EXHIBIT 2003

File history for U.S. Application No. 16/279,387 with a filing date of 2/19/2019
and now U.S. Patent. 10,380,611

To: patdocketing@slk-law.com,ktirilli@slk-law.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 57838

Jul 25, 2019 03:44:07 AM

Dear PAIR Customer:

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 57838 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
16279387	ISSUE.NTF	07/24/2019	A12875-088356

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice.

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/279,387	08/13/2019	10380611	A12875-088356	6934

57858 7590 07/24/2019

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Steven A. Roberts, Tampa, FL;
Afterwords, Inc., Tampa, FL;
Drew Peloubet, Tampa, FL;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 06/05/2019

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/279,387	02/19/2019	Steven A. Roberts	A12875-088356	6934

TITLE OF INVENTION: TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEES DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/05/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
SINGH, HERKAWALJIT	3683	705-007330

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or later) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The name of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm having as a member a registered attorney or agent and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Shumaker, Loop & Kendrick, LLP
2 Jeffrey B. Fabian
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: **AFTERWORDS, INC.**

(B) RESIDENCE: (CITY and STATE OR COUNTRY): **TAMPA, FLORIDA**

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. **57838**

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: /Jeffrey B. Fabian/ Date: July 1, 2019

Typed or printed name: Jeffrey B. Fabian Registration No.: 70,164

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	16279387
Filing Date:	19-Feb-2019
Title of Invention:	TRANSACTION SPECIFIC CUSTOMER SURVEY SYSTEM
First Named Inventor/Applicant Name:	Steven A. Roberts
Filer:	Jeffrey Bruce Fabian/Cherise Christianson
Attorney Docket Number:	A12875-088356

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**500**

Electronic Acknowledgement Receipt

EFS ID:	36458401
Application Number:	16279387
International Application Number:	
Confirmation Number:	6934
Title of Invention:	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM
First Named Inventor/Applicant Name:	Steven A. Roberts
Customer Number:	57838
Filer:	Jeffrey Bruce Fabian/Charise Christianson
Filer Authorized By:	Jeffrey Bruce Fabian
Attorney Docket Number:	A12875-088856
Receipt Date:	01-JUL-2019
Filing Date:	19-FEB-2019
Time Stamp:	10:59:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	5500
RAM confirmation Number	070119INTEFSW00011829505605
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_Transmittal_16279387.pdf	106164	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30319	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	136483		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

To: patdocketing@slk-law.com,ktirilli@slk-law.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 57838

Jun 14, 2019 03:43:43 AM

Dear PAIR Customer:

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 57838 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
16279387	NTC.PUB	06/13/2019	A12875-088356

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice.

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
[illegible]

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/279,387	02/19/2019	Steven A. Roberts	A12875-088356

CONFIRMATION NO. 6934

57838
SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

PUBLICATION NOTICE



Title:TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

Publication No.US-2019-0180296 A1
Publication Date:06/13/2019

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 04/05/2019
SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

EXAMINER
SINGH GURKANWALJIT

ART UNIT	PAPER NUMBER
3683	

DATE MAILED: 04/05/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/279,387	02/19/2019	Steven A. Roberts	A12875-1868356	6934

TITLE OF INVENTION: TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/05/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 06/05/2019

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/279,387	02/19/2019	Steven A. Roberts	A12875-088356	6934

TITLE OF INVENTION: TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEES DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/05/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
SINGH, HERKAWALJIT	3683	705-007330

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47, Rev 03-09 or later version) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1
(2) The name of a single firm having as a member a registered attorney or agent and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed 2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: (*Please first reapply any previously paid fee shown above*)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No.:

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature Date

Typed or printed name Registration No.

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/279,887	02/19/2019	Steven A. Roberts	A12875-088456	6934

7590 04/05/2019

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

EXAMINER

SINGH GURKANWALJIT

ART UNIT	PAPER NUMBER
3683	

DATE MAILED: 04/05/2019

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(b)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/279,387	Applicant(s) Roberts et al	
	Examiner GURKANWALJIT SINGH	Art Unit 3683	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to Applicants claims filed 02/19/2019.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-19. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov**.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/GURKANWALJIT SINGH/
Primary Examiner, Art Unit 3683

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

DETAILED ACTION

1. The following Office action is in response to communication filed on February 19, 2019. **Claims 1-19** are currently pending and have been allowed.

Allowable Subject Matter

2. Claims 1-19 are allowed.

Reasons for allowance

3. As per the independent claims the following is an examiner's statement of reasons for allowance: The prior art of record most closely resembling Applicant's claimed invention are Proud et al., (US 2010/0070376), Riordan et al., (US 6,078,891), and Tillman (US 2003/0216981).

Proud discloses and automated system for facilitating sales in dynamically-changing mobile retail environments includes a vendor/supplier connector module, a carrier connector module, a provisioning module, and a point-of-sale (POS) customization module. The vendor/supplier connector module facilitates automated exchange of product data with a plurality of different vendors or suppliers of products or services. The carrier connector module facilitates automated exchange of

transportation data with a plurality of different carriers, with the transportation data corresponding to specific mobile retail environments. The provisioning module automatically determines, based on the product data and on the transportation data, products or services corresponding to a specific mobile retail environment. The POS customization module automatically generates re-configuration data for each of a plurality of POS interfaces. The re-configuration data limits each of the plurality of POS interfaces to facilitating sales of only the subset of the set of products or services that corresponds to a specific mobile retail environment.

Riordan provides a system and method for the collection of marketing data simultaneously captures at a point-of-sale all financial and non-financial data pertaining to a specific consumer transaction. An electronic invoice is constructed from the captured data and transmitted to a credit authorization location via a communication link necessarily established to transmit a credit authorization request for the transaction. The electronic invoice contains line item data for each item purchased as part of the transaction. The invoice is organized around the identification number of the payment vehicle employed by the customer to pay for the transaction, thus linking the purchasing information contained in the invoice to a particular consumer. The credit authorization location receives the transmitted electronic invoice and forwards the invoice to a data warehouse, which may be located in a location remote from the credit authorization location. The data warehouse comprises a plurality of related data structures for storing the received data. The related data structures facilitate simple and flexible analysis and searching of the collected market data.

Tillman discloses one or more networked computers (18) receives input from a customer (12) specifying two or more vendors having vendor web sites (14) from which to purchase goods or services during an online shopping session, receives input from the two or more vendors indicating that the customer has purchased goods or services at the two or more

vendor web sites during the online shopping session, and outputs a single online receipt (32) to the customer reflecting all goods or services purchased at the two or more vendor web sites during the online shopping session. Sales tax may be collected from the customer for goods or services purchased during the online shopping session and electronically disbursed tax to one or more tax authorities. Payment for the goods or services purchased during the online shopping session may be electronically collected and disbursed to vendors. Credits for one or more purchased goods or services may also be disbursed. Reports may be generated based on a plurality of data collected during POS transactions.

However, the combination of Proud, Riordan, and Tillman fails to teach or suggest the limitations, in their collective combinatory entirety, of this application's independent claims 1 and 14.

As per the dependent claims, these claims depend on the allowed independent claims and incorporate the limitations thereof, and are therefore allowed for at least the same rationale as applied to the independent claims, and incorporated herein.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GURKANWALJIT SINGH whose telephone number is (571)270-5392. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Stamber can be reached on 571-272-6724. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GURKANWALJIT SINGH/
Primary Examiner, Art Unit 3683

Notice of References Cited	Application/Control No. 16/279,387	Applicant(s)/Patent Under Reexamination Roberts et al.	
	Examiner GURKANWALJIT SINGH	Art Unit 3683	Page 1 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20100070376-A1	03-2010	Proud; Brett	G06Q20/20	705/21
*	B	US-8328094-B2	12-2012	Proud; Brett	G06Q20/20	235/383
*	C	US-2011/0196754-A1	08-2011	Proud; Brett	G06Q20/20	705/16
*	D	US-20030018550-A1	01-2003	Rotman, Frank Lewis	G06Q30/02	705/35
*	E	US-20070100728-A1	05-2007	Rotman, Frank Lewis	G06Q30/02	705/36R
*	F	US-20100076813-A1	03-2010	Ghosh; Debashis	G06Q30/02	705/7.34
*	G	US-8417561-B2	04-2013	Ghosh; Debashis	G06Q30/0205	705/7.34
*	H	US-20090006151-A1	01-2009	Zarghami; Jay	G06Q10/06375	705/7.31
*	I	US-20070050229-A1	03-2007	Tatro, Edward	G06Q10/087	705/15
*	J	US-7937286-B2	05-2011	Newman; Alan B	G06Q30/02	705/7.31
*	K	US-8027891-B2	09-2011	Preston; Patricia	G06Q40/00	705/30
*	L	US-8255260-B2	08-2012	Rane; Rajendra R.	G06Q30/0202	705/7.33
*	M	US-2006/0151598-A1	07-2006	Chen; Yen-Fu	G06Q20/20	235/380

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Ron Borzekowski, Elizabeth K. Kiser. The choice at the checkout: Quantifying demand across payment instruments, International Journal of Industrial Organization, Volume 26, Issue 4, July 2008, Pages 889-902, ISSN 0167-7187
	V	Shankar, Venkatesh, and Sridhar Balasubramanian. "Mobile marketing: a synthesis and prognosis." Journal of Interactive Marketing 23.2 (2009): 118-129.
	W	Lang, M. C. (2010). Entrepreneurial idea identification through online social networks. (Order No. 3440018, Morgan State University). ProQuest Dissertations and Theses, 145.
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 16/279,387	Applicant(s)/Patent Under Reexamination Roberts et al.	
	Examiner GURKANWALJIT SINGH	Art Unit 3683	Page 2 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-7792697-B2	09-2010	Bhagchandani, Puneet S	G06Q30/02	705/14.49
*	B	US-7328169-B2	02-2008	Temares, Mark E	G06Q30/02	705/14.25
*	C	US-20020026348-A1	02-2002	Fowler, Malcolm R.	G06Q30/02	705/14.11
*	D	US-20070055597-A1	03-2007	Patel, Kanleek	G06Q30/0206	705/35
*	E	US-6839682-B1	01-2005	Blumer, Matthias	G06Q30/02	705/14.4
*	F	US-6078891-A	06-2000	Riordan, John	G06Q20/29	705/16
*	G	US-5032450-A	11-1999	Jones; Charles R.	G06Q20/202	705/14.25
*	H	US-20030216981-A1	11-2003	Tillman, Michael	G06Q20/04	705/34
*	I	US-20100010905-A1	01-2010	Arzumanyan; Andre	G06Q20/0453	705/2
*	J	US-20110087519-A1	04-2011	Fordyce, III; Edward W.	G06Q30/02	705/7.29
*	K	US-20100250681-A1	11-2010	Faith, Patrick	G06Q10/06375	705/7.34
*	L	US-9208481-B2	12-2015	Arzumanyan; Andre	G06Q20/0453	1/1
*	M	US-20120109709-A1	05-2012	Fordyce, III; Edward W.	G06Q30/02	705/7.29

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 16/279,387	Applicant(s)/Patent Under Reexamination Roberts et al.	
	Examiner GURKANWALJIT SINGH	Art Unit 3683	Page 3 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20140372184-A1	12-2014	Blumenthal, Mark	G05Q30/0217	705/7.41
*	B	US-20160247111-A1	08-2016	Blumenthal, Marc	G06Q10/06395	1/1
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classification may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/279,387	Roberts et al.
	Examiner	Art Unit
	GURKANWALJIT SINGH	3683

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original									
	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/279,387	Roberts et al.
	Examiner	Art Unit
	GURKANWALJIT SINGH	3683

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
EAST search	03/28/2019	GS
NPL search (sub, similar search strategy as East): ProQuest, IEEE, Google, ACM	03/28/2019	GS
Google Patents	03/27/2019	GS

/GURKANWALJIT SINGH/ Primary Examiner, Art Unit 3683	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/279,387	Roberts et al.
	Examiner	Art Unit
	GURKANWALJIT SINGH	3683

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
705	all	03/28/2019	GS
708	all	03/28/2019	GS
235	all	03/28/2019	GS
G06Q	30/all, 10/all, 20/all	03/28/2019	GS
G07G	1/all	03/28/2019	GS
Y04S	10/all	03/28/2019	GS
Y10S	707/all	03/28/2019	GS

/GURKANWALJIT SINGH/ Primary Examiner, Art Unit 3683	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/279,387	Roberts et al.
	Examiner	Art Unit
	GURKANWALJIT SINGH	3683

CPC							
Symbol						Type	Version
G06Q	/	30	/	0201		F	2013-01-01
G06Q	/	30	/	0202		I	2013-01-01
G06Q	/	10	/	06395		I	2013-01-01
G06Q	/	30	/	0205		I	2013-01-01
G06Q	/	20	/	20		I	2013-01-01
G07G	/	1	/	0009		A	2013-01-01
Y10S	/	707	/	99933		A	2013-01-01
H04B	/	5	/	0025		A	2013-01-01
G07G	/	1	/	14		A	2013-01-01
Y04S	/	10	/	54		A	2013-01-01

