated orders about the patient on a visit by visit basis and physicians are able to track the progress of their patients instantly. The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file.

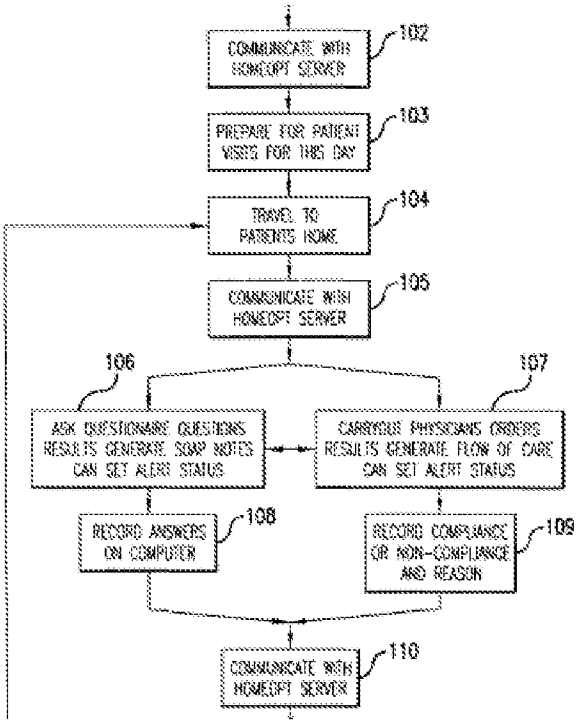
	Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:17-31
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*. … Question ID is the identifier of the question itself. Benigno at 19:10-24 One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(c) establishing a first wireless modem or wireless LAN network connection with a remote	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the

computing device;	invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13
(d) transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on

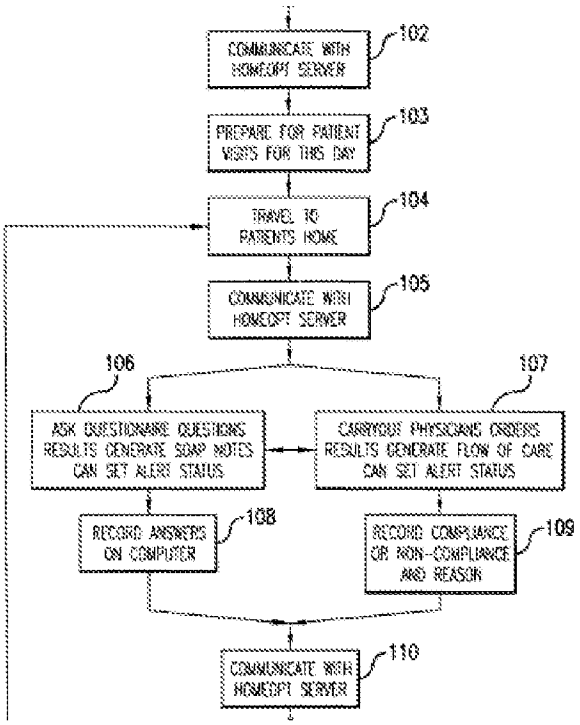
	the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401

	by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(e) terminating said first wireless modem or wireless LAN network connection with said remote computing device;	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may

	be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30 Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive

	data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(f) after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored, gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 
(g) establishing a second	In step 102, the nurse, using the client computer 401 (Figure 4)

wireless modem or wireless LAN network connection between said remote computing device and a server;	communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13

	 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(h) after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of

connection; and	such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4
(i) storing said transmitted response at said server.	The questionnaire and its answers are all stored. Benigno at 23:10 In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28
CLAIM 2	
2. The method for managing data of claim 1 further comprising the step of: (j) translating said response to a format recognizable by a particular computer	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for

program; and	appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 A major portion of the communication system of the invention is used to handle connections by physicians and nurses to the system. In one embodiment, data is converted internally to a more efficient format than the external standard HL7 protocol. All communications are coordinated by the server 402 of the system. When a physician or nurse requests information from a source 404 outside of the system, the information may be retrieved from an outside information server 403. Of course, both servers 402, 403 could be implemented on a single machine, if desired. The outside information server 403 contains a translation mechanism for handling translation to and from internal representations based on HL7. By interfacing with HL7, the system of the invention is capable of accessing patient information from existing HL 7 external clients 404, as well as serving such information to HL 7 systems requesting it. Benigno at 30:6-17
(k) accessing the translated response from a computer executing said particular computer program.	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing

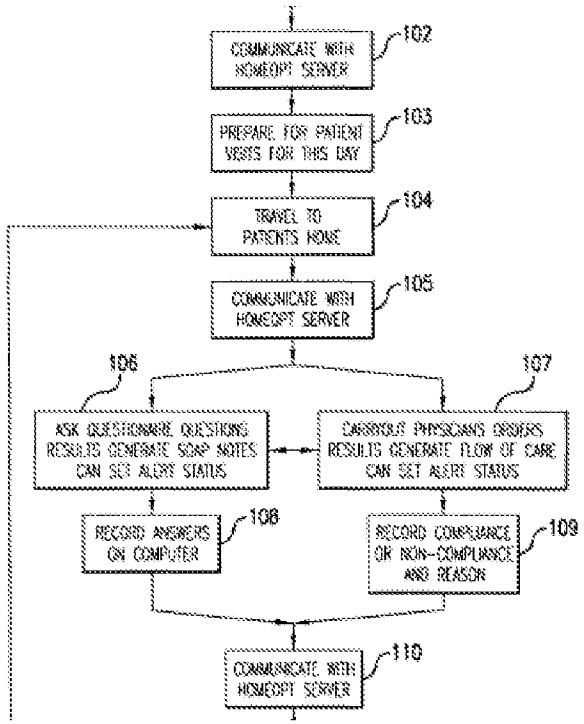
	complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 A major portion of the communication system of the invention is used to handle connections by physicians and nurses to the system. In one embodiment, data is converted internally to a more efficient format than the external standard HL7 protocol. All communications are coordinated by the server 402 of the system. When a physician or nurse requests information from a source 404 outside of the system, the information may be retrieved from an outside information server 403. Of course, both servers 402, 403 could be implemented on a single machine, if desired. The outside information server 403 contains a translation mechanism for handling translation to and from internal representations based on HL7. By interfacing with HL7, the system of the invention is capable of accessing patient information from existing HL 7 external clients 404, as well as serving such information to HL 7 systems requesting it. Benigno at 30:6-17
CLAIM 3	
3. The method for managing data of claim 1 wherein step (a) includes the substeps of: (a) creating a questionnaire by:	Assessment of the patient's condition is performed using an questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. In the stable acute care *(e.g.,* "home") setting or facility, the nurse provider can assess the patient and send information regarding the patient by using the questionnaire. The questionnaire itself will create a SOAP (Subjective, Objective, Analysis, Plan) note. The SOAP note is known to those of ordinary skill in the art as the means whereby a physician describes the patient's status and care plan. Benigno at 9:31-10:7
(i) entering a series of questions into a questionnaire design computer program;	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for

	appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:24-31 As each patient is added to the system, a copy of the base questionnaire for their procedure is produced and offered to the physician or system operator for change. The base questionnaire is simply a set of the clinical pathway node structures as described above. As individual questions are changed, they are versioned, *e.g.,* by incrementing a version number. Versioning of the question can also include further information, such as date and time of the change, identity of the party making the change, original question text, etc., such that the system can provide a suitable audit trail to review all changes in any particular questionnaire. Benigno at 19:28-20:4 As noted above, a predefined preliminary set of these correlation searches may be entered manually and the system is configured to search this problem space automatically. The correlation matrix potentially includes all combinations of all questions in the questionnaire versus all recorded outcomes. Benigno at 21:10-13 For use in the system, a questionnaire (again representing the default clinical pathway) is also developed specifically for each procedure. The questionnaire is later processed by the computer software to develop a SOAP note for the patient. When the patient is visited by the nurse, the SOAP note is generated by the computer for that visit and/or procedure. In a similar fashion, events such as IV hydration and IV meds and the use of H2 blockers such as TAGAMET® are also addressed for each procedure. Often, the decision elements or points which yield daily progress notes are similar from one procedure to another. Additionally, an order sheet may be created and may be modified by the physician or the nurse on a daily basis and the orders on the order sheet are determined from the initial order

	sheet that was created. In this fashion, the initial order sheet is essentially a clinical pathway printout, or at least a decision data element and subsequent data element printout. In essence, the system creates a universal protocol template and, often, only minor changes are needed for each procedure for a specific plan. The data elements tracked in the model include, but are not required to include and are not limited to, appropriate procedures, restrictive criteria for patients, insurance information, pre-operative education, the clinical pathway, daily order sheets for subsequent orders, the questionnaire developed to determine specific notes, and daily progress sheets created to track the fluids, IV's, or medications given. Benigno at 37:5-24
(ii) identifying within said questionnaire design computer program the type of response allowed for each question of said series of questions; and	The important features of the system of the invention include the use of a computerized or electronic interface between the skilled nurse/caregiver, the patient, and the physician. In addition, the invention relies upon specialized software subsystems that allow the use of the interface, allow immediate translation from questionnaire into on-screen formats which can be read by a physician or staff, and allow prequalifying of patients during the pre-operative period for appropriate *(i.e.,* earlier or later than the average) release and stable acute care. Benigno at 10:20-26 The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:24-31 As each patient is added to the system, a copy of the base questionnaire for their procedure is produced and offered to the physician or system operator for change. The base questionnaire is simply a set of the clinical pathway node structures as described above. As individual questions are changed, they are versioned, *e.g.,* by incrementing a version number. Versioning of the question can also include further information, such as date and time of the change, identity of the party making the change, original question text, etc.,

	such that the system can provide a suitable audit trail to review all changes in any particular questionnaire. Benigno at 19:28-20:4 For use in the system, a questionnaire (again representing the default clinical pathway) is also developed specifically for each procedure. The questionnaire is later processed by the computer software to develop a SOAP note for the patient. When the patient is visited by the nurse, the SOAP note is generated by the computer for that visit and/or procedure. In a similar fashion, events such as IV hydration and IV meds and the use of H2 blockers such as TAGAMET® are also addressed for each procedure. Often, the decision elements or points which yield daily progress notes are similar from one procedure to another. Additionally, an order sheet may be created and may be modified by the physician or the nurse on a daily basis and the orders on the order sheet are determined from the initial order sheet that was created. In this fashion, the initial order sheet is essentially a clinical pathway printout, or at least a decision data element and subsequent data element printout. In essence, the system creates a universal protocol template and, often, only minor changes are needed for each procedure for a specific plan. The data elements tracked in the model include, but are not required to include and are not limited to, appropriate procedures, restrictive criteria for patients, insurance information, pre-operative education, the clinical pathway, daily order sheets for subsequent orders, the questionnaire developed to determine specific notes, and daily progress sheets created to track the fluids, IV's, or medications given. Benigno at 37:5-24
(iii) identifying within said questionnaire design computer program a branching path in said questionnaire for each possible response to each question of said series of questions.	This method of representation was chosen to allow for complete flexibility in the representation of the clinical pathway. This structure is what allows the pathway representation to be a dynamic tree as opposed to a simple sequentially-followed set of instructions. In other words, future actions in the clinical pathway can be machine encoded directly into the questionnaire without requiring human intervention to determine the appropriate course of action during the administering of the pathway to a patient. In one embodiment, the invention provides a system for manipulation and analysis of data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway and at least one, preferably a plurality of, subsequent

	decision data elements, corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the subsequent decision data elements within the clinical pathway database. This will allow the changing of the physical layout of the tree. In other words, it is possible to include totally new decision points, or totally remove decision points from a clinical pathway. This differs from existing systems which simply take a fixed tree and attempt to find individualized parameters within that tree. Benigno at 13:12-14:5 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24 For use in the system, a questionnaire (again representing the default clinical pathway) is also developed specifically for each procedure. The questionnaire is later processed by the computer software to develop a SOAP note for the patient. When the patient is visited by the nurse, the SOAP note is generated by the computer for that visit and/or procedure. In a similar fashion, events such as IV hydration and IV meds and the use of H2 blockers such as TAGAMET® are also addressed for each procedure. Often, the decision elements or points which yield daily progress notes are similar from one procedure to another. Additionally, an order sheet may be created and may be modified by the physician or the nurse on a daily basis and the orders on the order sheet are determined from the initial order sheet that was created. In this fashion, the initial order sheet is essentially a clinical pathway printout, or at least a decision data element and subsequent data element printout. In essence, the system creates a universal protocol template and, often, only minor changes are needed for each procedure for a specific plan. The data elements tracked in the model include, but are