CPC Combination Sets								
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	19	
/GURKANWALJIT SINGH/ Primary Examiner, Art Unit 3683	28 March 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/279,387	Roberts et al.
	Examiner	Art Unit
	GURKANWALJIT SINGH	3683

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G06Q		30		00

NON-CLAIMED				

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
705	7.29

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
705	21	35	7.34	7.31	7.33	7.41
706	15	32				
235	380	379				

NONE (Assistant Examiner) (Date)	Total Claims Allowed: 19	
/GURKANWALJIT SINGH/ Primary Examiner, Art Unit 3683 (Primary Examiner) (Date) 28 March 2019	O.G. Print Claim(s) 1	O.G. Print Figure 2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/279,387	Roberts et al.
	Examiner	Art Unit
	GURKANWALJIT SINGH	3653

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10		19										
	2		11												
	3		12												
	4		13												
	5		14												
	6		15												
	7		16												
	8		17												
	9		18												

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	19	
/GURKANWALJIT SINGH/ Primary Examiner, Art Unit 3653	28 March 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office Part of Paper No. 20190328

Available online at www.sciencedirect.com
ScienceDirect
Journal of Interactive Marketing 23 (2009) 118–129
JOURNAL OF INTERACTIVE MARKETING
www.elsevier.com/locate/intmar

Mobile Marketing: A Synthesis and Prognosis

Venkatesh Shankar [a,*] & Sridhar Balasubramanian [b]

[a] Professor of Marketing and Coleman Chair in Marketing, Mays Business School, Texas A&M University, College Station, TX 77843, USA
[b] Ray & Alice H. Richards Bicentennial Scholar and Associate Professor of Marketing, University of North Carolina at Chapel Hill, NC 27599, USA

Abstract

Mobile marketing refers to the two- or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device, or technology. We present the conceptual underpinnings of mobile marketing and a synthesis of the relevant literature. We identify and discuss four key issues: drivers of mobile device/service adoption, the influence of mobile marketing on customer decision-making, formulation of a mobile marketing strategy, and mobile marketing in the global context. We outline research directions related to these issues and conclude by delineating the managerial implications of mobile marketing insights.
© 2009 Direct Marketing Educational Foundation, Inc. Published by Elsevier B.V. All rights reserved.

Keywords: Mobile media; Wireless; Technology; Marketing communication; Marketing strategy; Promotions

Introduction

The demand for mobile devices – equipment such as cell phones, PDAs, and digital music players that are typically used on an anytime, anywhere basis without being connected by wires – and services that use these mobile devices (mobile services) is growing rapidly worldwide. The global market for mobile entertainment goods and services is expected to grow from $17.3 billion in 2006 to $76.9 billion in 2011 (Gibson 2006). Total non-messaging mobile content revenues are expected to increase from $70.7 billion in 2007 to $187.9 billion in 2012 (Higgins 2007). Furthermore, mobile services such as global positioning system (GPS) navigation, mobile email, and text and video messaging are growing at a significant pace.

Amid such a surge in markets for mobile devices and applications, mobile marketing – the set of marketing initiatives that use mobile devices and media (the vehicles of communication that involve mobile devices) – is gaining importance. For example, spending on mobile advertising in the U.S., now at about $644 million, is anticipated to rise to over $3.5 billion by 2011 (eMarketer 2007a). Similarly, spending on mobile message marketing in the U.S., now pegged at $4.2 billion, is expected to grow to $12 billion in 2011 (eMarketer 2007b). Not surprisingly, mobile marketing is an emerging topic of interest to both academics and practitioners.

Formally, we define mobile marketing as the two-way or multi-way communication and promotion of an offer between a firm and its customers[1] using a mobile medium, device, or technology. Because it involves two-way or multi-way communication, mobile marketing is primarily interactive in nature, and could include mobile advertising, promotion, customer support, and other relationship-building activities. Such interactive marketing activities are becoming increasingly important in the changing business landscape (Ancarani and Shankar 2003; Hulton and Stevens [ver 2009]; Deighton and Kornfeld 2009).

Research on mobile commerce has primarily addressed the role of technology in facilitating the growth of transactions through mobile devices. However, research on mobile marketing is nascent. Existing research has yielded some insights, but these remain scattered across disciplines.

In this paper, we provide an integrative framework for the analysis of mobile marketing, identify key issues of interest within this domain, delineate gaps in our knowledge of mobile marketing that require managerial and research attention, and outline managerial implications of insights related to mobile marketing.

* Corresponding author.
E-mail addresses: vshankar@mays.tamu.edu (V. Shankar),
sridhar_balasubramanian@kenan-flagler.unc.edu (S. Balasubramanian).

[1] For expositional ease, we use the terms consumer and customer interchangeably throughout the paper.

1094-9968/$ – see front matter © 2009 Direct Marketing Educational Foundation, Inc. Published by Elsevier B.V. All rights reserved.
doi:10.1016/j.intmar.2008.10.001

Synthesis of key issues: existing knowledge and knowledge gaps

To better understand mobile marketing, it is useful to briefly review the key characteristics of mobile media and devices, and to compare mobile and mass marketing. The mobile channel – the marketing channel involving mobile devices – is growing rapidly in the multichannel environment (Sinha and Mandel 2008). All mobile devices incorporate one or more of the following capabilities: audio, text/data, and video. Furthermore, the following properties of mobile devices have key marketing implications.

Location-specificity

Many mobile devices, including car navigation systems, have GPS capabilities to identify their physical location. This property provides marketers the opportunity to target location-sensitive promotional offers to mobile device users. Conventional marketing media such as billboards also allow location-specific messages, but with mobile devices, such information can be actually targeted at the location of the individual user based on their stated preferences and revealed behaviors. Such targeting raises some privacy concerns and must be carefully managed. Nevertheless, customers have rapidly adopted location-based mobile services, with the number of worldwide users of such services expected to increase from 61 million today to 329 million in 2011 (eMarketer 2008).

Portability

An important benefit of a mobile device to consumers is its ultra small size and the ease with which it can be carried (Balasubramanian et al. 2002). A mobile device is not only portable, but because it fits in a hand, it is a constant companion to the user and is used on a continuous basis. This property makes it easier for marketers to quickly communicate with the user at any point in time, but the small screen size does not allow information-intensive messages to be delivered.

Untethered/wireless feature

Unlike other frequently used devices such as the desktop PC, the typical mobile device is not tethered or connected by wires for the majority of the time that it is in use. This property promotes increased usage, creating more opportunities for marketers to convey marketing messages. At the same time, the short duration of the typical usage occasion forces marketers to be concise in their messages.

Based on these properties, the key differences between mass marketing (typically conducted through mass media such as magazines and television) and mobile marketing are detailed in Table 1. Mass marketing addresses a broad range of existing and potential customers. Mobile marketing, in contrast, is restricted to owners of mobile devices, and in many cases, to a subset of those owners who opt-in to receive communications from marketers. Bandwidth capacity and tight screen size constraints related to mobile devices further restrict the types of communications possible in a mobile marketing context. However, the brevity of communication through a mobile device can also enable more frequent interactions between the marketer and the customer. Furthermore, with mobile marketing, the seller can more precisely target customers at a specific location and at a particular time, better measure and track consumer response, and have lower unit costs of communication with the target audience than those associated with mass marketing.

Table 1
Differences between mass marketing and mobile marketing.

Dimension	Mass marketing	Mobile marketing
Scope of audience	All existing and potential users of the product	Existing and potential product users owning mobile devices who opt-in to receive communication
Potential type of communication	Text, voice, and video in rich formats	Text, voice, and video in very limited visual space with limitations in transmission speed
Typical direction of communication	Marketer-to-consumer	Interactive between marketer and consumer
Ability to deliver message by target location	Low	High
Ability to measure and track response	Low	High
Consumer targetability	Low	Medium
Cost per target audience	High	Low

We now outline a set of key issues and discuss the relevant managerial and research questions. For each issue, we review existing knowledge and delineate the areas that need research attention. Table 2 presents a summary of these issues. In this summary, we outline the key issue and the critical questions, current knowledge, and the unexplored research questions related to the issue.

Customer adoption of mobile devices and services

Consistent with the drivers of the adoption of any innovation, the key drivers of a consumer's decision to adopt a mobile device or service include the relative advantage of the innovation, the innovation's fit with existing usage patterns, the perceived complexity of the innovation, the ability to try out the innovation, the perceived risk related to adoption, and the degree to which adoption and use of the innovation is observable by others (Rogers 1995). In addition, the Technology Adoption Model (TAM, Davis 1989), which is derived from the Theory of Reasoned Action/TRA (Fishbein and Ajzen 1975), posits that perceived usefulness and perceived ease of use influence attitudes toward an innovation, and ultimately, its adoption. Unlike the TRA, the TAM allows perceived usefulness and ease of use to directly drive adoption, reflecting the notion that a positive attitude may not be required for adoption to occur. For example, norms and pressures from a social group can induce customers within that group to adopt an innovation, according to the TAM2 model (Venkatesh and

Table 2
Summary of key issues in mobile marketing.

Key issue	Critical questions	What we know — current evidence	Some unexplored questions
Customer adoption of mobile devices and services	-What drivers are common to the adoption of all innovations?	-General innovation adoption drivers, perceived ease of use, perceived usefulness, content relevance, personalization, and a host of social and economic influences determine adoption of mobile devices/services.	-What are the key factors that inhibit greater use of mobile devices and services for information search and purchase of products and services?
	-What drivers are unique to the adoption of mobile innovations?	-Relevance of content, ease of use, and personalization more important for wireless websites than for Internet websites	-Are these inhibitors related to a lack of knowledge about these services, a lack of confidence in the customer's ability to use these services, inability to project the cost of using these services, or technological limitations related to mobile browsing and/or communication bandwidth?
			-What is the role of trust in the adoption of mobile devices and services?
The impact of mobile marketing on customer preferences and decision-making	-What stages of decision-making does mobile marketing have the greatest impact?	-Mobile marketing directly impacts all the five stages of customer decision-making	-Can a marketer use their differences as a basis for customer segmentation in the mobile marketing context?
	-What are the relative sizes of the direct and indirect effects of mobile marketing?	-It moderates the effects of influencers such as economic, social, and competitive forces	-To what extent must such segmentation be guided more by attitudes toward mobile marketing at the various stages of the decision-making process than by revealed behaviors at these stages? -Should the marketer pursue different segmentation schemes at different stages of decision-making? -Can mobile marketing be used to improve customer loyalty? -Will the opportunity to create content and consume content developed by other users enhance customer loyalty in the mobile context?
Formulation of a mobile marketing strategy and choice of mobile marketing methods	-What framework exists for mobile marketing strategy formulation?	-Firms can use a framework based on two dimensions, the degree of change to business model and the degree of organizational transformation needed and choose one of three strategies, operational performance, reach and range, and new business models.	-How does the firm's mobile strategy mesh with the firm's overall marketing strategy? How should the mobile strategy complement or substitute elements of overall marketing strategy?
	-What are the key determinants of mobile marketing strategy?	-The choice of mobile marketing methods depends on the pros and cons of the methods, synergies among the methods and methods used by competitors	-How should advertising campaigns be redesigned to include a mobile element, and how should that element link to initiatives in mass media or on the Internet?
	-What mobile marketing methods should be used? -Does mobile marketing create economies of scale? -Does mobile marketing create economies of scope? -Does mobile marketing create synergy with other marketing forms?	-Firms can effectively use mobile advertising and mobile promotion synergistically with other marketing forms	-How should a firm's mobile marketing strategy evolve across (a) the product life cycle, and (b) the customer life cycle?
Mobile marketing in the global context	-How does adoption of mobile devices and media differ across countries?	-Digital divide reversed in BRIC countries	-To what extent are the differences in mobile marketing adoption and usage across countries driven by economic divides, and by variations in culturally ingrained videos and norms?
	-How does mobile marketing differ across countries?	-Response rates to mobile offers differ across countries. Among Western European countries, Spain has the highest response rate (20%), while Germany has the lowest response rate (2%).	-To what extent are these differences driven by the stage of mobile technology adoption?
	-How will mobile marketing evolve relative to marketing through the personal computer in different countries?	-Behavioral intent toward mobile promotions differs across the U.S. and developing countries	-Which differences are likely to endure even after adoption levels have peaked? What are the differences in how marketing managers across countries perceive the promise and perils of mobile devices and services? -How can Internet-based marketing initiatives that are now predominantly implemented and accessed through the personal computer be replaced by mobile marketing initiatives?

Davis 2000). These additional drivers apply to mobile devices and services as well.

The Theory of Planned Behavior/TPB (Ajzen 1985) builds on the TRA, but is more sensitive to the fact that motivation to adopt an innovation may not always translate into action due to (a) social, environmental, and personal behavioral controls, and (b) other resource-related constraints that ultimately hinder adoption behavior. The decomposed TPB takes this perspective one step further, and decomposes the beliefs that drive adoption behavior into attitudinal beliefs (e.g., beliefs that relate to perceived usefulness and ease of use), subjective norm-related beliefs (e.g., beliefs that the potential adopter's peers expect him or her to adopt the innovation), and behavioral control beliefs (e.g., beliefs that personal and organizational resources and capabilities will or will not support adoption of the innovation, and the cost of adopting the innovation). Interestingly, the decomposed TPB comes close to the Motivation–Opportunity–Ability perspective that has been applied to explain a range of individual- and firm-level behaviors (e.g., Sirmans et al. 2008). Overall, as summarized in the SEP model of innovation adoption and usage, a range of inter-related influences of social (S), economic (E), and psychological (P) origins can influence the adoption of an innovation such as a mobile device or service (Kumar and Balasubramanian 2005).

Two aspects of a mobile innovation's adoption are relevant from a marketing manager's viewpoint: perceived usefulness and usability. The usefulness and enjoyment derived in using an innovation will likely lead to increased loyalty and future use (e.g., Henderson et al. 1998). Furthermore, the design of the user interface of the innovation, in particular, the visual design elements, can increase consumer trust in the service provider (Kim and Moon 2009). Some research on the usability of technology-intensive devices such as personal computers and websites (Balasubramanian, Konana, and Menon 2003) may extend to mobile devices and services as well.

However, not all findings regarding the evaluation of websites and personal computers may directly apply to mobile devices. Venkatesh et al. (2003) studied how technology users differentially weighted the importance of the five categories in the Microsoft Usability Guidelines (MUG) – namely, content (including informational and transactional capabilities), ease of use, personalization (the customization of the site to reflect the user's needs), promotion (advertising of the site), and emotion (affective reactions invoked by the site) – across devices. They found that whereas content was equally important across Internet and wireless websites at the aggregate level, that content was more relevant for wireless websites than for Internet websites. Furthermore, ease of use and personalization were relatively more important, while promotion and emotion were less important in the wireless context than in the Internet context. Some of these differences are ostensibly driven by the more constrained nature of the mobile medium, including device and display limitations and interface challenges.

With the steady expansion in information transmission bandwidths and the rapid introduction of more sophisticated mobile applications, mobile device usability is now as important as mobile website usability. However, early challenges to usability in the m-commerce environment were primarily related to services than devices. Interestingly, based on a study of the adoption of Wireless Application Protocol (WAP) services, a key criticism advanced is that the usability of wireless-oriented sites was significantly reduced because of the misguided application of the design principles from the area of traditional Web design (Ramsay and Nielsen 2000). In particular, insufficient attention to the "mobility" aspect of m-commerce in user tasks and information exchange processes may hinder user adoption (Chan and Fang 2001). To incorporate the role of mobility and the user environment, Kim et al. (2002) analyzed the role of three contextual factors — hand (how many hands are being used on the device), leg (whether the device is being used in a state of motion or not) and co-location (whether the device is being used in a space where other individuals are present or not).[2] Their findings together suggest that, whereas some general principles of user-centered design may well be applicable in the mobile context, the design and usability of wireless sites and devices also require some specialized research attention.

An integration of scattered theoretical perspectives can provide a better understanding of decisions to adopt a technological innovation such as a mobile device or service (Kumar and Balasubramanian 2005). Consistent with this notion, Nysveen et al. (2005) combine information system theories from organizational contexts with theories that explain technology usage in everyday life to innovation adoption. The latter include uses and gratification theory (e.g., Leung and Wei 2000), which focuses on non-utilitarian benefits from adoption such as expressiveness and enjoyment, and domestication theory (e.g., Silverstone and Hirsch 1992; Skog 2002), which focuses on how customers "tame" technologies to fit them into their lives. Nysveen et al. demonstrate that the intention to use mobile devices can be driven by perceived expressiveness of the mobile device (i.e., its ability to express fashion and style, and to serve as a symbol), perceptions of enjoyment, usefulness and ease of use, normative pressure, and behavioral controls. However, some of these effects are mediated by the attitude toward the use of mobile services. Interestingly, the strengths of these influences varied across four mobile service areas: person-to-person interactive text messaging, contact services (which extend text messaging to a larger social network), payment services, and gaming services. These services differ in terms of whether they are machine-interactive versus person-interactive, and whether they involve goal-directed versus experiential processes. Specifically, Nysveen et al. found that ease of use was a stronger motivation for using goal-directed mobile services whereas enjoyment and expressiveness were stronger motivators for experiential services. Normative pressures and the attitudes toward use were stronger motivators of adoption for person-interactive services compared to machine-interactive

[2] Interestingly, users encountered fewer problems accessing and using mobile websites when others were present around them. However, as noted by Kim et al. (2002), this may be an artifact which simply reflects the reality that mobile applications would potentially be more difficult to access in remote places.

services, ostensibly reflecting the more pronounced role of social interactions in the former.

Negni (2004) empirically examined the determinants of adoption of third generation mobile multimedia service in the Italian market. She found that perceived usefulness, ease of use, price, and speed of use, in that order, were the most important determinants of adoption of multimedia mobile services. She also showed that the importance of determinants differed across segments based on age.

Kleijnen, de Ruyter, and Wetzels (2004) studied the drivers of mobile gaming adoption using a survey of mobile game users in the Netherlands. They found that perceived risk, followed by complexity and compatibility were the most important drivers of adoption. Their analysis, however, revealed that the key drivers differed by consumer segments. For value seekers, compatibility was the critical driver; for risk avoiders, perceived risk was the key determinant, and for game players, navigation, communicability and payment options were the driving factors.

Despite these advances, existing research on adoption behavior in the specific context of mobile devices and services is sparse. Whereas mobile device and service penetration rates are high, the use of mobile services beyond interactive conversations is comparatively low. There are significant adoption-related hurdles for mobile marketing. One such barrier is the penetration of video capability. In the U.S., cell phone has a penetration of 86% with a user base of 260 million. Of these, about 60% use short-message-service (SMS). However, the number of video-capable mobile devices is only 12 million (Strahan 2007). The penetration of such devices is not expected to go up anytime soon. By 2011, only 25 million devices are expected to have video capability (Strahan 2007). Importantly, about 79% of U.S. consumers do not view a mobile advertisement (Nielsen Mobile 2008). Furthermore, about 82% of mobile device users in the U.S. do not trust SMS (Nielsen Mobile 2008). Trust is a key issue in online marketing (Bart et al. 2005; Grabner-Kräuter and Kaluscha 2003) and could be important in mobile marketing as well.

Based on the preceding review of adoption of mobile devices and services, the following questions are worthy of exploration. What are the key factors that inhibit greater use of mobile devices and services for information search and purchase of products and services? Are these inhibitors related to a lack of knowledge about these services, a lack of confidence in the customer's ability to use these services, an inability to project the cost of using these services, or technological limitations related to mobile browsing and/or communication bandwidth? What is the role of trust in the adoption of mobile devices and services? Answers to these questions will enhance our knowledge of adoption of mobile devices and services.

The impact of mobile marketing on customer preferences and decision-making

How does mobile marketing influence customer preference and decision-making? There is scant academic research on this issue. However, industry reports offer an early glimpse into customer perceptions and behavior in this context. Specifically, a survey by EMA (2008) of 800 U.S. teenage and young adult users of mobile phone services revealed that responders to mobile marketing offers were more likely to be males, teens and young adults, individuals with higher incomes, and individuals with heavier usage of mobile phones and data features. Thus, mobile marketing appears to work better for some customer demographics than for others.

The study further showed that the use of mobile marketing was highest in the entertainment, music and video product category (44%), followed by food/beverage (21%), and beauty/personal care (15%). According to the study, the automotive/transportation, business services, consumer electronics, financial services, and vacation/travel categories each accounted for 12% of the mobile offers. In terms of response, however, the study found that buyers of entertainment, music and video products were more responsive than consumers of other product categories, suggesting that mobile marketing works best for entertainment products and services.

The study also showed that text messages for products or services elicited the highest response rates (70%), followed by mobile survey participation (41%). According to the study, mobile email, Web, and coupons were less effective in eliciting response. These results suggest that brief messages elicit better response than do complex messages, consistent with the portability and untethered properties of a mobile device.

The study also revealed consumer attitudes toward mobile marketing: less than 10% of the respondents expressed an interest in receiving offers or viewing ads in videos; and more than two-thirds of the respondents preferred a "do not email/message" or a "do not call" registry for mobile phones. Almost two-thirds believed that text ads on their mobile phones were annoying, but only 43% of the responders to mobile offers thought that text ads were annoying, and almost half (45%) of the non-responders to mobile offers reported a lack of interest in the mobile offers that they received, according to the study. These findings suggest that consumer receptivity to mobile marketing is generally low.

Consumers' attitude toward mobile marketing, in turn, influences their responses to mobile promotions. A survey of 370 mobile phone users in Austria revealed that customers' attitudes toward and perceived control of mobile (m)-coupons affected their intention to redeem such coupons (Dickinger and Kleijnen 2008). Specifically, the study showed that the effort involved in redeeming m-coupons strongly affected customer attitudes toward m-coupons and fear of mobile spam influenced customers' perceived control in the context of mobile marketing. In general, much of mobile marketing today is viewed as being intrusive (Shankar and Hollinger 2007).

The findings suggest that marketers will have to work diligently to enhance customer receptiveness to mobile marketing in the broader population, and, in the short run, need to focus on customers who are receptive to these initiatives. Furthermore, marketers will need to conduct further research to identify and pursue specific product categories and marketing activities that are amenable to mobile marketing initiatives. The ability to contact and send messages to customers on an anytime, anywhere basis offers a wealth of new opportunities

but also the temptation to overuse or misuse those opportunities. The challenge is to utilize interactive mobile technologies to disseminate marketing messages in a sophisticated manner that customizes the offering(s) to target customers.

Moving forward, to further understand the implications of managerial decisions related to mobile marketing, it is necessary to explore how consumers can be affected by such marketing at various stages of their own decision processes. Knowledge about these effects can inform managers about the nature and timing of appropriate mobile marketing efforts. We propose that the framework described in Fig. 1 can anchor future research in the area.

The framework describes two metastages in the customer decision sequence related to mobile marketing. The first metastage relates to mobile device or service adoption discussed earlier. This stage is important because, without such adoption, subsequent mobile marketing initiatives are irrelevant. The second metastage of the framework comprises the well-known stages in the customer decision-making process — need recognition, information search, alternative evaluation, purchase and post-purchase (e.g., Balasubramanian et al. 2005; Wilding et al. 2009). Researchers can examine how mobile marketing initiatives can affect each of these stages. The framework highlights two important issues. First, it stresses the need to examine how mobile marketing can potentially exert economic, sociological, and psychological influences on customer decision-making at each of these stages. Second, it suggests that researchers must carefully consider how competition, the product or service type, and the integration of mobile marketing with overall marketing strategy moderate these influences.

Deconstructing the customer decision sequence as described in Fig. 1 can provide insights into the effect of mobile marketing on each stage. For example, consider how mobile marketing may affect need creation/recognition. To be effective, advertising messages need to overcome the physical (sensory) and psychological (emotional) barriers erected by customers. In this regard, mobile advertising lacks the persuasive power of the print and TV media due to the highly constrained screen size and the sparseness of information that can be presented within the typical mobile interface. However, location-based advertising can provide timely and actionable information to customers. Drawing from the Elaboration Likelihood Model/ELM (Petty and Cacioppo 1986), it appears that mobile advertising is best suited for highlighting existing needs and possibly creating new needs in the context of products and services that call for low customer involvement levels from potential customers. Specifically, in line with the ELM, mobile advertising can tap into consumers' peripheral route to persuasion that focuses on the presentation of timely and attention-catching information to the customer, rather than into the central route to persuasion that calls for intensive processing of detailed information.

Alternatively, mobile advertising can be used to supply specific pieces of information to facilitate a high-involvement purchase. For example, to encourage a quick transaction from a proximate customer, an electronics store could communicate a targeted price-reduction coupon for a large screen TV set to a customer who has asked to be informed about price promotions on that TV set. In particular, for high-involvement products and services, the more information-rich channels such as the Internet and print media would be required to build the case for the customer to choose the offer. The mobile channel can then play its role at an appropriate stage of the purchase process. Similarly, we can analyze the other stages of the decision-making process.