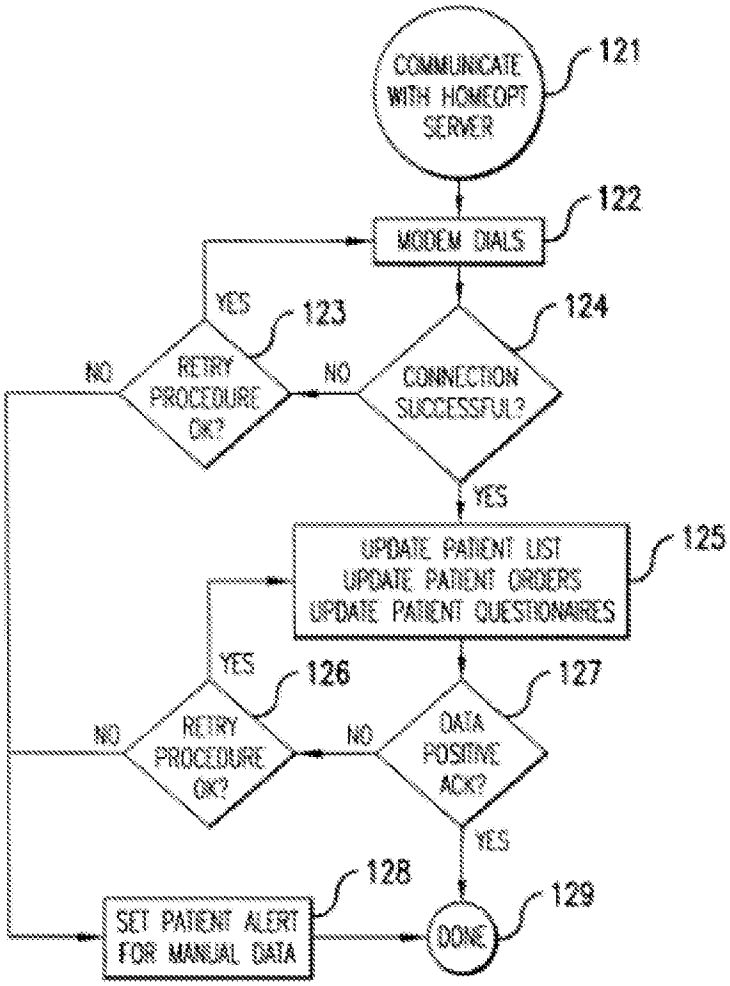
	not required to include and are not limited to, appropriate procedures, restrictive criteria for patients, insurance information, pre-operative education, the clinical pathway, daily order sheets for subsequent orders, the questionnaire developed to determine specific notes, and daily progress sheets created to track the fluids, IV's, or medications given. Benigno at 37:5-24 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27  Benigno at FIG 1A
CLAIM 4	
4. The method for managing data of claim 1 wherein step (b) includes the substeps of: (b)	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of

tokenizing said questionnaire thereby producing a plurality of tokens representing said questionnaire by:	this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(i) assigning at least one token to each question of said series of questions;	Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10

(ii) assigning at least one token to each response called for in said series of questions to identify the type of response required; and	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(iii) assigning at least one token to each branch in said questionnaire to identify the required program control associated with said branch.	This method of representation was chosen to allow for complete flexibility in the representation of the clinical pathway. This structure is what allows the pathway representation to be a dynamic tree as opposed to a simple sequentially-followed set of instructions. In other words, future actions in the clinical pathway can be machine encoded directly into the questionnaire without requiring human intervention to determine the appropriate course of action during the administering of the pathway to a patient. In one embodiment, the invention provides a system for manipulation

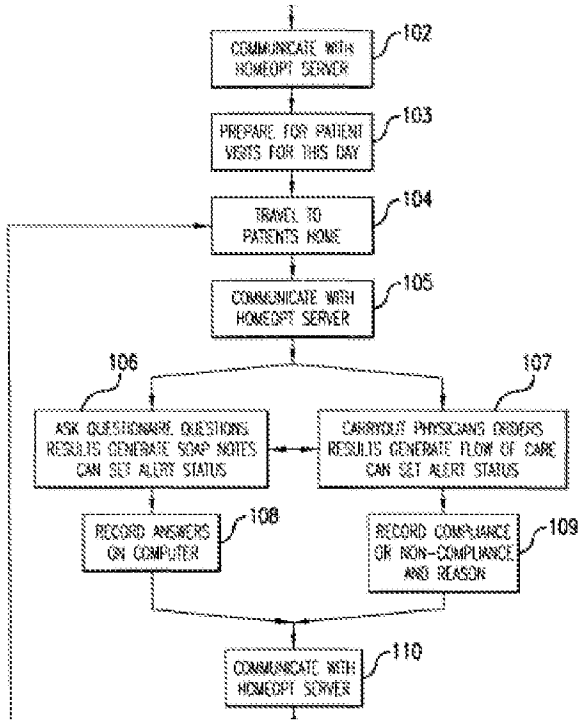
	and analysis of data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway and at least one, preferably a plurality of, subsequent decision data elements, corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the subsequent decision data elements within the clinical pathway database. This will allow the changing of the physical layout of the tree. In other words, it is possible to include totally new decision points, or totally remove decision points from a clinical pathway. This differs from existing systems which simply take a fixed tree and attempt to find individualized parameters within that tree. Benigno at 13:12-14:5
CLAIM 5	
5. A method for modifying a questionnaire used in data management according to the method of claim 1 including the steps of: (a) making at least one incremental change to a portion of the questionnaire;	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in

	communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2

	 Benigno at FIG. 1B
(b) tokenizing said at least one incremental change to said questionnaire;	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31

	Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(c) transmitting at least a portion of said tokens resulting from step (b) to a remote loosely networked computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19

	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of

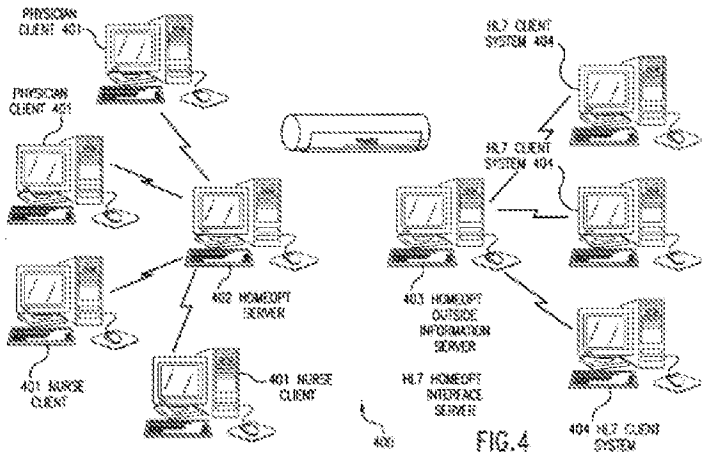
	care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30  Benigno at FIG 1A
(d) incorporating said transmitted tokens into said questionnaire at said loosely networked remote computing device, thereby modifying said questionnaire.	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval.

	Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.

	Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 6	
6. A method for managing data according to claim 1, wherein said first wireless modem or wireless LAN network connection and said second wireless modem or wireless LAN network connection are a same wireless modem or wireless LAN network connection.	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.

	Benigno at 47:6-13
CLAIM 7	
7. The method of claim 1 further including performing at least the steps (c)-(k) for at least two different remote computing device types using the same tokens.	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In a further embodiment, the present invention provides a system for assessing utilization of medical resources based upon manipulation and analysis of statistical data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and, for each of the previously selected subsequent decision data elements, a utilization value corresponding to the decision data element processing means, including a storage device, for performing the

	steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, and statistical processing means, in communication with the clinical pathway database and the historical clinical pathway database, for performing the steps of accessing the historical clinical pathway database, computing pathway utilization value based on the accessed utilization values in the database, generating at least one signal corresponding to the pathway utilization value, and outputting the at least one utilization value signal to a signal processing means. Benigno at 15:18-16:7 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24 In step 304, a new patient record is created, using for example the client computer 401 and the server 402. This record may be stored on the server 402, or at any other external location. In step 305, a criteria questionnaire is administered on the client computer 401, in order to determine whether the patient satisfies the criteria to be eligible for, for example, home health care. Examples of such criteria and conditions have been previously described elsewhere. Benigno at 49:10-15

	 Benigno at FIG. 4
CLAIM 8	
8. A method for managing data transfers between computers including the steps of:	A self-analyzing system for suggesting deviation from a current clinical pathway and entry into an alternative clinical pathway based upon historical information about the results of actions. Systems for tracking clinical pathway outcomes based on data collected post-treatment. …. A questionnaire computer language and subsystem are used in various stages of the systems of the invention. Corresponding methods are also disclosed. Benigno at Abstract
(a) creating a questionnaire at a first site in a first computer;	Assessment of the patient's condition is performed using a questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. Benigno at 9:31-10:2 Another aspect of the invention involves a new questionnaire format, which may be used as one way of collecting the data to be analyzed according to the present invention. This questionnaire format allows stable acute care caregivers the ability to closely track and instantly inform a patient's physician of that patient's condition. The format, as it applies to a particular patient, also provides the clinical pathway for the patient, as described *infra*. With the present invention, stable acute care providers receive updated orders about the patient on a visit by visit basis and physicians are able to track the progress of their patients instantly. The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are

	saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:17-31
(b) tokenizing said questionnaire, thereby producing a tokenized questionnaire;	In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*. … Question ID is the identifier of the question itself. Benigno at 19:10-24 One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(c) bringing a remote computer into electronic communication with said	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a

first computer;	suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13
(d) transmitting said tokenized questionnaire to said remote computer;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients

assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications.
Benigno at 6:26-29

The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting.
Benigno at 9:26-31

The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter.
Benigno at 11:14-19

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the

	actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(e) removing said remote computer from electronic communication with said first computer;	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard

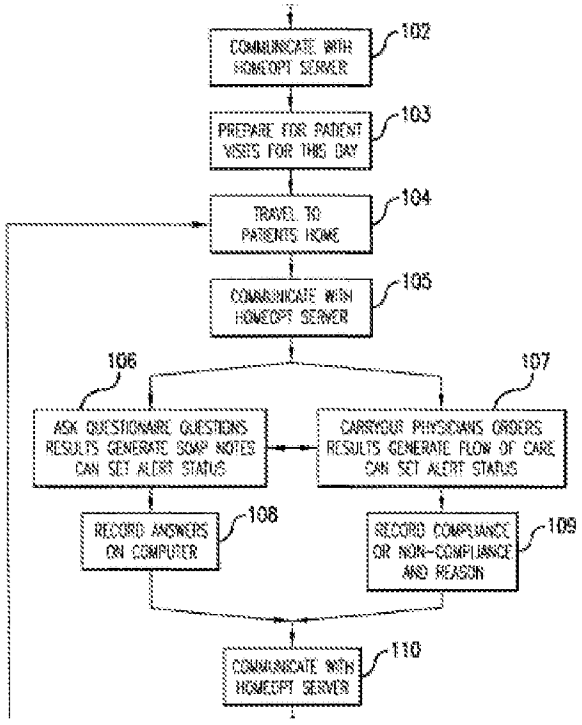
telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