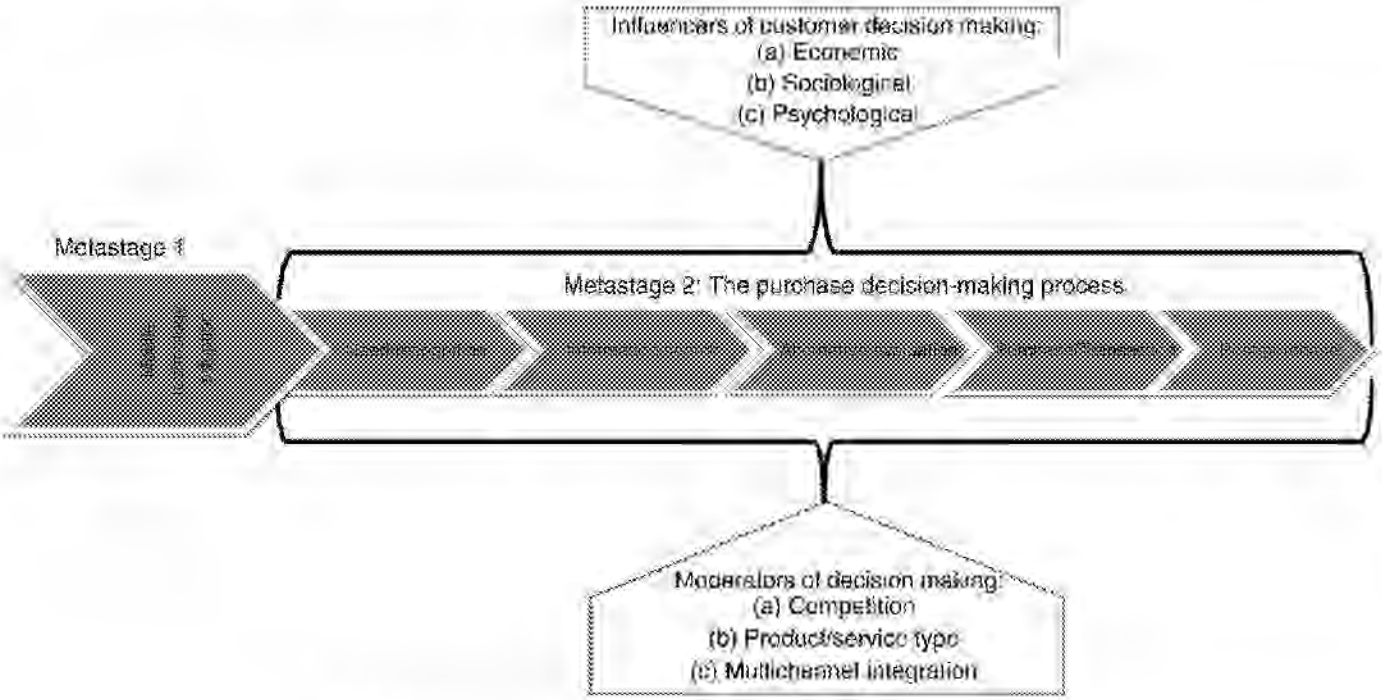


Fig. 1. The impact of mobile marketing on customer decision making: a framework.

Apart from providing a better understanding of customer decision-making in the context of mobile marketing, the framework suggests some unanswered questions that are ripe for research. Customers differ in their response to mobile marketing initiatives and the use of mobile media to acquire products and services. How does customer decision-making vary across the decision-making stages in Fig. 1? Can a marketer use these differences as a basis for customer segmentation in the mobile marketing context? To what extent should such segmentation be guided by attitudes toward mobile marketing within the various stages of the decision-making process, relative to revealed behaviors at these stages?

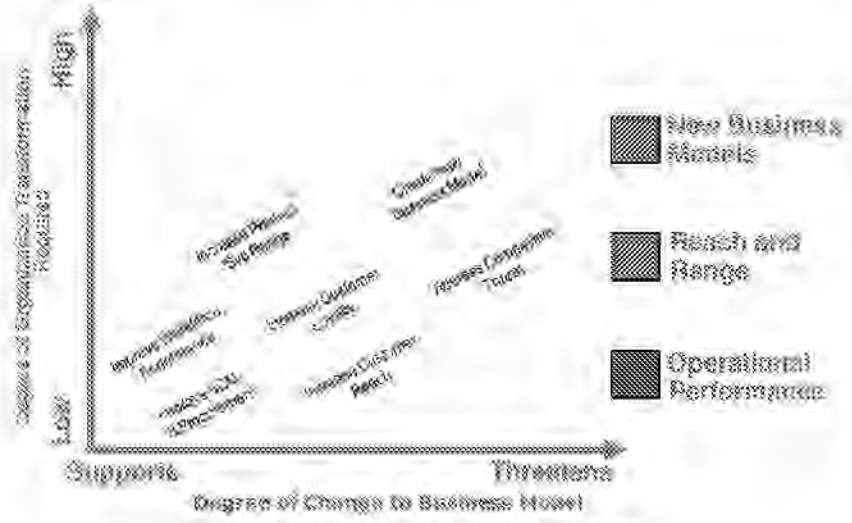
With regard to post-purchase behavior, research shows that after controlling for selection, online customers are more loyal than offline customers, so migrating customers from offline to online could enhance customer loyalty (Shankar, Smith, and Rangaswamy 2003). In a similar vein, can mobile marketing be used to improve customer loyalty? User-generated-content (UGC) or consumer-generated content is becoming popular on the Internet through sites such as YouTube.com and MySpace.com. Such sites are being replicated in the mobile environment through services such as Cyworld in South Korea and SeeMeTV in the U.K. (Hodgson 2006). Will the opportunity to create content and consume content developed by other users through mobile devices enhance customer loyalty to a firm? These questions merit deep investigation.

Formulation of a mobile marketing strategy and choice of methods

With a better understanding of the drivers of mobile device and services adoption and the role of mobile marketing in customer decision-making, marketers can develop a more effective mobile marketing strategy. The framework that Shankar, O'Driscoll, and Reibstein (2003) suggest (see Fig. 2) is useful in formulating a firm's mobile marketing strategy. The strategy can be viewed along two dimensions: the degree of change to the business model, and the degree of organizational transformation required. Depending on the combinations of the levels of these dimensions, a firm can adopt one of three overall mobile marketing strategies.

When both the need to change the business model and the need for organizational transformation are low, then the firm should follow the "operational performance" strategy. This strategy involves the use of mobile media and communications for supply chain and workforce productivity improvement. When both the need to change the business model and the need for organizational change are at moderate levels, then the recommended strategy is a "reach and range" strategy. Initiatives under this strategy include enhancing product/service range, improving loyalty, and increasing customer reach. When both the need to change the business model and the need for organizational transformation are high, then the firm should adopt a "new business models" strategy. Under this strategy, the firm fundamentally alters its structure and market strategy, or changes the way it does business to address competitive threats.

Once a firm formulates a suitable mobile marketing strategy, it needs to select appropriate mobile marketing methods that are consistent with the chosen strategy. Mobile marketing or mobile advertising methods include text messaging, integrated content, games, interactive voice response, wireless access protocol (WAP) sites, ring-tones and ring-back tones, viral, geotargeting, mobile broadcast advertising, cell phone sponsorships, and mobile telemarketing. A summary of the methods with their cost, pros and cons are shown in Table 3 (*Advertising Age* 2005). Text messaging, the most popular mobile marketing method, is useful for sweepstakes, contest voting, and instantly redeemable offers. The main advantages of text messaging are that it is simple for both the marketer and the consumer, measurable, and has high response and conversion rates. Mobile



Source: Shankar, O'Driscoll, and Reibstein (2003)

Fig. 2. A framework for analyzing mobile marketing strategy.

Table 3
Mobile media advertising methods

Advertising approach	Summary	Cost	Positive	Negative
Text messaging	Mobile version of direct marketing can be used for sweepstakes, voting in contests, instant wins, offering consumer stats and other data.	Creative is from free to $3000 or so, but messages cost marketers 3¢ to 5¢ depending on volume, down from about 10¢ last year.	Easiest form of mobile marketing to execute, simple to fold into integrated-marketing campaigns, reaches young target; consumers get it and its technical demands don't overwhelm most U.S. phones. Some marketers report a 90% response rate and 30% conversion rate, all very measurable both in number of responses, how long it took to get a response, what carriers and handsets were used, and where the texting originated.	Consumers unhappy when marketers assume a response to a text message assumes a blast of future messages; somewhat limited from a multimedia point of view.
Integrated content	Ideal for content providers such as movie studios, media companies, financial or sports teams, with offerings such as custom news or alerts.	Cheap, $15,000 to $20,000 and packages often include a bundle of messages, plus 3¢ to 5¢ charges for additional messages.	Upside: Consumer gets relevant, valuable content.	Downside: Messages not well targeted can be viewed as annoying.
Games	Branded offerings can range from simple puzzles to custom multiplayer, multilevel adver-games that can take months to develop depending on complexity.	From $10,000 for repurposing standard generic games, say a racing game, by placing a logo over the cars, to $60,000 for a made-to-order concept.	Marketers investing in well-designed custom mobile games might find consumers willing to pay the $2.99 garnered by some games, making the mobile play a revenue generator.	Currently only an estimated 30 million of the 190 million handsets in the U.S. are equipped for games.
Interactive voice response	Opt-in consumers receive mobile phone calls from star endorsers or other talent with live updates on events, such as a huffing and puffing athlete announcing he just won a race. Variations include calls from celebrities endorsing products or teasing other content.	3¢ to 5¢ per call.	A branding play capable of a compelling personal message, with devotees such as young girls making repeat calls, and a nice added dimension for traditional, online and other media.	Messages need to be short, smart and relevant or else consumers hang up.
WAP sites	Translating existing websites into those which are wireless friendly so consumers can easily download and read PC content, download ringtones or wallpaper.	Depends on complexity of site.	Somewhat improved downloads, primarily buck and fee text messaging fulfillment.	Difficult to Web surf.
Ringtones and ring-back tones	Marketers have been giving away brand-related tones and screen savers or wallpaper, but this summer's promotions will up the ante with giveaways of tunes previously costing consumers $2 or more.	$15,000 or more.	When a corporate jingle is a cellphone's ringtone, every phone call to that number is a new broadcast of the jingle.	Ringtones are borderline obsolete because users can now make their own. Ring-back tones, those heard by callers to certain phone numbers, are hosted by carriers and would cost them extra to use for marketing.
Viral	Promotions designed to spread peer-to-peer, such as one for Budweiser that allows Web visitors to send a cellphone message to a friend inviting them for beer at a specific time and place.	$15,000 to $50,000 depending on the program, Web design, hosting etc., plus messaging costs of 3¢ to 5¢, depending on use.	Rapid spread as evidenced by distribution of ringtones among mobile-phone users, plus the ability for real-time usage reporting and other in-depth measuring.	Recipient could consider the message unsolicited, and blame the company for telephone spam.
Geotargeting	Use of GPS to ring consumers walking past a product or store with a special offer or reminder. Location-based marketing is limited but might grow starting next year when more carriers have it available.	Use of third party list of opt-in numbers can result in a $100 to $150 CPM.	A marketer's dream of reaching the right customer at the right time with the right message.	Privacy concerns and possible consumer backlash.
Advertising on mobile broadcast	Some bumper ads are showing up on video clips. For live programming ads will stream through.	No rates yet established, though most rebroadcast of live TV on mobile phones at this time are allowing for free or inexpensive pass through to mobile.	The TV in your pocket, combined with other technologies such as location-based marketing, could be one of the most powerful marketing tools ever.	Only an estimated 1 million of the 190 million cellphones in use in the U.S. are video-enabled. Consumers also may resent viewing ads when they are paying for video service.

(continued on next page)

Table 3 (continued)

Advertising approach	Summary	Cost	Positive	Negative
Sponsorships/ subsidizing cellphone costs	Marketers offset the cost of mobile service, programs or content for consumers who agree to use ads	The sky's the limit	Consumers get free mobile phones, service, content, perks, etc., marketers get benefit of offering something for free. Deals would help carriers hold onto customers longer	It's not happening now.
Mobile telemarketing	Cellphone calling is prohibited under federal regulations, but lists of consumers who have opted in are available.	Lists cost $100 or more per 1,000.	Impressive response.	Backlash from consumers if list proves faulty, or consumers forget they opted in. Mobile-phone spam could trigger significant consumer, carrier and government ire.

Source: Advertising Age/IPSU/ Freestyle Interactive/OgilvyOne.

telemarketing also has favorable response rates among those who opt-in, but if the wrong message is delivered to the wrong person at the wrong time, it can incur the wrath of consumers, carrier and government.

In selecting the mobile marketing methods to use for a campaign, mobile marketers need to (1) balance the pros and cons of each method, (2) consider the synergies among the methods, and (3) the methods used by competitors. Both business-to-consumer (B2C) and business-to-business (B2B) marketers are using these mobile marketing methods (Shankar and Hollinger 2007). In the B2C space, Johnson & Johnson uses text messaging for its optical products. A poster asks optometry patients with mobile devices to type in "MYEYE" while they wait at the optician's or the optometrist's office. J&J then sends a reminder message or/and promotional message about its products when the patient is in the doctor's office (Cano 2005). In the B2B space, Federal Express (FedEx) uses the text messaging and geotargeting methods synergistically. It sends messages to business executives who have chosen to receive FedEx message about document services when they are near a FedEx Kinko's location.

Whereas a sound mobile marketing strategy pursued with appropriate methods can be effective, we expect that few firms will rely solely on mobile marketing. Rather, mobile marketing may be a powerful complement to other marketing activities of a firm, and a substitute for only a limited set of those activities. Accordingly, it appears that mobile marketing best fits into the "reach and range" strategy. The key marketing decisions under a mobile marketing strategy include those on marketing communication (advertising and sales promotion), delivery of digital products and services, and customer relationship management (customer service and support).