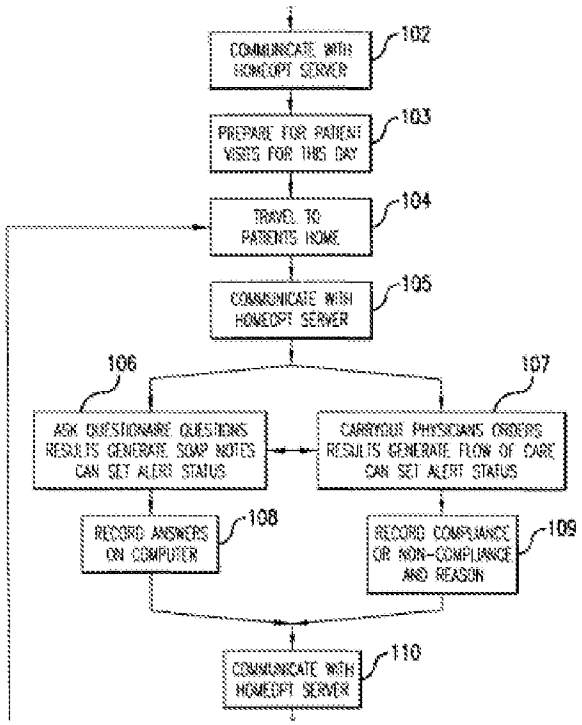
Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

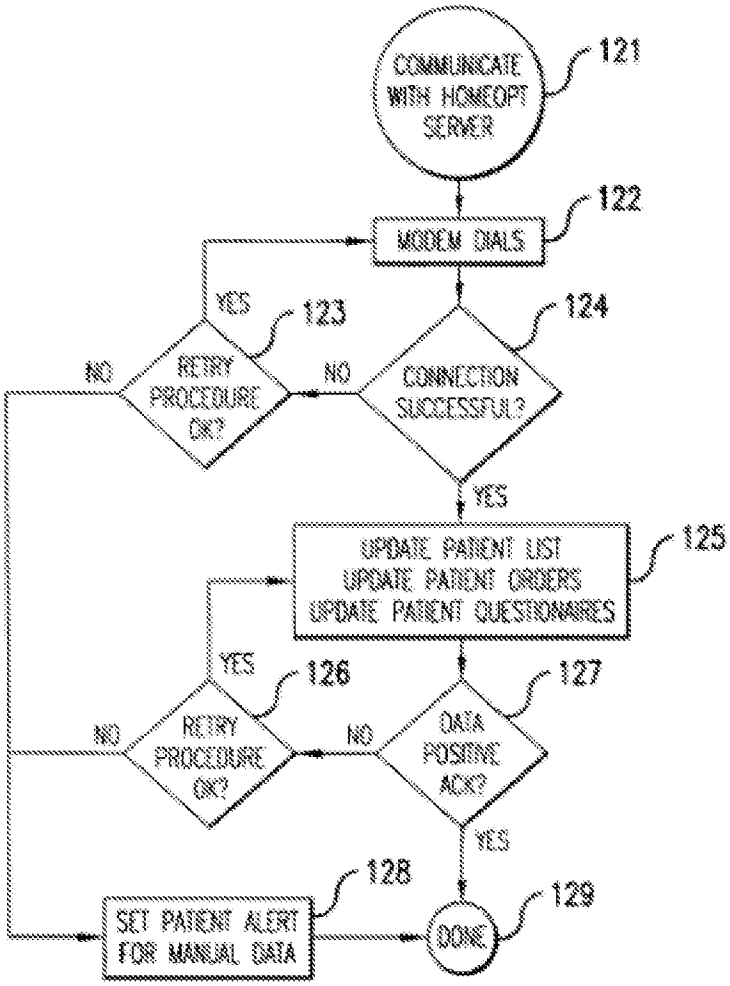
Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random.
Rappaport at 7:44-63

In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that

	have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(f) within said remote computer, using said transmitted tokenized questionnaire to obtain at least one user response;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 

(g) storing said at least one user response within said remote computer;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 
(h) modifying said questionnaire with incremental changes at a second computer located at a second site;	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as

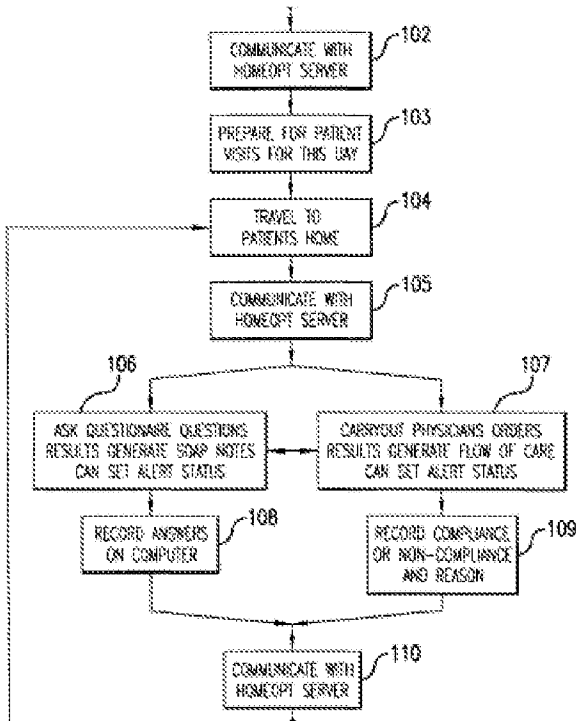
	correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2

	 Benigno at FIG. 1B
(i) placing said remote computer into electrical communication with said second computer;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out

orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

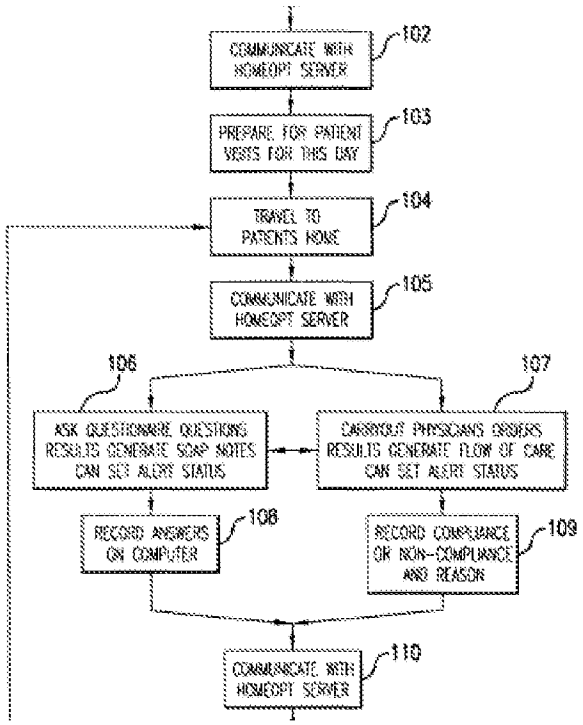
In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13



	Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(j) transmitting said incremental changes from said second computer to said remote computer;	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link.

	Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is

	encountered. Benigno at 47:29-30  Benigno at FIG 1A
(k) modifying said transmitted tokenized questionnaire in said remote computer with said incremental changes, thereby creating a modified tokenized questionnaire;	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal

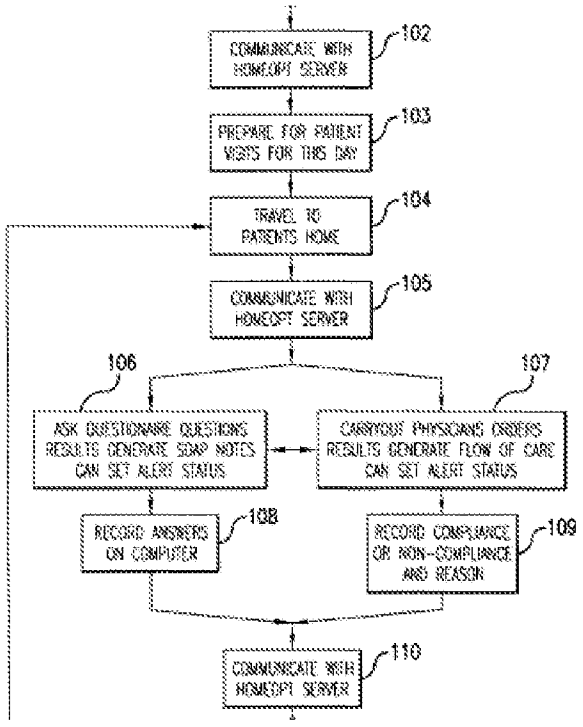
	corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401

	by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(l) removing said remote computer from electronic communication with said second computer;	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may

	be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(m) within said remote computer, using said modified tokenized questionnaire to obtain at least one additional user response;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Benigno at 46:16-20
(n) placing said remote computer into electronic communication with a server;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13



Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the

	actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(o) transmitting said at least one user response to said server;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28
(p) transmitting said at least one additional user response to said server;	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Benigno at 46:16-20
(q) storing said transmitted at least one user response and said at least one additional user response at said server;	The questionnaire and its answers are all stored. Benigno at 23:10 In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402.

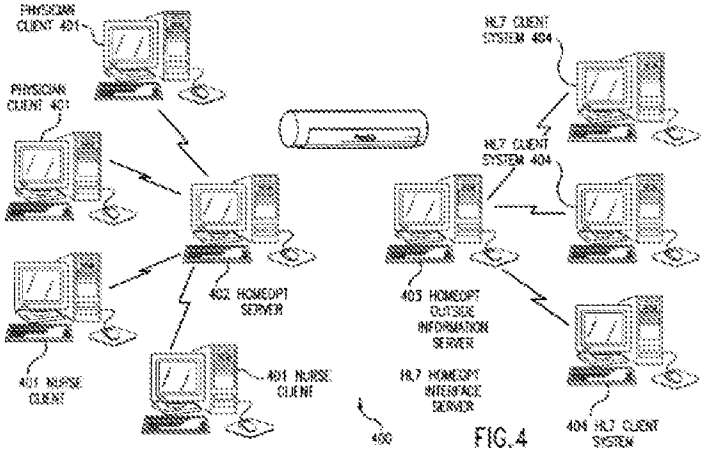
	Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28
(r) preparing a report using any of said at least one user response and said at least one additional user response; and,	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
(s) displaying at least a portion of said report on a visually perceptible medium;	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
(t) performing at least steps (d)-(p) using at least two different remote computing device types using the same tokens.	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate

application times and such can be encoded within the question that asks if the drug is to be administered.
Benigno at 13:1-10

In a further embodiment, the present invention provides a system for assessing utilization of medical resources based upon manipulation and analysis of statistical data related to clinical pathways, comprising a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to available subsequent decision points within the clinical pathway, a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and, for each of the previously selected subsequent decision data elements, a utilization value corresponding to the decision data element processing means, including a storage device, for performing the steps of selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, and statistical processing means, in communication with the clinical pathway database and the historical clinical pathway database, for performing the steps of accessing the historical clinical pathway database, computing pathway utilization value based on the accessed utilization values in the database, generating at least one signal corresponding to the pathway utilization value, and outputting the at least one utilization value signal to a signal processing means.
Benigno at 15:18-16:7

In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*.
…
Question ID is the identifier of the question itself.
Benigno at 19:10-24

In step 304, a new patient record is created, using for example the client computer 401 and the server 402. This record may be stored on the server 402, or at any other external location. In step 305, a criteria questionnaire is administered on the client computer 401, in order to determine whether the patient satisfies the criteria to be eligible for, for example, home health care. Examples of such criteria and

	conditions have been previously described elsewhere. Benigno at 49:10-15  FIG.4 Benigno at FIG. 4
CLAIM 9	
9. The method for managing data transfers between computers according to claim 8 wherein said first computer and said second computer are a same computer.	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is

	reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 10	
10. The method for managing data transfers between computers according to claim 9 wherein said server and said first computer are said same computer.	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out

	orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 11	
11. A method for collecting survey data from a user comprising	A self-analyzing system for suggesting deviation from a current clinical pathway and entry into an alternative clinical pathway based upon historical information about the results of actions. Systems for

the steps of:	tracking clinical pathway outcomes based on data collected post-treatment. …. A questionnaire computer language and subsystem are used in various stages of the systems of the invention. Corresponding methods are also disclosed. Benigno at Abstract
(a) creating a questionnaire comprising a series of questions;	Assessment of the patient's condition is performed using an questionnaire or form generated based upon the current patient's customized and changeable clinical pathway. Benigno at 9:31-10:2 Another aspect of the invention involves a new questionnaire format, which may be used as one way of collecting the data to be analyzed according to the present invention. This questionnaire format allows stable acute care caregivers the ability to closely track and instantly inform a patient's physician of that patient's condition. The format, as it applies to a particular patient, also provides the clinical pathway for the patient, as described *infra.* With the present invention, stable acute care providers receive updated orders about the patient on a visit by visit basis and physicians are able to track the progress of their patients instantly. The questionnaire system in conjunction with the other components of the systems of the invention allows the close communication required between home care givers and physicians in this kind of situation and solves various problems of the prior art. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:17-31
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31

	Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra)*. … Question ID is the identifier of the question itself. Benigno at 19:10-24
(c) storing said plurality of tokens on a computer readable medium on a first computer;	Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires. Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10
(d) placing a handheld remote computing device into electronic communication with said first computer;	The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data

	storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19 In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13
(e) transmitting said plurality of tokens to said handheld remote computing device;	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19

In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link.
Benigno at 46:4-9

In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data.
Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the

	updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(f) taking said handheld remote computing device out of electronic communication with said first computer;	In step 102, the nurse, 5 using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines,

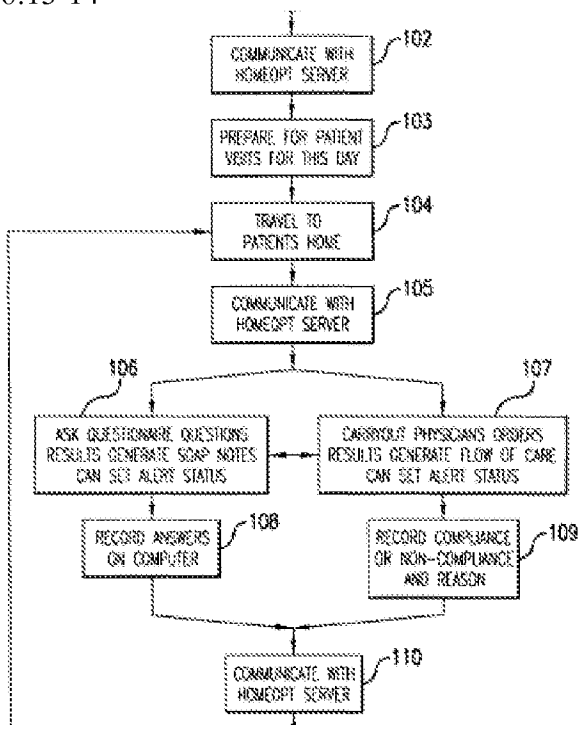
via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

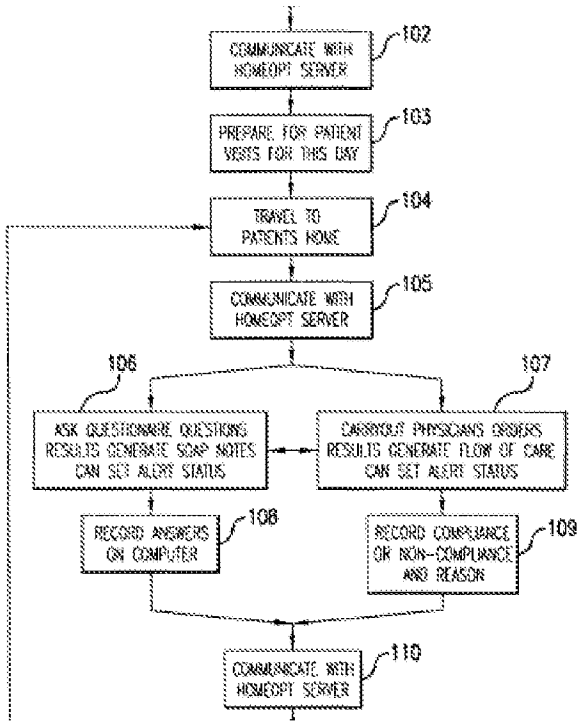
Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-Ch active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random.
Rappaport at 7:44-63

In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially

	undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(g) after said handheld remote computing device has been taken out of electronic communication with said first computer,	In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14  Benigno at FIG 1A
(g1) executing at least a portion of said plurality of tokens representing said questionnaire on said handheld remote computing device to collect a response from a user, and,	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders.

	If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28  Benigno at FIG 1A
(g2) storing within said remote computing device said response from the user;	In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:25-28
(h) placing said handheld remote computing device into electronic communication with a second computer;	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or

105 from the server 402 to the client computer 401.
Benigno at 46:22-24

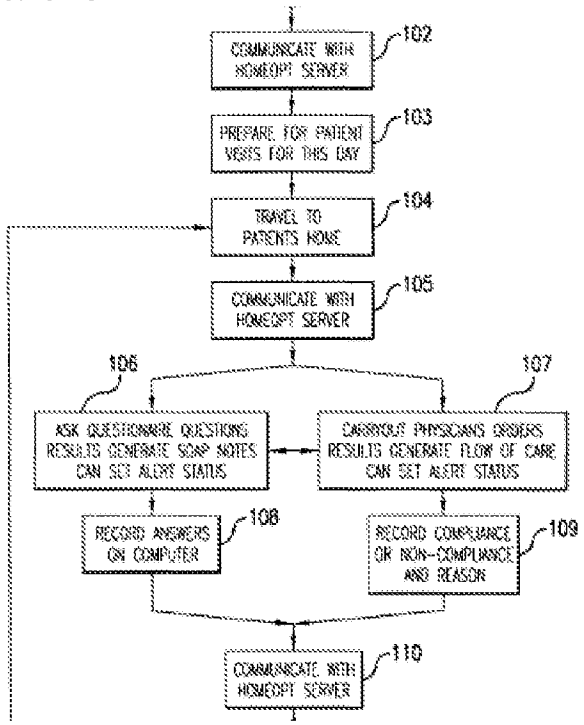
In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402.
Benigno at 47:20-27

In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered.
Benigno at 47:29-30

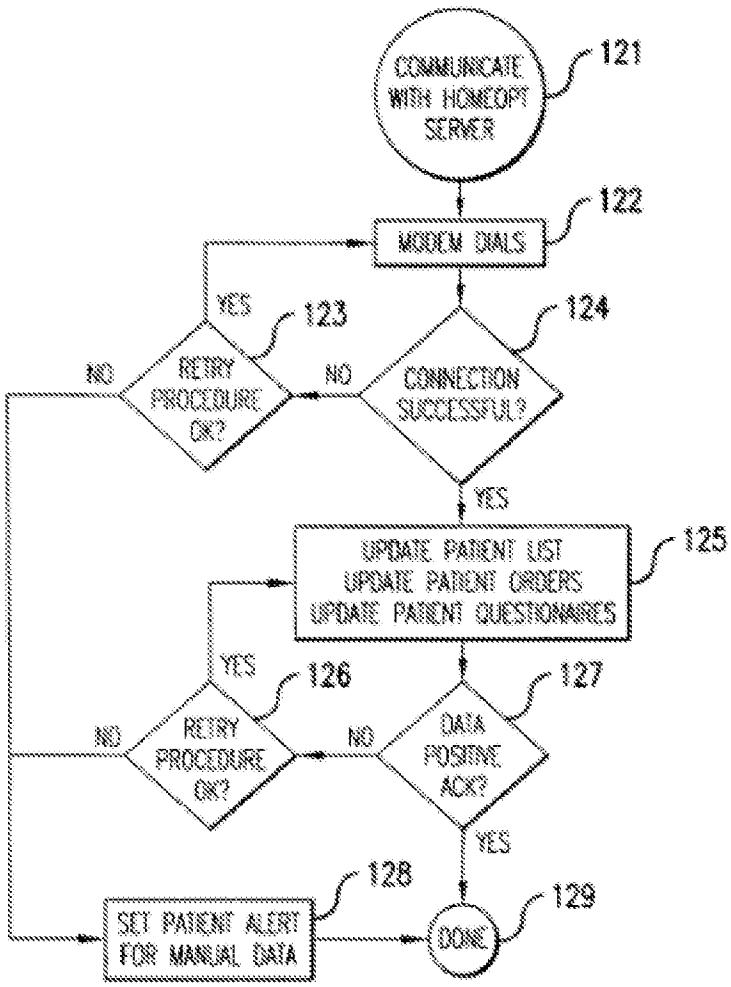
Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the

	updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
(i) transmitting at least a portion of said response stored within said handheld remote computing device to said second computer; and,	In step 106 and 108, the client computer 401, via the questionnaire language previously described, or through any other data collection mechanism, may obtain data from the nurse or other source corresponding to the clinical pathway to be followed, as dictated by the physician. As a result, SOAP notes may be generated, alerts can be generated, etc., for ultimate retransmission to the server 402. Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401. The results of such orders may generate a flow of care to be followed by the nurse, and/or may generate alerts, etc. In step 109, the nurse records in the client computer 401 compliance or non-compliance with the orders. If noncompliance, the reasons are also stored. gain, all such stored data may later be transmitted back to the server 402. Benigno at 46:16-28 

	Benigno at FIG 1A In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4
(j) forming a visually perceptible report from any of said at least a portion of said response so transmitted.	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
CLAIM 12	
12. A method for collecting survey data from a user according to claim 11, wherein step (j) comprises the step of printing a report from any of said response to transmitted.	The system includes means for … outputting the signal to a signal processing means. Suitable signal processing means include, a communication network, a computer, a storage medium, a display, a printer, or the like. Benigno at 28:26-29:1
CLAIM 13	
13. A method for collecting survey data from a user according to claim 11, wherein said first computer and said second computer are a same computer.	In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link. Benigno at 46:4-9 In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data. Benigno at 46:13-14 Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or

	105 from the server 402 to the client computer 401. Benigno at 46:22-24 In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached. Benigno at 46:30-47:4 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc. Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30
CLAIM 14	
14. A method for modifying a questionnaire used in data management	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes.

according to the method of claim 11, further comprising the steps of: (k) making at least one incremental change to a portion of said questionnaire;	Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval. Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation.

	Benigno at 14:7-15:2  Benigno at FIG. 1B
(l) tokenizing said at least one incremental change to said questionnaire;	One significant benefit of the invention is that the data gathered about various clinical pathways and their successfulness can be catalogued. The data can be repackaged and manipulated as needed and is believed to be of significant value in and of itself. The gathering of this data as it pertains to the heretofore nonexistent stable acute care patient class is an important advantage of the invention. Benigno at 10:14-18. Statements of the language used to create each questionnaire are saved in the clinical pathway database as opposed to a simple flat file. Entire questionnaires are versioned, and may be easily modified, or recalled from earlier versions. Questions once entered may be reused in many questionnaires.