At a high level, a number of questions remain unresolved in the context of a firm's mobile marketing strategy. A central issue relates to how the firm's mobile strategy meshes with the firm's overall marketing strategy. In this context, how should the mobile strategy complement or substitute elements of the firm's overall marketing strategy? Specifically, how should advertising campaigns be redesigned to include a mobile element, and how should that element link to initiatives in mass media or on the Internet? Mobile marketing may be associated with economies of scope in this context, in which case it can increase overall marketing efficiency and effectiveness. For example, customer response rates may improve significantly if mobile marketing campaigns are pursued in coordination with email and/or direct mail campaigns than when they are uncoordinated. Furthermore, how should a firm's mobile marketing strategy evolve across (a) the product life cycle, and (b) the customer life cycle? These questions suggest that there are ample research opportunities related to the development and execution of a mobile marketing strategy.

Mobile marketing in the global context

Whereas much of the existing research on mobile technology usage and mobile marketing has been conducted in developed economies, the most rapid growth is now occurring in developing economies, both large and small. For example, China already has the largest pool of mobile device users (360 million) and India has the largest number of new mobile adopters every month (about 3 million). Furthermore, the mobile user base is increasing manifold in many African countries, which have skipped over landline telephones and have moved directly to mobile technology. In fact, Chitra and Mahajan (2007) note that the "digital divide" – the difference between developed and developing countries in digital technology adoption and usage – may have reversed in the context of the BRIC countries (Brazil, Russia, India, and China). They claim that out of 34 categories of mobile services available worldwide, the BRIC countries have leapfrogged developed economies in mobile data, transaction, information, and video services.

Customer perceptions and firm-level marketing implications of the Internet differ across countries (Shankar and Meyer 2000, Steenkamp and Geyskens 2006). Similarly, customer behaviors and firm strategies in the mobile marketing context may also differ across countries. A few exploratory studies provide some initial evidence of such

differences. For example, among western European countries, Spain has the highest response rate (29%) to text message ads, Germany has the poorest response rate (3%), with the U.K. pegged at 18% and France at 10% (M-Metrics 2006). Compared to these countries, the response rate in the U.S. is about 7% (M-Metrics 2006). Some differences in mobile marketing across countries could be due to differences in mobile infrastructures. However, in the case of western European countries, the mobile infrastructures are similar. These arguments suggest that other factors, such as cultural influences could be responsible for some of the cross-country variations. Sultan, Rohm, and Gao (in press) draw from technology acceptance and user gratification theories to study how antecedent variables (such as consumer innovativeness, social influence, personal attachment, and privacy vulnerability) impact behavioral intent related to mobile marketing in an established market (the U.S.) and an emerging market (Pakistan). They also examine how this impact is mediated by attitudes toward mobile communications and mobile phone usage characteristics. Their findings across these two markets reflect cross-market similarities and differences related to the influence of consumer acceptance factors.

Despite these advances, on balance, relatively little is known about how the drivers of mobile device and services adoption and usage vary across countries, and about the consequences of those differences. The following questions deserve research attention in this context. To what extent are the differences in mobile marketing adoption and usage across countries driven by economic divides and by variations in culturally ingrained values and norms? To what extent are these differences driven by the stage of mobile device or service adoption, and which differences are likely to endure even in a steady state where adoption levels have peaked? What are the differences in how marketing managers across countries perceive the promises and perils of mobile devices and services? Many developing countries have poor fixed or landline-based information infrastructure, including widespread access to the Internet, but have rapidly adopted mobile devices or services. In such a scenario, how can Internet-based marketing initiatives that are now predominantly implemented and accessed through the personal computer, be replaced by mobile marketing initiatives? The answers to these questions will enrich our understanding of mobile marketing in the international context.

In addition, several other issues deserve research attention. Researchers can examine how customers define the bounds of privacy in the mobile context, and under what conditions they are willing to allow companies to breach those bounds. Likewise, researchers could examine how next-generation smart cards, which could store information about customer needs and preferences, can facilitate mobile marketing initiatives. Finally, the functionalities of multiple devices such as personal digital assistants (PDAs), cell phones, music players, cameras, and video recorders, are rapidly converging into single, multifunctional mobile devices. The relevance of such convergence for mobile marketing can be studied. Whereas a detailed discussion of these issues is beyond the scope of this paper, they merit independent investigation.

Conclusion and managerial implications

We have presented the conceptual underpinnings of mobile marketing and a synthesis of relevant literature by identifying and discussing four key issues, the drivers of mobile device/service adoption, the influence of mobile marketing on customer decision-making, the development of mobile marketing strategy, and mobile marketing in the global context. Our synthesis offers some useful insights and several directions for future research on mobile marketing. Our review reveals the following normative implications for managers of mobile marketing.

Rethink the value proposition in the mobile context

A mobile device is not a standard personal computer. It is a frequently used, location-sensitive device with very limited visual space. A mobile message will be most effective if it is brief, memorable, and well-coordinated with time and the user's location. Simply transporting a company's Internet marketing strategy to mobile marketing strategy could be a recipe for failure.

Get customers to opt-in

A substantial majority of customers do not appreciate unsolicited intrusions into their mobile space (Barwise and Strong 2002). Therefore, it is important to get the users to opt-in to receive mobile marketing communications through other media such as the TV, print, and the Web.[3] Users opt-in when they experience significant benefits of receiving messages (Ghose and McCulloh 2006). Initially, the messages could deliver direct and tangible benefits such as a complimentary offer for a desired product or service, but in the long-run, the messages have to be highly relevant to the customer to be successful (BusinessWeek.com 2007).

Focus first on learning about customer behavior and then on return on investment (ROI)

Customer behavior in the mobile environment is rapidly evolving. At this stage, heavy investments in mobile marketing initiatives are unlikely to yield satisfactory returns in the short run. Instead, firms must move toward placing "small bets" that, in the spirit of low-risk experimentation, allow them to probe

[3] According to Tezcan (2002), informed consent could include a mutual agreement between the mobile service provider and the customer about: (a) the number and frequency of messages; (b) the specific providers of messages (this could relate to companies sending the message, or even specific offerings about which information is transmitted; (c) the types of information transmitted; (d) the times during which such information can be transmitted; (e) the (customer) locations at which messages can be transmitted (in the case of location-based advertising); (f) the length of time the consent agreement is valid; and (g) procedures to resolve complaints and ask for deletion of customer data. From a marketing manager's viewpoint, obtaining and monitoring compliance with such consent agreements can call for significant time and resources.

and learn about how customers behave with respect to the mobile medium, and about what works and what does not work in that medium.

Look for social networking opportunities

The ability to network with friends and relatives is a major benefit for customers in online environments. The mobile device's attractive properties make it an ideal device for social communications. Mobile marketers need to look for ways to creatively embed social networking opportunities within their mobile marketing strategy.

Tie the offering to location-based benefits

In some sense, location-specificity is the most important distinguishing feature of mobile marketing. Internet marketing is far superior to mobile marketing on dimensions such as the richness of information, access to a lot of information, and applications of information that involve computations. But Internet-based marketing lacks location-specificity. Therefore, managers should focus on identifying mobile marketing opportunities that adequately leverage the customer's physical location.

Avoid overwhelming the customer with offers and messages

Managers must focus on targeting carefully customized messages to selected customers rather than indiscriminately broadcasting messages to the entire mobile customer base. Developing a database of mobile customer profiles and preferences, often using data that are collected outside the mobile medium, is a crucial first step in this context. Mobile messages should be carefully customized to customers or, at a minimum, customer groups.

We have synthesized the existing literature on mobile marketing and have delineated some of its key implications. However, much remains to be learned about mobile marketing. The growth in mobile device and services adoption and in mobile marketing offers us increased data on customer behavior. The availability of such data can spawn research relating to the many questions we have identified as fruitful areas for future research. We hope our review spurs such research and contributes to the development of additional insights on mobile marketing.

References

Advertising Age (2005), "The Ad Age Guide to Mobile Marketing," (May 2).

Ancarani, Fabio and Venkatesh Shankar (2003), "Symbian: Customer Interactions through Collaboration and Competition in a Convergent Industry," *Journal of Interactive Marketing*, 17 (1), 56–76.

Ajzen, I. (1985), "From Intentions to Actions: A Theory of Planned Behavior," in *Action Control: From Cognition to Behavior*, J. Kuhl and J. Beckmann, eds. Heidelberg:Springer, 11–39.

Balasubramanian, Sridhar, Robert A. Peterson, and Sirkka L. Jarvenpaa (2002), "Exploring the Implications of M-Commerce for Markets and Marketing," *Journal of Academy of Marketing Science*, 30 (4), 348–61.

———, Prabhudev Konana, and Nirup Menon (2003), "Customer Satisfaction in Virtual Environments: A Study of Online Investing," *Management Science*, 49 (7) 871–89.

———, Raj Raghunathan, and Vijay Mahajan (2005), "Consumers in a Multichannel Environment: Product Utility, Process Utility, and Channel Choice," *Journal of Interactive Marketing*, 19 (2) 12–30.

Bart, Yakov, Venkatesh Shankar, and Glen L. Urban (2005), "Are the Drivers and Role of Online Trust the Same for All Web Sites and Consumers? A Large-Scale Exploratory Empirical Study," *Journal of Marketing*, 69 (4), 133–52.

Barwise, Patrick and C. Strong (2002), "Permission-Based Mobile Advertising," *Journal of Interactive Marketing*, 16 (1), 14–24.

Blum, L. and S. McClellan (2006), "Mobile Users Welcome the Ads They Ask For," *Adweek* 11–11, September.

Bolton, Ruth N. and Shruti Saxena Iyer (2009), "Interactive Services: Framework, Synthesis and Research Directions," *Journal of Interactive Marketing*, 23 (1), 91–104.

BusinessWeek.com (2007), "Mobile Ad Biz Comes of Age," (accessed August 16, 2007), [available at http://www.businessweek.com/globalbiz/content/may2006/gb20060516_436148.htm?chan=search_bwmarketing_industry+trends]

Chan, S.S. and X. Fang (2001), "User Interface for Mobile Commerce," DePaul University, Unpublished manuscript.

Chircu, Alina and Vijay Mahajan (2007), "Revisiting Digital Divide: An Analysis of Mobile Technology Depth and Service Breadth in the BRIC Countries," Working Paper, University of Texas at Austin, TX.

Cimo, Alice Z. (2005), "Marketers Get Real Serious about the Third Screen," *Advertising Age*, 11 (July).

Davis, Fred D. (1989), "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology," *MIS Quarterly*, 13, 319–39.

Deighton, John, and Leora Kornfeld (2009), "Interactivity's unanticipated consequences for markets and marketing," *Journal of Interactive Marketing*, 23 (1), 4–10.

Dickinger Astrid, and Mirella Kleijnen (2008), "Coupons Going Wireless: Determinants of Adoption of Consumer Intentions to Redeem Mobile Coupons," *Journal of Interactive Marketing*, 22 (3), 23–39.

DMA (2008), "Mobile Marketing: Consumer Perspectives," New York, NY: Direct Marketing Association (July).

eMarketer (2007a), "Mobile Brand Advertising Report," New York, NY: eMarketer (October).

eMarketer (2007b), "Mobile Message Marketing Report," New York, NY: eMarketer (November).

eMarketer (2008), "Mobile Location-Based Services on the Move Report," New York, NY: eMarketer (October).

Fishbein, M. and I. Ajzen (1975), "Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research," Reading, MA: Addison-Wesley.

Gratton, E. (2002), "M-Commerce: The Notion of Consumer Consent to Receiving Location-based Advertising," *Canadian Journal of Law and Technology*, 1 (3), 59–77.

Henderson, R., D. Rickwood, and P. Roberts (1998), "Beta Test of an Electronic Supermarket," *Interacting with Computers* 10, 385–99.

Holdern, Windsor (2007), "Mobile Content from the Masses," excerpted from *Mobile User-Generated Content Dating, Social Networking, and Personal Content Delivery* 2007–2012, Juniper Research.

Gibson, Bruce (2006), "Entertaining Mobile," excerpted from *Mobile Entertainment Markets Opportunities & Forecasts*, 2006–2011, Juniper Research.

Kim K. J., Kim Y. Lee, M. Chae, and Y. Choi (2002), "An Empirical Study of the Use Contexts and Usability Problems in Mobile Internet," *Proceedings of the 35th Annual Hawaii International Conference on System Sciences*. Los Alamitos, CA:IEEE Computer Society Press.

Kim J. and J. Moon (2000), "Designing Towards Emotional Usability in Customer Interfaces—Trustworthiness of Cyber-Banking System Interfaces," *Interacting with Computers*, 10, 1–29.

Kleijnen, Mirella, Ko De Ruyter, and MartinWetzels (2004), "Consumer Adoption of Wireless Services: Discovering the Rules, While Playing the Game," *Journal of Interactive Marketing*, 18 (2), 51–61.

Kimand, Prabhudev, and Sridhar Balasubramanian (2005), "The Social–Economic Psychological (SEP) Model of Technology Adoption and Usage: An Application to Online Investing," *Decision Support Systems*, 39 (3), 505–24.