	Benigno at 12:27 -31 Each individual question within the questionnaire may be represented by statements in a "questionnaire language". This language is "turing complete" meaning that anything that can be accomplished by any general purpose programming language may be accomplished by the language that represents the questions. This allows the questions to contain data, storage, and logical information about the data within each question, and allows the attachment of significant information to each question within the questionnaire. An example would be information associated with a particular drug. Dosages, appropriate application times and such can be encoded within the question that asks if the drug is to be administered. Benigno at 13:1-10 In one embodiment of the present invention, clinical pathway database models a decision tree comprising various decision nodes. These nodes are stored as either text or tokenized representations of the Questionnaire Language ("QL") statements *(see infra).* … Question ID is the identifier of the question itself. Benigno at 19:10-24
(m) transmitting at least a portion of said tokens resulting from step (k) to said remote handheld computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	Therefore, it would be highly desirable to have a system permitting the capability to provide home care and direct information communication to the physician and his or her staff in real time, so as to reduce the recovery period and the risk of complications. Benigno at 6:26-29 The nurse or caregiver then sees the patient almost immediately at home and tracks the patient at home one or more times per day using the system and the information is used to create and update the clinical pathway database records for the patient. Real-time communication systems of the invention allow supervision by the physician, while not requiring the supervision to occur in a hospital setting. Benigno at 9:26-31 The communications subsystems of the invention are important to its capability of providing stable acute care and tracking clinical pathways. Point of service communication at home using either a suitable electronic or computerized device is provided by the invention. The computer can be put into communication with a data storage / server computer via any suitable means, including a modem or network adapter. Benigno at 11:14-19

In step 102, the nurse, using the client computer 401 (Figure 4) communicates with the server 402, in order to obtain updated pathway instructions, etc., regarding what steps to perform during visit(s) for one or more patient(s). The communication can take place via modern and standard phone lines, via wireless transmission (e.g., cellular, etc.), via the Internet, or via any other communication link.
Benigno at 46:4-9

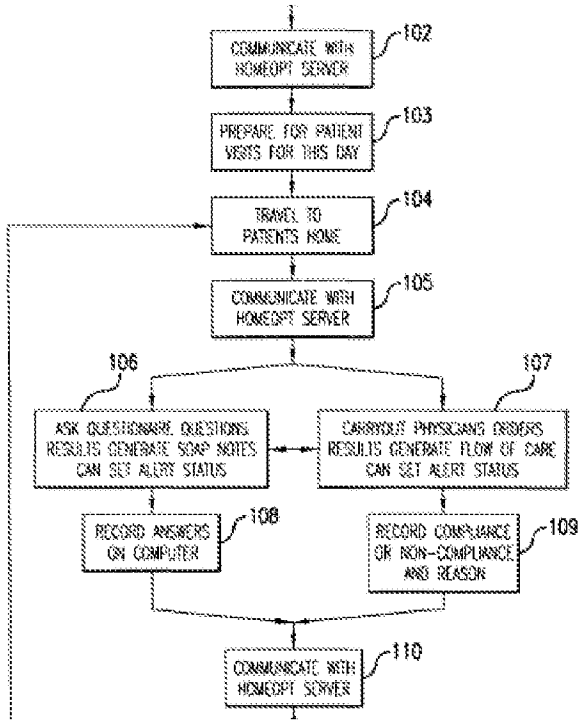
In step 105, the nurse, through client computer 401, may again communicate with server 402, in order to obtain the most current instructions and data.
Benigno at 46:13-14

Alternatively, or in addition, in step 107 the nurse may carry out orders created by the physician and transmitted in steps 102 and/or 105 from the server 402 to the client computer 401.
Benigno at 46:22-24

In step 110, the client computer 401 communicates with the server 402, in order to update both the computer 401 and server 402 as in steps 102 and 105. In step 111, if there are additional patients assigned to the nurse, as would be indicated on a list maintained on the computer 401 (as communicated from the server 402), then steps 104-110 may be repeated for each of the remaining patients. After all patients have been processed by the nurse, the final step 112 is reached.
Benigno at 46:30-47:4

Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.
Benigno at 47:6-13

Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the

	updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30  Benigno at FIG 1A
(n) incorporating said transmitted tokens into said questionnaire at said remote computing device, thereby incrementally changing said questionnaire.	Daily communication includes SOAP notes, notification of whether the patient received appropriate IV medications and intravenous fluids, as well as the ability to communicate with nurses, and nurse communications with physicians for order changes. Benigno at 11:22-26 The system is constantly evaluating itself. As the system finds new correlating factors, they are put in place to aid in determining changes to be made to the current or default clinical pathway. In addition, as correlations are determined between clinical pathway decisions and significant outcomes *(i.e.,* outcomes of interest), changes can be made to the default pathway to optimize systematically the clinical pathway toward the desired results. These changes can be automatically made or can be presented to the physician, system administrator, or other user for approval.

	Benigno at 21:22-29 In addition, the present invention provides a client / server system for manipulation and analysis of data related to clinical pathways, comprising a communication network, a client workstation in communication with the communication network, wherein the client workstation comprises means for generating at least one signal corresponding to a clinical pathway decision and transmitting the at least one decision signal over the communication network, and means for receiving at least one signal corresponding to a clinical pathway modification from the communication network, and means for outputting the at least one modification signal to a signal processing means, a server on the communication network, wherein the server comprises a clinical pathway database for storing an initial procedure decision data element, corresponding to a decision point within the clinical pathway, and at least one subsequent decision data element corresponding to at least one available subsequent decision point within the clinical pathway, and a historical clinical pathway database for storing previously selected subsequent decision data elements, selected corresponding to the initial procedure decision data element, and processing means, in communication with the communication network, the client workstation, and the server, for performing the steps of receiving the at least one decision signal from the communication network, based on the received decision signal, selecting one of the at least one subsequent decision data elements, comparing the selected subsequent decision data element with the previously selected subsequent decision data elements stored in the historical clinical pathway database, and based upon predetermined correlation criteria, modifying the at least one subsequent decision data elements within the clinical pathway database, then generating at least one signal corresponding to a clinical pathway modification of the subsequent decision data elements in the clinical pathway database, and transmitting the at least one clinical pathway modification signal over the communication network to the receiving means of the client workstation. Benigno at 14:7-15:2 Steps 102, 105 and 110, wherein the client computer 401 communicates with the server 402, are each described in further detail in steps 121-129, depicted in Figure lB. In step 121, the processes commences. In step 122, the modem on the client computer 401 dials into the server 402. Again, this assumes that the computer 401 and server 402 are to be connected via modem and standard telephone lines. Again, it will be understood that this connection may be accomplished in a variety of ways, including over telephone lines, via a wireless connection (cellular or otherwise), via the Internet, etc.

	Benigno at 47:6-13 Assuming the connection between the client computer 401 and server 402 is successful in step 124, then in step 125 the patient list, patient orders and patient questionnaire is updated. Specifically, the client computer 401 sends information to the server 402 regarding the actions that the nurse has taken (as input into the client computer 401 by the nurse), and the server 402 sends to the client computer 401 the updated patient list, patient orders, patient questionnaires, flow of care, etc. Other data as appropriate may also be transmitted back and forth between the client computer 401 and the server 402. Benigno at 47:20-27 In step 127, if the data has been correctly exchanged between the client computer 401 and server 402, then final step 129 is encountered. Benigno at 47:29-30

F. CLAIMS 1, 2, 5-7, AND 11-14 OF THE '816 PATENT ARE RENDERED OBVIOUS BY WRIGHT, RAPPAPORT, WARTHEN, BROOKLER, AND ROSSMANN AND THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

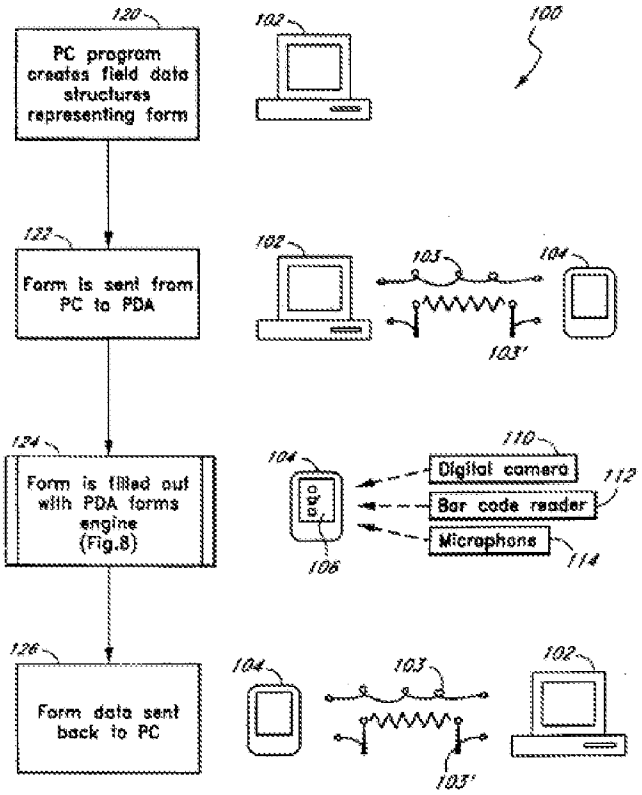
Please see the below claim chart that applies the teachings of Wright in view of Rappaport, Warthen, Brookler, and Rossmann to claims 1, 2, 5-7, and 11-14 of the '816 patent. Requester also would like to inform the Office that a similar rejection to the one provided below is proposed by an Examiner in a non-final Office Action in the '816's child application currently pending as U.S. Application No. 12/910,706.

Reasons to Combine:

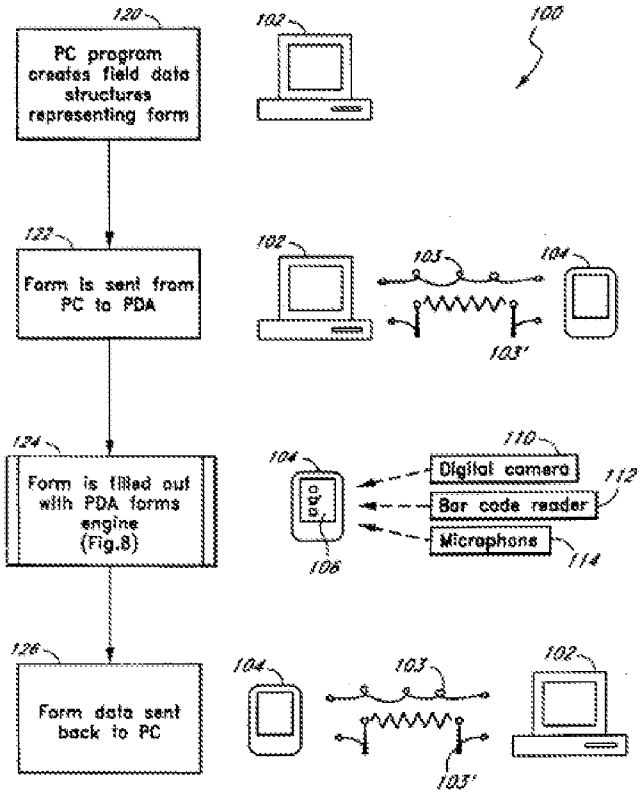
A person of skill in the art would be motivated to combine the teachings as provided below for the following reasons. Wright teaches the use of surveys and Warthen teaches it was known in the art to tokenize a survey and it would lead to a predictable result providing electronic surveys with feedback. *See* Wright at Abstract; Warthen at Abstract. It would be further obvious to add the teachings of Brookler since Brookler teaches transmitting and storing responses, so as to provide the predictable result of being able to store all answers to survey questions on the server. This would provide a single central location for all results allowing for ease of access by users conducting a survey. *See* Brookler at para. 0002. It also would have been obvious to combine Wright, Warthen and Brookler with Rappaport so that when a connection

fails, as will predictably happen, the device can reconnect and send the information upon reconnection. This would motivate a person of skill in the art to make the combination since disconnections are a common occurrence and Rappaport teaches a method of reconnection. *See* Rappaport at Abstract. Finally, it would have been obvious to a person of ordinary skill in the art that users of a system that collects questionnaires would need the ability to print reports based on the completed questionnaires. This would motivate the further combination with Rossmann since it provides a predictable method for printing accumulated results.

CLAIM 1	**Teachings from Wright in view of Warthen, Rappaport, Brookler, and Rossmann**
1. A method for managing data including the steps of:	Once an electronic form is loaded in the PDA 104 (FIG. 1), a data collector or interviewer in a survey or questionnaire type of application, can choose to fill out any of a number of forms which have been previously loaded. The number of forms that can be loaded depends on the amount of random-access memory (RAM) (not shown) in the PDA 104. Current PDA devices can generally store large numbers of reasonably small forms in the standard RAM. Users complete or fill out a form during execution of the forms engine function 124. Once form execution begins, the interviewer has very little to do when compared to the paper based process. Because the scripts, running under the forms engine, control form execution, the user doesn't need to follow any complex skip patterns or even worry about answering a question incorrectly. Aside from answering the current question, he/she can select one of four functions by tapping on buttons (FIG. 3): go to the NEXT field 220, go to PREVIOUS field 222, get HELP 224, or QUIT 226. When the NEXT button 220 is pressed, the field script is executed. At this point, the PDA 104 running the script may check to see that the field was answered correctly and if so, go to the next appropriate field. If not, the script may cause the PDA 104 to beep and display a help message, or perform some other action. The forms engine 124 tracks the progress as the user progresses through the form. At any point while completing the form, the user may tap the PREVIOUS button 222 to go back to change an answer to a previous question. Also, the user may tap the HELP button 224 at any time for instructions for the current field. Wright at 13:38-67

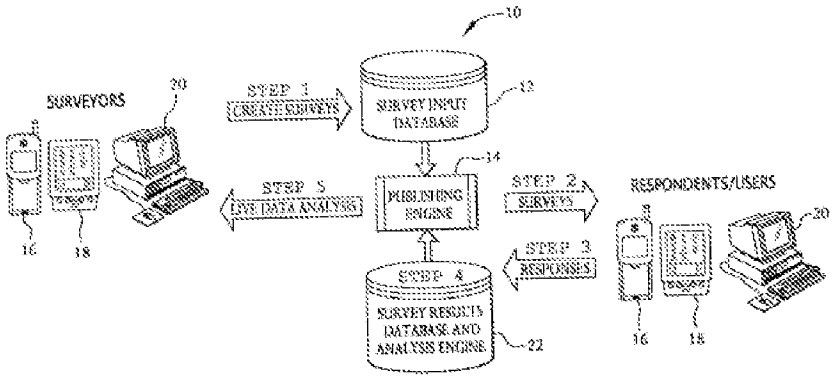
	 Fig. 1
(a) creating a questionnaire comprising a series of questions;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting.

	Wright at ABSTRACT Once an electronic form is loaded in the PDA 104 (FIG. 1), a data collector or interviewer in a survey or questionnaire type of application, can choose to fill out any of a number of forms which have been previously loaded. The number of forms that can be loaded depends on the amount of random-access memory (RAM) (not shown) in the PDA 104. Current PDA devices can generally store large numbers of reasonably small forms in the standard RAM. Users complete or fill out a form during execution of the forms engine function 124. Once form execution begins, the interviewer has very little to do when compared to the paper based process. Because the scripts, running under the forms engine, control form execution, the user doesn't need to follow any complex skip patterns or even worry about answering a question incorrectly. Aside from answering the current question, he/she can select one of four functions by tapping on buttons (FIG. 3): go to the NEXT field 220, go to PREVIOUS field 222, get HELP 224, or QUIT 226. When the NEXT button 220 is pressed, the field script is executed. At this point, the PDA 104 running the script may check to see that the field was answered correctly and if so, go to the next appropriate field. If not, the script may cause the PDA 104 to beep and display a help message, or perform some other action. The forms engine 124 tracks the progress as the user progresses through the form. At any point while completing the form, the user may tap the PREVIOUS button 222 to go back to change an answer to a previous question. Also, the user may tap the HELP button 224 at any time for instructions for the current field. Wright at 13:38-67

	 Fig. 1
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting.

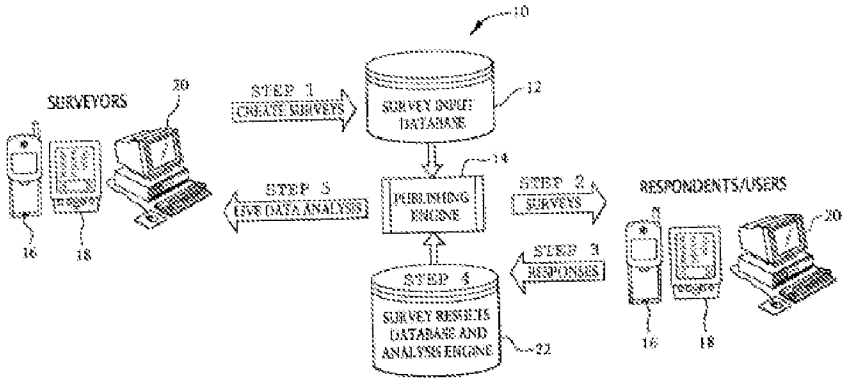
	Wright at ABSTRACT An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at 2:1-11
(c) establishing a first wireless modem or wireless LAN network connection with a remote computing device;	The present invention is directed to a system and method that allows mobile platforms each supporting any of a variety of call types, and each having differing mobility characteristics, to maintain connectivity to a backbone network in spite of unreliable radio links that occasionally fail. It accomplishes this by using automatic and user-transparent reconnection attempts for appropriate call sessions when an interruption of the link occurs. The network may be supporting a variety of different call types simultaneously. Access to network connectivity resources can be provided according to call session priority based on (for example, call session type, platform mobility, hand-off status, and user class (fee-for-service)) criteria. The technology allows support of suspended sessions and uses repeated reconnection attempts with priority access to network resources. It also

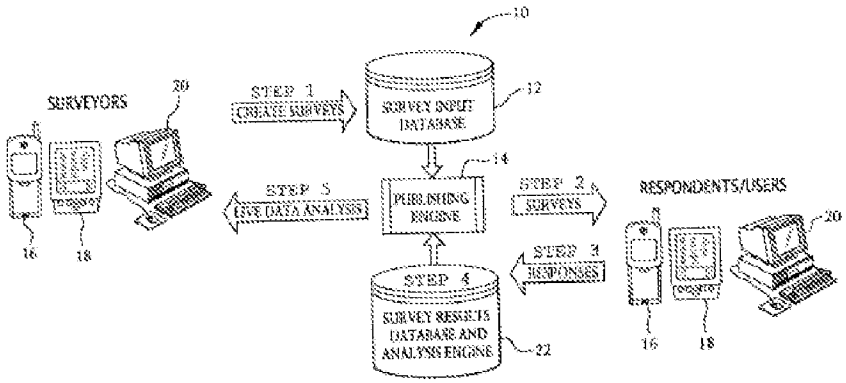
	provides for hand-offs of suspended sessions to neighboring gateways as mobile terminals move throughout the service area. In a network that uses this technology, for example, voice calls (typical of time-sensitive stream traffic) may preempt resources of time-insensitive data calls causing suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at ABSTRACT In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(d) transmitting said plurality of tokens to a remote computing device via said first wireless modem or wireless LAN network connection;	Step 5: Analyzed Data Publishing and Reporting: Once the data has been analyzed in accordance with parameters prescribed by the surveyor, reports and results are published by publishing engine 14. As specified by the surveyor, publishing engine 14 makes the survey results and reports available for access by the surveyor via one or more interface devices (e.g., cell phone 16, PDA 18 or PC 20). The survey results may be "pushed" by the survey publishing system server to the surveyor in the manner known in the art. Alternatively, and preferably, the survey results and reports may passively reside on the survey publishing system server where they may be "pulled" or retrieved by the surveyor. In the latter case, survey publishing system 10 may be programmed to notify the surveyor via electronic mail message or otherwise that the survey results are available for access. It will be understood that publishing engine 14 will publish different levels and depth of data according to the interface device specified by the surveyor to receive the data, e.g., a cell phone will only get high level reports, whereas a PC will receive detailed analysis. Brookler at [0033]

	 FIG. 1 HTTP server 749 uses UDP interface module 748 to send data to and receive data from CDPD network 710. TIL decks 760 are TIL decks that can be accessed by HTTP server 749. Static files containing PIDL decks are converted to TIL decks only once on HTTP server 749. CGI programs 761 are common gateway interface programs that produce PIDL decks that are used by HTTP server 749 to produce TIL decks that in turn are transmitted via UDP interface modules 748 and 714 and cellular telephone network 710 to client module 702. In this embodiment, the services available 35 over airnet network 750 are applications accessible by HTTP server 749 on Internet 140 for which a service developer has written a PIDL deck, or a CGI script that in turn generates a PIDL deck, and is stored on computer 743. Rappaport at 16:30-36.
(e) terminating said first wireless modem or wireless LAN network connection with said remote computing device;	Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-C_h active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random.

	Rappaport at 7:44-63 In contrast, mobile users that are engaged in mobile computing (or other forms of data transmission) may have the capability to operate semi-autonomously since data communications with the network are packetized and not necessarily streamed. So with appropriate network design, a temporary disconnection from the network may be transparent to the user. Thus, by implementing the techniques described herein, short term radio link disconnections, which are frequent in mobile communications, need not result in failed sessions, discarded information and wasted use of resources. Rappaport at 5:2-15 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(f) after said first wireless modem or wireless LAN network connection is terminated, executing at least a portion of said plurality of tokens representing said questionnaire at said remote computing device to collect a response from a user;	Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-C_h active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In contrast, mobile users that are engaged in mobile computing (or other

	forms of data transmission) may have the capability to operate semi-autonomously since data communications with the network are packetized and not necessarily streamed. So with appropriate network design, a temporary disconnection from the network may be transparent to the user. Thus, by implementing the techniques described herein, short term radio link disconnections, which are frequent in mobile communications, need not result in failed sessions, discarded information and wasted use of resources. Rappaport at 5:2-15
(g) establishing a second wireless modem or wireless LAN network connection between said remote computing device and a server;	The present invention is directed to a system and method that allows mobile platforms each supporting any of a variety of call types, and each having differing mobility characteristics, to maintain connectivity to a backbone network in spite of unreliable radio links that occasionally fail. It accomplishes this by using automatic and user-transparent reconnection attempts for appropriate call sessions when an interruption of the link occurs. The network may be supporting a variety of different call types simultaneously. Access to network connectivity resources can be provided according to call session priority based on (for example, call session type, platform mobility, hand-off status, and user class (fee-for-service)) criteria. The technology allows support of suspended sessions and uses repeated reconnection attempts with priority access to network resources. It also provides for hand-offs of suspended sessions to neighboring gateways as mobile terminals move throughout the service area. In a network that uses this technology, for example, voice calls (typical of time-sensitive stream traffic) may preempt resources of time-insensitive data calls causing suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at ABSTRACT Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than $C\text{-}C_h$ active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data

	session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63
(h) after said second wireless modem or wireless LAN network connection is established, transmitting at least a portion of said response from the user to said server via said second wireless modem or wireless LAN network connection; and	Step 5: Analyzed Data Publishing and Reporting: Once the data has been analyzed in accordance with parameters prescribed by the surveyor, reports and results are published by publishing engine 14. As specified by the surveyor, publishing engine 14 makes the survey results and reports available for access by the surveyor via one or more interface devices (e.g., cell phone 16, PDA 18 or PC 20). The survey results may be "pushed" by the survey publishing system server to the surveyor in the manner known in the art. Alternatively, and preferably, the survey results and reports may passively reside on the survey publishing system server where they may be "pulled" or retrieved by the surveyor. In the latter case, survey publishing system 10 may be programmed to notify the surveyor via electronic mail message or otherwise that the survey results are available for access. It will be understood that publishing engine 14 will publish different levels and depth of data according to the interface device specified by the surveyor to receive the data, e.g., a cell phone will only get high level reports, whereas a PC will receive detailed analysis. Brookler at [0033]  FIG. 1
(i) storing said transmitted response at said server.	Step 5: Analyzed Data Publishing and Reporting: Once the data has been analyzed in accordance with parameters prescribed by the surveyor, reports and results are published by publishing engine 14. As specified by the surveyor, publishing engine 14 makes the survey results and reports

	available for access by the surveyor via one or more interface devices (e.g., cell phone 16, PDA 18 or PC 20). The survey results may be "pushed" by the survey publishing system server to the surveyor in the manner known in the art. Alternatively, and preferably, the survey results and reports may passively reside on the survey publishing system server where they may be "pulled" or retrieved by the surveyor. In the latter case, survey publishing system 10 may be programmed to notify the surveyor via electronic mail message or otherwise that the survey results are available for access. It will be understood that publishing engine 14 will publish different levels and depth of data according to the interface device specified by the surveyor to receive the data, e.g., a cell phone will only get high level reports, whereas a PC will receive detailed analysis. Brookler at [0033]  FIG. 1
CLAIM 2	
2. The method for managing data of claim 1 further comprising the step of: (j) translating said response to a format recognizable by a particular computer program; and	According to a presently preferred embodiment, data collected during the survey building or creation process is stored in the survey input database 12 and translated to XML for optimal portability vis-a-vis presently available interface devices. Using publishing engine 14, the surveyor may opt to publish the survey immediately after creation and simultaneously to all types of devices. In the alternative, the surveyor may choose to delay the launch of the surveyor stagger the times at which the survey information is published to the various interface devices selected for participation in the survey. By way of example, publishing engine 14 may at present be configured to publish to cell phones using the wireless application protocol (WAP) (which incorporates WML), short messaging service (SMS) using the global system for mobile communication (GSM) or VoiceXML. Likewise, publishing engine may also publish to computer browsers via HTML and to Palm® devices or other PDAs using PalmOS or other suitable PDA operating systems (or SMS) depending on where the surveyor wishes the poll to be published.