Leung, Louis and Ran Wei (2000), "More than Just Talk on the Move: Uses and Gratifications of the Cellular Phone," *Journalism and Mass Communication Quarterly*, 77, 308–20.

M-Metrics (2006), Report on Mobile Content Consumption in Western Europe.

Neslin, Scott A. and Venkatesh Shankar (2009), "Key Issues in Multichannel Management: Current Knowledge and Future Directions," *Journal of Interactive Marketing*, 23 (1), 70–81.

Nielsen Mobile (2008), "Critical Mass: The Worldwide State of the Mobile Web," IL: The Nielsen Company.

Nysveen, H., P.E. Pedersen, and H. Thorbjornsen (2005), "Intentions to Use Mobile Services: Antecedents and Cross-Service Comparisons," *Journal of the Academy of Marketing Science*, 33 (3), 330–46.

Petty, R.E. and J.T. Cacioppo (1986), "The Elaboration Likelihood Model of Persuasion," in *Advances in Experimental Social Psychology*, Vol. 19, L. Berkovitz, ed. New York: Academic Press, 123–205.

Pagani, Margherita (2004), "Determinants of Adoption of Third Generation Mobile Multimedia Services," *Journal of Interactive Marketing*, 18 (3), 46–59.

Ramsay, Marc (2000), "WAP usability report," Nielsen Norman Group.

Rogers, Everett M (1995), "Diffusion of Innovations," (4th ed.), New York: The Free Press.

Skibniac, M (2007), "What Keeps Putting Mobile Video on Hold?," *Adweek*, 48 (35), 10 2007;48(35):10.

Shankar, Venkatesh and Marie Hollinger, (2007), Online and Mobile Advertising: Current Scenario, Emerging trends, and Future Directions. Marketing Science Institute Special Report, 07–206.

Shankar, Venkatesh and Jeff Meyer (2009), "Internet and International Marketing," *Handbook of International Marketing*, Masaki Kotabe and Christiaan Helsen, eds. Sage, 451–467.

Shankar, Venkatesh and Tony O'Driscoll (2003), "Rational Exuberance: The Wireless Industry's Killer 'B.' Strategy+Business," 31 (Summer), 68–77.

Shankar, Venkatesh, Amy Smith, and Arvind Rangaswamy (2003), "Customer Satisfaction and Loyalty in Online and Offline Environments," *International Journal of Research in Marketing*, 20 (2), 153–75.

Sicnsen, Linn, Aleda Roth, and Sridhar Balasubramanian (2008), "How Motivation, Opportunity, and Ability Drive Knowledge Sharing: The Constraining Factor Model," *Journal of Operations Management*, 26, 426–45.

Silverstone, Roger and Eric Hirsch (1992), "Consuming Technologies," London: Routledge.

Skog, Berit (2002), "Mobiles and the Norwegian Teen: Identity, Gender and Class," in *Perpetual Contact*, James E. Katz and Mark Aakhus, eds. New York: Cambridge University Press.

Steenkamp, Jan. Benedict EM, and Inge Geyskens (2006), "How Country Characteristics Affect the Perceived Value of Web Sites," *Journal of Marketing*, 70 (July), 136–50.

Sultan, Fareena, Andrew J. Rohm, and Tao Gao, (in press), "Consumer Acceptance of Mobile Marketing Practices Across Established and Emerging Markets," *Journal of Interactive Marketing*.

Uglow, Sue (2007), "The Race for Mobile Content Revenues," excerpted from *Business Models for Mobile Content Providers: Strategic Options and Scenarios, 2007–2012*, Juniper Research.

Urban, Glen, Cinda Amyx, and Antonio Lorenzon (2009), "Online trust: State of the Art, New Frontiers, and Research Potential," *Journal of Interactive Marketing*, 23 (2), 179–190.

Venkatesh, Viswanath, and Fred D. Davis (2000), "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science*, 46 (2), 186–204.

——— and Anne P. Massey (2003), "Understanding Usability in Mobile Commerce," *Communications of the ACM*, 46 (12), 53–6.

Wilding R. Jagdesh N. Sheth, S. Pulendran, B. Mittal, and B.I. Newman (2003), "Consumer Behaviour — Consumer Behaviour and Beyond," Australia, Canada: Pacific Rim Ltd., Thomson.

The Choice at the Checkout: Quantifying Demand Across Payment Instruments

Ron Borzekowski[1]

Elizabeth K. Kiser[2]

February 10, 2006

Abstract

Dramatic changes have occurred in the U.S. payment system over the past two decades, most notably an explosion in electronic card-based payments. Not surprisingly, this shift has been accompanied by a series of policy debates, all of which hinge critically on understanding consumer behavior at the point of sale. Using a new nationally representative survey, we transform consumers' responses to open-ended questions on reasons for using debit cards to estimate a characteristics-based discrete-choice demand model that includes debit cards, cash, checks, and credit cards. Market shares computed using this model line up well with aggregate shares from other sources. The estimates are used to conduct several counterfactual experiments that predict consumer responses to alternative payment choices. We find that consumers respond strongly to elapsed time at the checkout counter and to whether the payment instrument draws from debt or liquidity. In addition, substitution patterns vary substantially with demographics. New "contactless" payment methods designed to replace debit cards are predicted to draw market share from cash, checks, and credit, in that order. Finally, although we find an effect of cohort on payment technology adoption, this effect is unlikely to diminish substantially over a 10-year horizon.

[1]Federal Reserve Board, 20th and C St., NW, Washington, DC 20551, ron.borzekowski@frb.gov.

[2]Federal Reserve Board, 20th and C St., NW, Washington, DC 20551, elizabeth.k.kiser@frb.gov. The views expressed herein are those of the authors and do not necessarily reflect those of the Board of Governors or the staff of the Federal Reserve System. The authors thank Elizabeth Klee for providing estimates on the checkout time for payment options, and Shaista Ahmed and Elise Tsetsi for outstanding research assistance.

1 Introduction

Technological advances and recent policy initiatives have led to substantial changes in the U.S. payment system, most notably an increasing shift from paper to plastic forms of payment.[1] Since the mid-1990's, the volume of checks has decreased dramatically, and is currently falling by about three to five percent per year, while the use of electronic payments has greatly expanded. Annual debit card transactions in the U.S. have been growing at over twenty percent per year and now exceed the number of credit card transactions. As payments have shifted from paper to plastic, the major payment card associations have been the focus of both government and private antitrust actions. These include the challenge by the U.S. Department of Justice of governance practices at Visa and MasterCard, and the civil suit led by Wal-Mart against the card associations' rules on credit and debit card acceptance.[2] Currently, the structure and level of interchange fees - the interbank payments made for each credit or debit card transaction - is a hotly debated policy area in both the U.S. and abroad.[3]

Central to these policy issues is the consumer's choice of payment instrument. While merchants can choose whether to accept a given form of payment, ultimate sovereignty rests with the consumer's choice of which instrument to pull from his or her wallet. The prior research on this topic has highlighted two key aspects to these decisions: consumer demographics and the attributes of payment methods. Carow and Staten (1999) investigate payment choice at gasoline stations and find that age and education are key factors related to debit card adoption. In more recent work,

[1] In 2001, Congress passed The Check Clearing for the 21st Century Act (Check 21), which established the legal validity of a substitute electronic version of a paper check (check conversion). The 1996 welfare reform act mandated electronic Benefit Transfer (EBT) programs be introduced by state and federal government agencies. The Electronic Fund Transfers Act (EFTA) has since been amended to refine the consumer protection laws surrounding electronic payments.

[2] The 2003 decision in U.S. vs. Visa/MasterCard required the card associations to allow bank issuers to issue multiple brands of credit and debit cards. The governance arrangements of the card associations, in which the largest card issuers occupied seats on both networks' boards, were allowed to stand. The Wal-Mart case resulted in a settlement that included an agreement that the networks rescind the "honor all cards" requirement by January 1, 2004, this change allowed merchants the option of accepting credit cards without accepting like-branded debit cards.

[3] Myriad civil suits have been filed within the past year by retail merchants and merchant trade associations against Visa, MasterCard and multiple card-issuing banks. The complaints reference the level of interchange fees as well as the networks' operating rules that affect merchant behavior when accepting credit or debit card payments. In 2003, the Reserve Bank of Australia (RBA) mandated substantial reductions in some interchanges fees, along with other changes. The EU's Competition Commission continues to scrutinize interchange fees, in the UK, the Office of Fair Trading (OFT) has established in separate decisions in 2005 that Visa and MasterCard engaged in anticompetitive practices and is pursuing further action against them.

Zinman (2005) and Borzekowski, Kiser and Ahmed (2006) find similar demographic results for debit card use, as do several studies examining the adoption of other technologies.[4] Klee (2005) presents pairwise discrete-choice estimates of payment choice as a function of consumer demographics.[5] Payment methods attributes are shown to be important by Hirschman (1982) and more recently by Jonker (2005). Hirschman identified several important product attributes that affect payment choice, including "leverage potential" and "transaction time," two factors included in our model; Jonker focuses on safety, speed, cost, and ease of use.

We build on both of these approaches by incorporating demographic information and payment attributes into a structural model. We transform our survey data to allow estimation of a discrete-choice demand model that includes both a rich set of demographic variables and selected product attributes. These are time at checkout, liquidity, and whether the payment type is electronic. In the model, utility from product attributes may vary with consumer demographics. This characteristics-based approach allows us to model the consumer's decision among bundles of attributes rather than simply among unique discrete alternatives. The structure of the model also allows the calculation of counterfactual experiments that predict consumer responses to changes in the payment choice set.

The estimation uses a new nationally representative sample of over 1,500 consumers from midyear 2004. The results indicate that consumer preferences for the three stated attributes vary significantly across demographic groups. Valuations of time, tastes for electronic payment, and the utility of liquid instruments all vary with age, education and region. Contrary to some earlier findings, income is not a significant regressor once other factors are controlled for. Predicted market shares from this model align very well with other data sources, giving us strong confidence in the approach.

Using our demand estimates, the outcomes of three counterfactual scenarios are predicted: removing options from the consumer choice set, adding a hypothetical option to the choice set, and aging the consumer population. The first examines the merchant's choice whether to accept a

[4] See, for example, Kennickell and Kwast (1997), Mantel (2000), Stavins (2001), and Hayashi and Klee (2003).

[5] Jonker (2005) and Leijx, Pepermans and Van Hove (2005) provide similar information for the Netherlands and Belgium, respectively.

given instrument. Since merchants are limited in their ability to price discriminate among payment methods, their only free margin currently is whether to accept a given instrument. (This was precisely the flexibility sought – and obtained in 2004 – in the Wal-Mart suit against Visa and MasterCard.) As a result, we predict the outcome of a merchant decision to restrict consumers' choice sets by dropping each of the four instruments. From this experiment we find that substitution patterns are somewhat asymmetric: for example, removing debit would send consumers to cash, checks, and credit, in that order, but removing checks would divert payments equally to debit and cash, then to credit.

The second experiment examines the adoption of new payment instruments. By altering the characteristics of the elements of the choice set, we estimate the impact of one new product innovation: "flash" or contactless debit. This is a technology that allows debit payments by waving the card over a transponder, rather than swiping the card, and is currently being rolled out by certain networks and several large card-issuing banks. The experiment predicts this enhanced debit technology to take a modest share from the three other options.

As a third experiment, we examine what happens as we "age" the population by examining what would happen if each age cohort adopted the preferences over attributes of the cohort behind them. As already discussed, age is an important factor in payment choice, with older individuals less likely to use debit and more likely to use checks. The outcome of this experiment indicates that cohort clearly affects payment choice, and that we do not expect this effect to disappear over a 10-year horizon.

Overall, the results indicate that debit is primarily replacing cash and checks. As newer, faster forms of debit emerge, the trend should continue, although the results from the last experiment indicate that the change may be gradual. The economic impact of these changes on merchants depends critically on merchants' relative costs of handling cash and checks, as well as on interchange rates for debit transactions. If interchange rates continue to rise, merchants could choose not to accept cards and handle the resulting increased cash and check volumes. From a societal perspective, however, debit is cheaper than either cash or paper processed checks; thus, limited

acceptance of these cards could be welfare decreasing.[6]

Finally, the findings shed light on the relatively slower adoption of debit in the U.S. compared to many other developed economies (see, for example, Bolt and Tieman (2005) and Loix et al. (2005)). Because debit serves primarily as a substitute for cash, we would predict debit card adoption rates to be faster in countries with high cash usage, such as those in Europe. In contrast, the U.S. system has historically had much higher use of credit cards and checks. Because debit is a poorer substitute for these methods, we would expect correspondingly slower adoption of debit in the U.S.

2 A New Consumer Survey

Our dataset comes from a special survey instrument issued as part of the Michigan Surveys of Consumers, which samples about 500 households per month and is constructed to be representative of U.S. households. Our dataset includes 1,501 distinct households surveyed over the months of March, April, and May 2004. The nationally representative nature of the sample is an improvement over prior studies that detail U.S. debit card use. For example, the sample for the 2005/2006 American Bankers' Association (ABA)/Dove Study of Consumer Payment Preferences (based on a 2004 survey) consists of checking account holders who voluntary responded to a written survey, with a survey response rate of about 7 percent.[7] The Michigan Survey sampling frame, in contrast, includes all U.S. households regardless of account holdings and has a considerably higher response rate (around 70 percent).