	Brookler at [0051] A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT
(k) accessing the translated response from a computer executing said particular computer program.	According to a presently preferred embodiment, data collected during the survey building or creation process is stored in the survey input database 12 and translated to XML for optimal portability vis-a-vis presently available interface devices. Using publishing engine 14, the surveyor may opt to publish the survey immediately after creation and simultaneously to all types of devices. In the alternative, the surveyor may choose to delay the launch of the surveyor stagger the times at which the survey information is published to the various interface devices selected for participation in the survey. By way of example, publishing engine 14 may at present be configured to publish to cell phones using the wireless application protocol (WAP) (which incorporates WML), short messaging service (SMS) using the global system for mobile communication (GSM) or VoiceXML. Likewise, publishing engine may also publish to computer browsers via HTML and to Palm® devices or other PDAs using PalmOS or other suitable PDA operating systems (or SMS) depending on where the surveyor wishes the poll to be published. Brookler at [0051] A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting

	feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT
CLAIM 5	
5. A method for modifying a questionnaire used in data management according to the method of claim 1 including the steps of: (a) making at least one incremental change to a portion of the questionnaire;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if

	the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
(b) tokenizing said at least one incremental change to said questionnaire;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a

	handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT

(c) transmitting at least a portion of said tokens resulting from step (b) to a remote loosely networked computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an

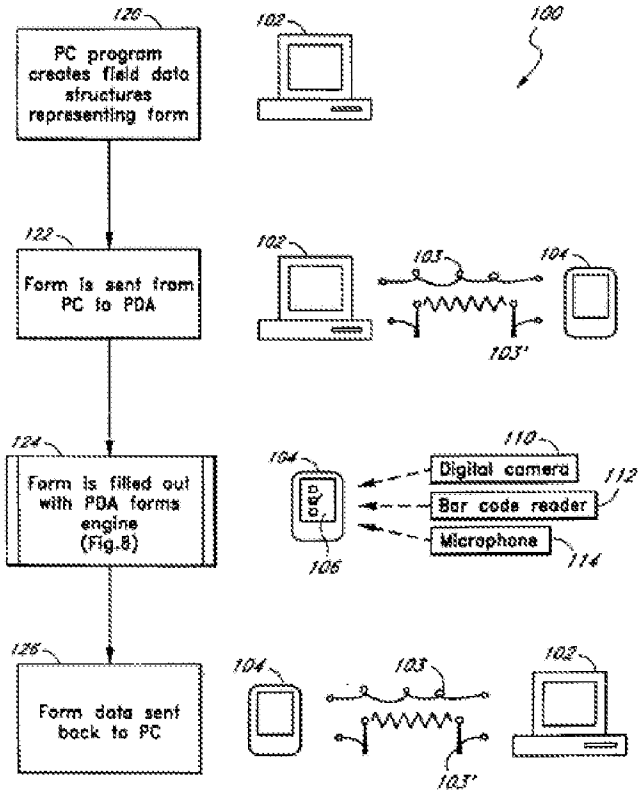
	answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
(d) incorporating said transmitted tokens into said questionnaire at said loosely networked remote computing device, thereby modifying said questionnaire.	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10.

	Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
CLAIM 6	
6. A method for managing data according to claim 1, wherein said first wireless modem or wireless LAN network connection and said second wireless modem or wireless LAN network connection are a same wireless modem or wireless LAN network connection.	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is

	completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
CLAIM 7	
7. The method of claim 1 further including	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting

performing at least the steps (c)-(k) for at least two different remote computing device types using the same tokens.	feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a

	matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at 2:1-11
CLAIM 11	
11. A method for collecting survey data from a user comprising the steps of:	Once an electronic form is loaded in the PDA 104 (FIG. 1), a data collector or interviewer in a survey or questionnaire type of application, can choose to fill out any of a number of forms which have been previously loaded. The number of forms that can be loaded depends on the amount of random-access memory (RAM) (not shown) in the PDA 104. Current PDA devices can generally store large numbers of reasonably small forms in the standard RAM. Users complete or fill out a form during execution of the forms engine function 124. Once form execution begins, the interviewer has very little to do when compared to the paper based process. Because the scripts, running under the forms engine, control form execution, the user doesn't need to follow any complex skip patterns or even worry about answering a question incorrectly. Aside from answering the current question, he/she can select one of four functions by tapping on buttons (FIG. 3): go to the NEXT field 220, go to PREVIOUS field 222, get HELP 224, or QUIT 226. When the NEXT button 220 is pressed, the field script is executed. At this point, the PDA 104 running the script may check to see that the field was answered correctly and if so, go to the next appropriate field. If not, the script may cause the PDA 104 to beep and display a help message, or perform some other action. The forms engine 124 tracks the progress as the user progresses through the form. At any point while completing the form, the user may tap the PREVIOUS button 222 to go back to change an answer to a previous question. Also, the user may tap the HELP button 224 at any time for instructions for the current field. Wright at 13:38-67

	 Fig. 1
(a) creating a questionnaire comprising a series of questions;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer

	for further processing or reporting. Wright at ABSTRACT Once an electronic form is loaded in the PDA 104 (FIG. 1), a data collector or interviewer in a survey or questionnaire type of application, can choose to fill out any of a number of forms which have been previously loaded. The number of forms that can be loaded depends on the amount of random-access memory (RAM) (not shown) in the PDA 104. Current PDA devices can generally store large numbers of reasonably small forms in the standard RAM. Users complete or fill out a form during execution of the forms engine function 124. Once form execution begins, the interviewer has very little to do when compared to the paper based process. Because the scripts, running under the forms engine, control form execution, the user doesn't need to follow any complex skip patterns or even worry about answering a question incorrectly. Aside from answering the current question, he/she can select one of four functions by tapping on buttons (FIG. 3): go to the NEXT field 220, go to PREVIOUS field 222, get HELP 224, or QUIT 226. When the NEXT button 220 is pressed, the field script is executed. At this point, the PDA 104 running the script may check to see that the field was answered correctly and if so, go to the next appropriate field. If not, the script may cause the PDA 104 to beep and display a help message, or perform some other action. The forms engine 124 tracks the progress as the user progresses through the form. At any point while completing the form, the user may tap the PREVIOUS button 222 to go back to change an answer to a previous question. Also, the user may tap the HELP button 224 at any time for instructions for the current field. Wright at 13:38-67
(b) tokenizing said questionnaire; thereby producing a plurality of tokens representing said questionnaire;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field

	in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at 2:1-11
(c) storing said plurality of tokens on a computer readable medium on a first computer;	An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database,

	where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at 2:1-11 **FIG. l(a) is a block diagram of one embodiment of an information server 10 that is Internet-based. Information server 10 is an HTTP server, which responds to requests from HTTP clients such as Web browsers.** The actual architecture of an Internet HTTP client-server link and HTTP client is not shown, but it should be understood that information server 10 operates on a computer that is designed and configured for Internet traffic, specifically TCP/IP packets encoding HTTP messages and it should be understood that any manner of client computer can be used to operate the Web browser. Since that technology is well known and readily available, it need not be described further herein. **Information server 10 can either be a dedicated computer**, a computing device specifically designed to implement the functions of an information server according to the methods described herein, or information server 10 can be in the form of one or more program code modules designed to run on a general purpose HTTP server as a process of that HTTP server. However implemented, information server 10 usually comprises the components shown in FIG. 1, such as an HTTP daemon 12 and a basic set of active HTML pages, including an opening page 14, a question page 16 and an additional answers page 18. Warthen at 2:55-3:10

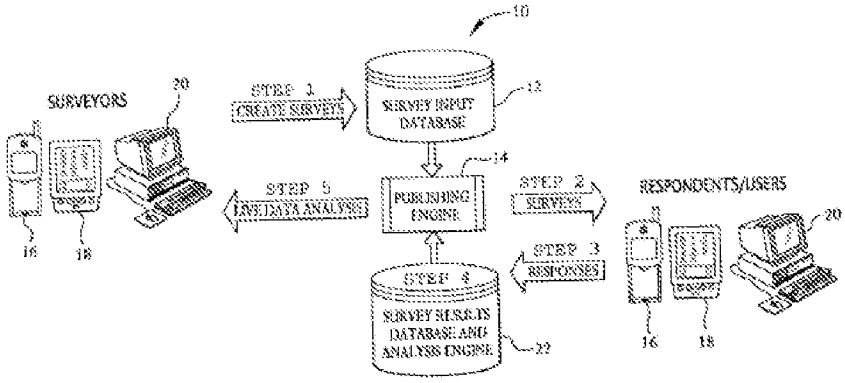
(d) placing a handheld remote computing device into electronic communication with said first computer;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting. alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. **The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA)**. A user of the form. such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Wright at Abstract
(e) transmitting said plurality of tokens to said handheld remote computing device;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting. alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. **The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA)**. A user of the form. such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Wright at Abstract
(f) taking said handheld remote computing device out of electronic communication with said first	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field

computer;	navigation/control (e.g., skip), context sensitive help, data formatting. alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. **The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA)**. A user of the form., such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion. and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at Abstract The present invention is directed to a system and method that allows mobile platforms each supporting any of a variety of call types, and each having differing mobility characteristics, to maintain connectivity to a backbone network in spite of unreliable radio links that occasionally fail. It accomplishes this by using automatic and user-transparent reconnection attempts for appropriate call sessions when an interruption of the link occurs. The network may be supporting a variety of different call types simultaneously. Access to network connectivity resources can be provided according to call session priority based on (for example, call session type, platform mobility, hand-off status, and user class (fee-for-service)) criteria. **The technology allows support of suspended sessions and uses repeated reconnection attempts with priority access to network resources. It also provides for hand-offs of suspended sessions to neighboring gateways as mobile terminals move throughout the service area**. In a network that uses this technology, for example, voice calls (typical of time-sensitive stream traffic) may preempt resources of time-insensitive data calls causing suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at Abstract

	Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-C_h active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(g) after said handheld remote computing device has been taken out of electronic communication with said first computer,	Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-C_h active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active

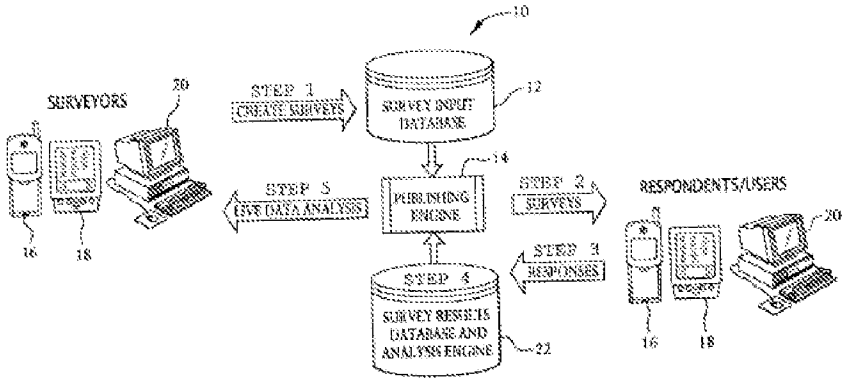
	data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In contrast, mobile users that are engaged in mobile computing (or other forms of data transmission) may have the capability to operate semi-autonomously since data communications with the network are packetized and not necessarily streamed. So with appropriate network design, a temporary disconnection from the network may be transparent to the user. Thus, by implementing the techniques described herein, short term radio link disconnections, which are frequent in mobile communications, need not result in failed sessions, discarded information and wasted use of resources. Rappaport at 5:2-15 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(g1) executing at least a portion of said plurality of tokens representing said questionnaire on said handheld remote computing device to collect a response from a user, and,	Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-C_h active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63