Table 1 shows checking account holdings and debit card use in our sample. Eighty-eight percent of households reported having a checking account or a similar transaction account at a depository institution; this is consistent with the 2001 Survey of Consumer Finances (SCF), another nationally representative data source.[8] About 32 percent of households (60 percent of households with a checking account) have a debit card.[9] Approximately 45 percent of households (87 percent of

[6] See, for example, Humphrey, Willesson, Lindblom and Bergendahl (2003).

[7] Dove Consulting and the American Bankers Association (2006).

[8] Eighty-nine percent of households in the 2001 SCF reported holding a checking account at some type of depository institution; the SCF definition is slightly broader than the Michigan Survey's.

[9] This number may be an undercount if some respondents with debit-enabled ATM cards were unaware of the cards' POS debit functionality.

households with a debit card) reported having used the card to purchase items at stores in the twelve months preceding the survey. The numbers on debit card use in our survey are generally consistent with results obtained in the 2005/2006 ABA/Dove study.[10]

2.1 Consumer Substitution

An important advantage of our survey is the set of open-ended questions on the reasons for choosing between debit and other payment options. Two questions were asked in this open-ended fashion: Respondents who reported using debit were asked why they use debit cards, and households who reported that they have a card but do not use debit were asked why not.[11]

For each respondent, we used keywords to construct three dummy variables for alternatives to debit: cash, check and credit. Each dummy takes on a value of 1 if the respondent mentioned that alternative payment method in their response. These variables are not mutually exclusive; more than one payment substitute could be coded. Both the first and second (if present) reported reasons were used to code these indicators.

Descriptive statistics of reported substitutes are shown in table 2 for debit card users and non-users, conditional on having a debit card. The left column shows the share of debit card users who use debit instead of the respective alternative payment type. Nearly half (48.5 percent) of debit card users mention that debit serves as a substitute for cash. About 32 percent of debit card users report using debit instead of checks, and 19 percent say debit serves as a substitute for credit cards. About 21 percent report an specific alternative payment method. These numbers suggest that debit card users view debit cards primarily as a substitute for "paper" payment methods. This question is explored further in Borzekowski et al. (2006).

The right column of table 2 shows the share of debit *non-users* who report using the respective

[10]The ABA/Dove sample reports that 83 percent of consumers have an ATM/debit card (Dove Consulting and the American Bankers Association (2005) p. 50) and that 81 percent of debit card holders use their card (p. 167). The ABA/Dove sample tends toward more affluent consumers, nearly all of whom have checking accounts and who are likely to have greater access to credit.

[11]The exact text of the questions is as follows: Households who use debit were asked, "We are interested in understanding the reasons why people use debit cards to make purchases. Why do you use your debit card to make purchases? Any other reasons?" Those who reported not using debit were asked, "We are interested in understanding why people don't use debit cards to make purchases. Why don't you use your debit card to make purchases? Any other reason?"

payment type instead of debit. Fifty-five percent refer to credit cards as preferable to debit cards; 31 percent refer to checks and 23 percent refer to cash. Twenty-three percent of debit non-users mention no alternative payment method. Thus, the majority of debit card non-users prefer credit cards to debit cards. These asymmetric findings for debit card users and non-users suggest a heterogeneous response to the underlying payment characteristics; we explore this possibility further in the estimation below.

3 Model and Estimation

To apply the demand framework, we first transform the responses to the open-ended questions on reasons for debit card use into a form that allows for estimation of a full discrete-choice model. We use the coded responses on payment choice substitutes to create rankings among the four payment options for each respondent. These rankings are then used as the outcome variables in a rank-order logit model (see Beggs, Cardell and Hausman (1981) and Hausman and Ruud (1987)) that incorporates both product and consumer characteristics. We use the coefficient estimates to construct implied choice probabilities across all four payment alternatives. Because the utility interpretation of the rank-order logit model allows us to infer a structural behavioral response on the part of consumers, we use the estimates to perform counterfactual experiments about changes in the consumer choice set.

3.1 Constructing Rankings

From the payment substitutes for debit we recorded above, we construct rankings among payment options, making modest additional assumptions on consumer preferences. The ranking algorithm is summarized in table 3. We define frequent debit users as respondents who use a debit card at least once a week; infrequent users are respondents who have used a debit card within the past 12 months but use it less than once a week. For frequent debit users, debit is ranked first, any mentioned substitute methods are ranked (tied for) second, and any remaining unmentioned substitute methods are ranked (tied for) third. For infrequent debit users, mentioned substitutes

are ranked first, and debit and any unmentioned substitutes are ranked second. For debit nonusers, mentioned substitutes are ranked first, unmentioned substitutes are ranked second, and debit is ranked third. In cases in which the respondent does not mention a substitute, all non-debit options are assumed to be tied and the rankings are adjusted accordingly.

Although the open-ended questions were asked only of debit card holders, it is useful to predict aggregate market shares for a broader set of households. Therefore, in addition to constructing rankings for debit card holders, we also constructed rankings for all checking account holders without debit cards. The extension to all checking account holders requires assumptions on how to construct rankings among payment options for estimation, as well as how to model the consumer choice sets for both estimation and market share prediction.

To create rankings for *estimation*, we assume that checking account holders *without* a debit card *choose* not to use debit; that is, that they are not exogenously constrained from using debit. Thus, we assume that checking account holders without a debit card rank cash, credit and checks equally and rank debit second to these. When predicting market shares after estimation, we similarly assume that these consumers only have three payment choices.

By constructing the rankings in this way, we make some implicit assumptions. First, the nature and structure of the survey do not control for the type of retailer at which the payment choice is made. If one assumes that for all respondents, the payment choice for which they report their preferences was their typical supermarket visit, the assumption is innocuous. If, however, some respondents recall a restaurant, others a department store and others a car dealership, then the results could be misleading. A corollary is that we assume all four options – cash, check, debit and credit – were available at whatever point of sale the customer has in mind. In addition, it is well known that payment methods vary with number of items purchased and dollar value of purchase (see Klee (2013) and others). Our model does not incorporate either the number of items or the dollar value of purchase, and therefore implicitly assumes that the amount and items bought equal those of the "typical" point-of-sale transaction. To check the robustness of our rankings, we performed the estimation using selected alternative rankings; the results do not change in any

substantive way.[12]

3.2 Utility Maximization in the Rank-Order Logit

Given the rankings, the rank-order logit model allows us to estimate consumer preferences over payment choices. Like the multinomial logit, the rank-order logit specifies implied revealed-preference inequalities generated from reported binary comparisons. These inequalities, along with a distributional assumption on unobserved heterogeneity, generate closed-form choice probabilities. Formally, we assume consumer i's utility from payment method j takes the following form:[13]

$$u_{ij} = V_{ij} + \epsilon_{ij}, \tag{1}$$

where V_{ij} is the consumer's mean utility from using payment option j, and ϵ_{ij} is a random disturbance which is distributed type I GEV. With this specification, the probability that consumer i ranks payment method j over method k is the standard logit formulation

$$\Pr(u_{ij} > u_{ik}) = \frac{\exp V_{ij}}{\exp V_{ij} + \exp V_{ik}}. \tag{2}$$

Let $R_i(r_{i1}, \ldots, r_{iJ})$ be consumer i's rankings of the available choices, where r_h gives the rank of the choice in position h. Then the probability of observing the sequence of rankings is:

$$\Pr(R_i) = \Pr[u_{ir_1} > u_{ir_2} > \ldots > u_{ir_J}] = \prod_{h=1}^{J-1} \frac{\exp V_{ir_h}}{\sum_{m=h}^{J} \exp V_{ir_m}}. \tag{3}$$

where u_{ir_h} is the utility received from the option ranked in position h. We specify this utility as

$$V_{ij} = \beta(X_i \otimes Z_j), \tag{4}$$

where X_i is a $1 \times C$ vector of consumer characteristics, Z_j is a $1 \times D$ vector of product attributes,

[12] The estimation results using the alternative rankings are available from the authors upon request.

[13] This description follows the derivation and subscripting in Beggs et al. (1981). See Allison and Christakis (1994) for a clear and concise exposition of the model.

and β is a $(L'D) \times 1$ vector of coefficients.

Substituting this into equation 3 and taking logs, the log-likelihood is:

$$L(\beta) = \sum_{i=1}^{N} log \Pr(R_i) = \sum_{i=1}^{N} \sum_{h=1}^{J} +\beta(X_i \otimes Z_h) \sum_{i=1}^{N} \sum_{h=1}^{J} [\log \sum_{m=h}^{J} \exp(\beta(X_i - Z_h))] \tag{5}$$

Note that in this model, an individual consumer's relative preference for any two choices is assumed to be independent of all other choices. In other words, a consumer's preference for, e.g., debit over credit is independent of the availability or the relative rankings of the other choices available. This is a variant of the usual *independence of irrelevant alternatives (IIA)* property of logit models and derives from the assumptions that the ϵ's are independent across choices and that they are extreme value distributed. However, incorporating interaction terms between consumer and choice-specific characteristics implies that the IIA property is relaxed at the *aggregate* level.[14]

The interactions between household and product attributes allow the utility from product attributes to vary across consumers. The product attributes Z_j used in estimation are "electronic," "liquid," and "time." Electronic is a dummy variable that takes on a value of 1 if the payment instrument is electronic from the viewpoint of the consumer (i.e., debit and credit). Liquid is a dummy variable that equals 1 if the instrument draws funds from liquidity rather than from a debt instrument (i.e., all options but credit). Time is the estimated minimum time at the checkout counter for a single item purchased at a supermarket.[15] Table 4 shows the attributes for all payment choices.

Because the choice set contains four elements, the model is identified up to only three product attributes. As a result, the results may be picking up the effect of any other attributes that are

[14]Specifically, in the case of a scalar x_i and z_j, the ratio of the market shares of products j and m in the traditional multinomial logit without interaction terms is $S_j/S_m = \exp(\beta z_j - \beta z_m)$ so that the decision between choices j and m is independent of the utility from other choices. In contrast, the ratio of market shares when individual- and choice-specific interactions are included shows that the choice between j and m incorporates the utility derived from every other element of the choice set:

$$\frac{S_j}{S_m} = \frac{\frac{1}{N}\sum_{i=1}^{N} \frac{\exp(\beta x_i z_j)}{\sum_{l=1}^{J} \exp(\beta x_i z_l)}}{\frac{1}{N}\sum_{i=1}^{N} \frac{\exp(\beta x_i z_m)}{\sum_{l=1}^{J} \exp(\beta x_i z_l)}} \tag{6}$$

[15]We are grateful to Beth Klee for providing these estimates. See Klee (2008) for a detailed study of consumer response to time at the checkout counter.

highly correlated with the specified set. For example, instead of one of the attributes we included, we could have specified "anonymity" as an attribute that takes on a value of 1 only for cash. However, given the continuous variation in the time variable and the configuration of the "electronic" and "liquid" dummies taken on by each payment method, we are reasonably confident that we are interpreting the coefficients on our chosen attributes accurately.

Note that no price appears in the consumer utility function. Retail payments are unique in that consumers seldom face an explicit price associated with a given payment method. Because of the absence of price in the model, no price elasticities can be computed using the estimates. Instead, the counterfactual experiments (in particular the diversion ratios computed from dropping payment options) are used to infer substitution patterns.

The results from estimation of the rank-order logit for all checking account holders are presented in table 5. Older households appear to experience disutility from electronic payment methods and from spending out of liquidity. Households in the two youngest age groups appear the most sensitive to time at the checkout counter, as indicated by the *positive* coefficients on interactions between checkout time and the older age categories (the youngest age category is omitted). Women appear to have a preference for spending from liquidity relative to men, and men have disutility from checkout time relative to women. Single respondents and those with children are time sensitive. Respondents with a bachelors or graduate degree show disutility from spending from liquidity (or better access to credit). Small business owners show a preference for non-electronic methods. Consumers in the South and West prefer electronic payments more strongly than those in other regions, and consumers in the Northeast have the highest relative valuation of time. Overall, the coefficients show heterogeneity in preferences for product characteristics across demographic groups. We now turn to the market shares constructed from the estimates.

3.3 Predicting Market Shares

The aggregate market shares constructed using each sample are shown in Table 6. Our aggregate market shares for debit card holders are very close to those generated in the 2005/2006 ABA/Dove survey, shown for reference at the bottom of the table. Our survey shows a slightly lower share for

credit and a higher share for checks. These differences are reasonable given the selection bias of ABA/Dove toward more affluent consumers, who all have checking accounts and who are likely to have greater access to credit.

Because they are broadly representative of U.S. consumers (and because it is difficult to make out-of-sample predictions for the unbanked), we use the sample of checking account holders for the model predictions and counterfactual experiments presented below. One caveat on all the market share predictions is that they are not weighted by transaction intensity. Because payment usage rates are not constant across the population, *actual* market shares will reflect not only preferred payment methods but also the frequency of use of each payment method. This frequency will, of course, vary across merchants and types of transactions.