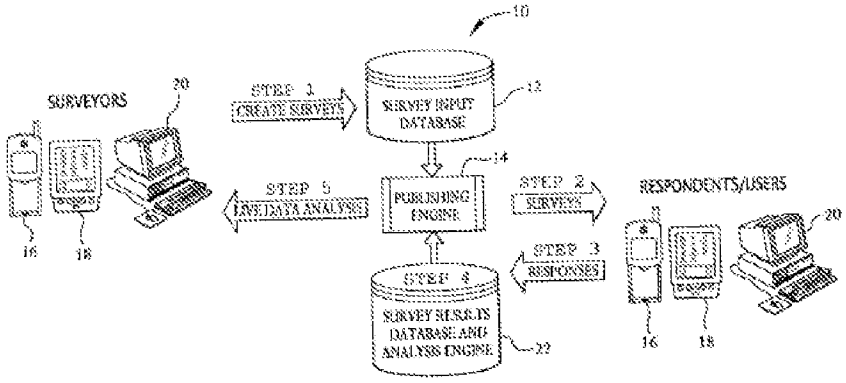
	In contrast, mobile users that are engaged in mobile computing (or other forms of data transmission) may have the capability to operate semi-autonomously since data communications with the network are packetized and not necessarily streamed. So with appropriate network design, a temporary disconnection from the network may be transparent to the user. Thus, by implementing the techniques described herein, short term radio link disconnections, which are frequent in mobile communications, need not result in failed sessions, discarded information and wasted use of resources. Rappaport at 5:2-15 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(g2) storing within said remote computing device said response from the user;	Step 5: Analyzed Data Publishing and Reporting: Once the data has been analyzed in accordance with parameters prescribed by the surveyor, reports and results are published by publishing engine 14. As specified by the surveyor, publishing engine 14 makes the survey results and reports available for access by the surveyor via one or more interface devices (e.g., cell phone 16, PDA 18 or PC 20). The survey results may be "pushed" by the survey publishing system server to the surveyor in the manner known in the art. Alternatively, and preferably, the survey results and reports may passively reside on the survey publishing system server where they may be "pulled" or retrieved by the surveyor. In the latter case, survey publishing system 10 may be programmed to notify the surveyor via electronic mail message or otherwise that the survey results are available for access. It will be understood that publishing engine 14 will publish different levels and depth of data according to the interface device specified by the surveyor to receive the data, e.g., a cell phone will only get high level reports, whereas a PC will receive detailed analysis. Brookler at [0033]

	 FIG. 1
(h) placing said handheld remote computing device into electronic communication with a second computer;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled

	to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at 2:1-11 The present invention is directed to a system and method that allows mobile platforms each supporting any of a variety of call types, and each having differing mobility characteristics, to maintain connectivity to a backbone network in spite of unreliable radio links that occasionally fail. It accomplishes this by using automatic and user-transparent reconnection attempts for appropriate call sessions when an interruption of the link occurs. The network may be supporting a variety of different call types simultaneously. Access to network connectivity resources can be provided according to call session priority based on (for example, call session type, platform mobility, hand-off status, and user class (fee-for-service)) criteria. The technology allows support of suspended sessions and uses repeated reconnection attempts with priority access to network resources. It also provides for hand-offs of suspended sessions to neighboring gateways as mobile terminals move throughout the service area. In a network that uses this technology, for example, voice calls (typical of time-sensitive stream traffic) may preempt resources of time-insensitive data calls causing suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that

	is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at ABSTRACT Based on the above, in general, when a request for a new session (voice, data) is received (in step 10), a connection will be established for the new session (affirmative result in step 11) if there are fewer than C-C_h active sessions in the cell. As described above, time-sensitive sessions may be afforded priority. For instance, preferably, voice sessions are given preemptive priority over data sessions for using channel resources. Since voice sessions must be transmitted or received on a real time basis, reconnection attempts for voice sessions are preferably not allowed. When a voice session arrives and finds all channels C occupied, an active data session (if any are present) is preferably suspended (step 12) (or possibly terminated) to accommodate it. More specifically, when a voice session arrives in a cell in which all channels are occupied and fewer than H sessions are in suspension, and, at least, one active session is of data type, an arriving voice session will obtain a connection (step 13) but an active data session will be suspended (step 12). The choice of which data session to be suspended or be terminated is assumed to be random. Rappaport at 7:44-63 In a network that employs an admission control protocol according to the present invention, voice calls, for example (or other time-sensitive stream traffic) may preempt resources of time-insensitive data calls, which result in suspended sessions that do not result in session failures. Priority access for hand-offs of active sessions with respect to new call sessions can also be accommodated. Mobile users that have some autonomy or who are perhaps exchanging time-insensitive data with a remote site can continue to function essentially undisturbed by link failures since the connectivity and reconnection procedures are managed by the network in a manner that is transparent to the end users. Mobile computing sessions and delay-insensitive data communications, for example, will be able to continue, largely unaware of link failures. Rappaport at 2:44-58
(i) transmitting at least a portion of said response stored within said handheld remote computing device to said second computer; and,	Step 5: Analyzed Data Publishing and Reporting: Once the data has been analyzed in accordance with parameters prescribed by the surveyor, reports and results are published by publishing engine 14. As specified by the surveyor, publishing engine 14 makes the survey results and reports available for access by the surveyor via one or more interface devices (e.g., cell phone 16, PDA 18 or PC 20). The survey results may be "pushed" by the survey publishing system server to the surveyor in the manner known in the art. Alternatively, and preferably, the survey results and reports may passively reside on the survey publishing system server

	where they may be "pulled" or retrieved by the surveyor. In the latter case, survey publishing system 10 may be programmed to notify the surveyor via electronic mail message or otherwise that the survey results are available for access. It will be understood that publishing engine 14 will publish different levels and depth of data according to the interface device specified by the surveyor to receive the data, e.g., a cell phone will only get high level reports, whereas a PC will receive detailed analysis. Brookler at [0033]  FIG. 1
(j) forming a visually perceptible report from any of said at least a portion of said response so transmitted.	Step 5: Analyzed Data Publishing and Reporting: Once the data has been analyzed in accordance with parameters prescribed by the surveyor, reports and results are published by publishing engine 14. As specified by the surveyor, publishing engine 14 makes the survey results and reports available for access by the surveyor via one or more interface devices (e.g., cell phone 16, PDA 18 or PC 20). The survey results may be "pushed" by the survey publishing system server to the surveyor in the manner known in the art. Alternatively, and preferably, the survey results and reports may passively reside on the survey publishing system server where they may be "pulled" or retrieved by the surveyor. In the latter case, survey publishing system 10 may be programmed to notify the surveyor via electronic mail message or otherwise that the survey results are available for access. It will be understood that publishing engine 14 will publish different levels and depth of data according to the interface device specified by the surveyor to receive the data, e.g., a cell phone will only get high level reports, whereas a PC will receive detailed analysis. Brookler at [0033]

	 FIG. 1
CLAIM 12	
12. A method for collecting survey data from a user according to claim 11, wherein step (j) comprises the step of printing a report from any of said response to transmitted.	When server computer 121 receives the information, server computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, converts the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs. Rossmann p. 11, lines 4-8
CLAIM 13	
13. A method for collecting survey data from a user according to claim 11, wherein said first computer and said second computer are a same computer.	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a

	prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
CLAIM 14	
14. A method for	A system and method for providing computerized forms completion and

modifying a questionnaire used in data management according to the method of claim 11, further comprising the steps of: (k) making at least one incremental change to a portion of said questionnaire;	processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific

	embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
(l) tokenizing said at least one incremental change to said questionnaire;	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54

	See also Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
(m) transmitting at least a portion of said tokens resulting from step (k) to said remote handheld computing device, said transmitted tokens comprising less than the entire tokenized questionnaire; and,	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT

	If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT
(n) incorporating said transmitted tokens into said questionnaire at said remote computing device, thereby incrementally	A system and method for providing computerized forms completion and processing. A forms designer utilizes a forms creation module that includes a scripting feature to create an electronic form. The scripting feature provides flow of control statements and a variety of functions useful in forms, e.g., such as questionnaires. These functions include data validation, field navigation/control (e.g., skip), context sensitive help, data formatting, alert sounds and dialog boxes. The scripting feature ensures that skip patterns are followed correctly and that the form is completed

changing said questionnaire.	accurately. The forms creation program generates a field description record for each field created by the forms designer. The set of field description records that define the electronic form is then transferred to a handheld computer, such as a personal digital assistant (PDA). A user of the form, such as a respondent to a survey, utilizes the PDA to respond to the statements or questions that are part of the form. A forms engine executing on the PDA interprets one field at a time and displays that field in the sequence designed by the forms designer. Each field includes a prompt portion, an answer box portion, and a control portion that are displayed together on the display screen of the PDA. After the form is completed, the response data is optionally transferred to another computer for further processing or reporting. Wright at ABSTRACT If the Next button 220 (FIG. 3) was not selected, as determined at state 350, the forms engine 124 advances to a decision state 370 to determine if the user has made changes to the answer box 164 portion of the display (FIG. 3) response(s). If so, the forms engine 124 moves to a "process answer box input" function 372. Function 372 initiates drawing the selections or input made by the user in the answer box portion 164 of the screen display 162 (FIG. 3) while completing the current field and performs validation, e.g., makes sure input falls within the constraints of the field. The form data array and, if necessary, the field status record are also updated during the answer box input function 372. Function 372 will be further described in conjunction with FIG. 10. Wright at 16:41-54 *See also* Wright at Figures 1-11 An information server directs users of the information server to desired sources of information where the desired sources of information are determined, at least in part, based on user input. The information server includes a query input processor, a question processor and an answer processor. The query input processor is used for accepting an initial user query. The question processor processes the initial user query to identify a set of possible well-formed questions selected from the question database, where a well-formed question is a question in the database that is coupled to at least one answer reference. The answer reference is typically either an answer or a pointer to a possible location of an answer. In a specific embodiment, the information server is coupled to the Internet so that users can pose questions using a Web browser from any Internet-connected device. In some systems, the question processor includes a tokenizer for tokenizing the initial user query into a list of words, a parser for generating a syntactic structure from the list of words, a normalizer for reducing the syntactic structure to a canonical syntactic structure, and a matcher for matching the canonical syntactic structure against a semantic network to

	obtain a weighted list of well-formed questions representative of possible semantic meanings for the initial user query. Warthen at ABSTRACT

VI. CONCLUSION

The prior art documents presented in the above Request were either not previously considered by the Office or are now being presented in a new light pursuant to MPEP § 2242(II). Claims 1-14 of the '816 patent are not patentable over the prior art documents cited herein. The prior art documents teach the subject matter of the '816 patent in a manner such that substantial new questions of patentability for all claims are raised by this Request.

In view of the foregoing, it is respectfully submitted that substantial new questions of patentability of claims 1-14 of the '816 patent have been raised by this Request. Accordingly, the Office is requested to grant this Request and to initiate reexamination with special dispatch.

Enclosed is a credit card authorization to cover the Fee for reexamination. If this authorization is missing or defective please charge the Fee to the Novak Druce Deposit Account No. 14-1437.

Respectfully submitted,

/Jay J. Guiliano/
Novak Druce & Quigg, LLP
Jay J Guiliano
Reg. No.
Ryan M. Murphy
Reg. No. 66,285

NOVAK DRUCE + QUIGG LLP
1000 Louisiana St.
53rd Floor
Houston, Texas 77002
P: 713-571-3400
F: 713-456-2836