Recall that to create rankings for estimation, we assumed that checking account holders without a debit card are not exogenously constrained from using debit. For predicting market shares, however, we assume that the choice set for non-debit card holders is restricted to cash, credit and checks. This approach guarantees that the decision not to use debit is reflected in the estimates, but prevents non-cardholders from being predicted to use debit.

The within-sample market shares for checking account holders are shown by demographic group in Table 7, with the aggregate shares shown for reference at the bottom. To compute probabilities for each demographic variable, the values of other characteristics are set equal to the sample means within the respective group. For example, the row labeled "female" shows the probabilities that women in the sample, on average, will choose debit, credit, cash or checks. Thus, the choice probabilities reflect not only the coefficients for the respective demographic variable but also the *composition* of the demographic group.

Payment market shares vary considerably by region, with the highest debit card shares in the West, the highest cash shares in the Northeast, and the highest check shares in the Midwest. These shares are consistent with aggregate numbers from the 2005/2006 ABA/Dove survey.[16] For debit card holders, our predicted shares for debit and cash are nearly identical; our credit share is lower and our check share is higher. The differences in the credit and check shares are consistent with

[16]The ABA/Dove shares are 33 percent debit, 33 percent cash, 19 percent credit, 11 percent check, and 4 percent gift/prepaid card (Dove Consulting and the American Bankers Association (2005), p. 55).

ABA/Dove's more highly educated sample.[17]

The debit card share is generally decreasing with age, the reverse is mostly true for checks. Note that the check shares are highest for respondents aged 45-64 rather than for those 65 and older, this finding is consistent with recent popular-press writeups of Baby Boomers' slow adoption of automated debit for receiving paychecks and other payments.[18] The credit card share is highest for respondents age 65 or older, at around 26 percent, likely reflecting the improved access to credit that results from both a longer credit history and a higher income, both of which are positively correlated with age. (Note that from the regression coefficients, these households' "preference" for spending from an illiquid instrument appears to offset their aversion to using electronic methods.)

Shares differ somewhat by gender, with higher debit card and check shares for women, and higher cash and credit card shares for men. This may reflect differences in shopping patterns, driven by household division of labor, between these two groups. Nonwhites show a greater cash share and a lower check share than whites. Marital status is predictive of shares, with considerably higher cash use by singles, and lower credit and higher check use among divorced respondents.

Respondents with less than a high school education are more likely to choose cash, at a share of about 40 percent, while those with a graduate degree are more likely than others to choose credit, at a share of about 31 percent. Check shares appear to decrease with education level. Perhaps surprisingly, relatively little variation occurs in market shares by income group, and none of the relationships is monotonic in income.

4 Counterfactual Experiments

The model generates choice probabilities which aggregate to market shares and incorporates both product and consumer characteristics. We use the model estimates to compute the outcomes of several relevant counterfactual experiments. We perform three types of experiments: (1) dropping each option from the consumer choice set, (2) creating a hypothetical new payment option in the

[17] See Dove Consulting and the American Bankers Association (2007) p. 35.

[18] See Nordvall (2006). The propensity of households aged 65 or older to use direct deposit is likely influenced by exogenous exposure to this technology: Recipients of Social Security payments and other government benefits are required to receive them using direct deposit. We speculate that Baby Boomers could alter their behavior similarly once they are exogenously exposed to direct deposit.

consumer choice set, and (3) "aging" the population to predict future payment choice.

4.1 Dropping a Payment Option from the Choice Set

The legal and policy debates surrounding payment systems hinge upon both merchant acceptance and consumer use of payment methods. Merchants now have the option of dropping any payment choice, but most do not know exactly how consumers might substitute to other payment methods if forced to do so.[19] From a policy perspective, the social costs and benefits of merchant refusal to accept a given payment method depend on consumer substitution behavior. We can use our model to directly evaluate consumer substitution of payment methods for an omitted choice, conditional on the decision to make a purchase at a given merchant.[20]

The counterfactual choice probabilities are computed for an omission of each payment choice, using the parameter estimates and sample data for respondents with a checking account and restricting the choice set to the respective remaining three options. The resulting aggregate market shares for checking account holders are shown in table 8, with the original within-sample market shares shown below for reference. Below each counterfactual share is the diversion ratio: the percentage of the decrease in market share in the omitted option captured by the respective alternate payment method. When debit cards are omitted, debit card market share is absorbed first by cash, then checks, then credit, leaving cash at by far the most popular option at about 45 percent. When cash is omitted, its initial share percent is split fairly evenly across the remaining options, with a slightly higher percent going to checks. For the omission of credit, the initial 19 percent market share goes first to cash, then to checks and debit (in the same order as the initial market shares). Finally, omitting checks results in about half its original share going to cash, followed evenly by debit and credit.

The breakdowns by demographics, shown in table 9, show similar diversion patterns. Note that an omission of debit is predicted to generate remarkably high cash shares among younger respondents, with 69 percent for the 18-24 age category. Dropping checks from the choice set

[19] Recall that the settlement of the Wal-Mart-led suit against Visa and MasterCard guaranteed that merchants can refuse to accept debit (or credit) cards.

[20] Our model does not address the issue of lost business due to refusal to accept a payment method.

causes the bulk of respondents in the oldest age category to divert to cash, followed by credit, then debit.

Although all options clearly serve as substitutes to some degree, the substitution patterns are not symmetric. For example, on average, cash is the strongest substitute for debit, but checks are the strongest substitute for cash. These effects could have a substantial impact on merchant or social costs. Thus, should a merchant refuse to accept debit, it would expect a substantial increase in cash use.[21] Borzekowski et al. (2006) find a substantial price response with respect to debit card fees charged by card-issuing banks; the estimates here suggest that those consumers are most likely to turn to cash as a substitute. According to merchant reports, cash is a relatively inexpensive method of payment for merchants to accept; however, from a societal standpoint, cash production and handling is costly for both governments and depository institutions.[22] On the other hand, if cash use were discouraged, merchants might expect a surge in check payments.[23] Although the largest retailers have sophisticated check processing and check fraud protection programs in place, smaller merchants do not, and they (along with depository institutions) could face cost increases from greater check use.[24]

4.2 Adding a New Payment Option to the Choice Set

Predicting consumer demand for new payment instruments is highly relevant for both public policy and industry strategy. Large-scale investments by firms or governments are typically necessary to launch a new payment technology, especially due to the network effects inherent in such systems, and estimates of consumer behavior can help predict how consumers might respond to such investments in infrastructure. The inclusion of product characteristics into consumer utility in our model means that, by combining product attributes to form new payment options, we can calculate predictions

[21] In 2003, during the dispute with MasterCard over interchange fees, Wal-Mart temporarily stopped accepting MasterCard signature debit. No data on consumer response to this move are publicly available.

[22] See Humphrey et al. (2003).

[23] Although to our knowledge no widespread programs have been implemented by retail merchants to actively discourage cash use, highway toll systems and public transportation systems have implemented programs to encourage electronic payments rather than cash. See, for example, Ammann, Jankowski and Porter's (2005) analysis of the effects of higher toll prices for cash users on the Illinois Tollway.

[24] The cost of check processing is in decline following the enactment of Check 21 in 2004, which established the legal validity of a substitute electronic version of a paper check. This allows any merchant to "truncate" a paper check at the point of sale and present the check electronically for payment by the issuing depository institution.

of consumer response to hypothetical introductions to the choice set.

For our computation, we replace an already available payment option with a "new" option by altering the characteristics of the existing option.[25] The example we choose is a hypothetical "flash" or "contactless" transaction for which a consumer waves a card or touches a screen to initiate a payment that draws funds from a deposit account.[26] Such a payment option would access liquidity using an electronic format but would be quicker than debit. We compute counterfactual market shares by "replacing" debit with flash; that is, we replace the attributes of debit with those of flash transactions by reducing the time at the checkout to a conservative industry estimate for that of flash while retaining the other two attributes.[27] We assume that flash time is approximately 15 seconds less than cash (about 30 seconds less than debit).[28]

This exercise assumes that flash payment cards are issued by banks and accepted at retail merchants in the same proportions as debit cards, and that adoption is costless for consumers. Nonetheless, because our estimate of the time at checkout for flash transactions is conservative, we view this counterfactual experiment as realistic.

The hypothetical choice probabilities that include flash transactions are shown in table 10, with the original within-sample choice probabilities shown for reference. The model predicts that flash transactions would achieve a market share of around 26 percent, about 40 percent greater than the current market share for debit. Flash transactions are predicted to draw consumers first from cash, then checks, followed by credit. Thus, merchants are unlikely to be able to use flash transactions to reduce the credit card share of transactions (with an associated high interchange fee); however, from a societal perspective, flash payments may be a successful tool to increase the share of electronic transactions. In addition to the overall market shares, the table shows predicted probabilities by age, income and gender. Adoption is predicted to be fairly equal across demographic groups, with

[25] An alternative approach would be to compute market shares by adding a fifth element to the choice set. However, because of our limited attributes set, we prefer the current approach of viewing flash as a replacement for debit.

[26] Several initiatives have been recently introduced by depository institutions and payment card associations. See, e.g., Dunleavey (2005) and Rueter (2005). Some of those payment methods are similar to the transponder-based store card common at certain gasoline retailers, which requires the customer only to wave the card in front of a receiver at the gas pump, or to transponder-based highway toll collection.

[27] Recall that to estimate the original model, we entered product characteristics as $\bar{Z}_j = \{I\{electronic\}, I\{liquid\}, time\ (in\ seconds)\}$, with $Z_{debit} = \{1, 1, 50.43\}$. To compute new choice probabilities for flash debit, we replace Z_{debit} with $\bar{Z}_{flash} = \{1, 1, 20\}$.

[28] See Bradford (2005) and Digital Transactions News (2005).

the exception of a stronger cash preference for respondents age 18-24 relative to older respondents. As discussed above, a caveat to these predictions is that the parameter estimates for checkout time may reflect a preference for any other characteristics of the respective payment methods that are correlated with checkout time.

To summarize, our inference from this experiment suggests that the adoption of flash technology is likely to result in small changes in overall market shares. We predict flash transactions will draw consumers mainly from paper-based methods rather than from credit cards.

4.3 Aging the Population to Predict Future Payment Choice

Because debit cards themselves have yet to diffuse fully into the economy, it is useful to predict future adoption rates in order to evaluate the future effects of policy or industry changes. Because we estimate age-specific coefficients for each payment attribute, we can isolate this effect on payment instrument choice from the effects of other factors, such as family structure and home ownership, which are also correlated with age.

Note that because we use a cross section rather than a panel, we cannot identify separate effects for age and cohort. We assume that the age coefficient reflects a cohort effect. For example, in the case of debit, for which use is decreasing in age, we assume that older individuals are empirically less likely to adopt debit because its characteristics comprise a new technology, and not because of a differential response to its characteristics that derives purely from chronological age.

We perform the experiment of "aging the population" in the following way. We first reset the values of the cohort-specific coefficients so that each cohort takes on the coefficient of the next youngest cohort, holding the coefficient for the youngest (omitted) cohort and those of all other demographics at their original values. This ages each cohort by about 10 years (less for the youngest age group, and more for the oldest). We then recompute choice probabilities using respondents' original demographic variables and the new coefficient vector. The effect of this computation is to roll the population forward one cohort while holding constant the distribution of other demographic variables. This approach allows individual respondents to "age" with respect to income, educa-

tion, and family structure, without changing the overall distribution of demographics.[29] We then compute aggregate payment market shares along with market shares by demographic group. The difference between the within-sample and counterfactual market shares can therefore be attributed solely to the cohort effect.

The aggregate counterfactual market shares show that aging the population results in slightly higher debit and cash shares and slightly lower credit and check shares. Debit draws proportionally the most from checks. These predictions are consistent with the strong preference of the current younger respondents for quick checkout being applied to older generations' hypothetical payment preferences. The choice probabilities continue to show substantial differences across demographic groups. As expected, the debit card share is predicted to increase the most among the oldest respondents, increasing from a 9- to a 14-percent market share. Overall, this exercise suggests that the cohort-specific preferences that are currently reflected in consumer payment choice will change as the population ages, but are unlikely to alter the aggregate shares dramatically for the 10-year horizon.

5 Conclusion

This paper uses a recent nationally representative survey on U.S. payment preferences at the point of sale to investigate consumers' use of debit cards, credit cards, checks and cash. We demonstrate a method for transforming responses to open-ended survey questions into ranked outcome variables that can be used in a characteristics-based discrete-choice demand system. We then estimate our demand system allowing utility from payment method characteristics to vary with demographic characteristics. Using these estimates, we compute aggregate market shares for each payment instrument and perform the counterfactual experiments of dropping payment methods, predicting demand for an emerging payment method, and synthetically aging the population.

We find that our market shares square well with those computed in other surveys. The market shares vary systematically with age, education, and gender, but less so with income, reflecting the

[29] Our approach also implies that each cohort takes on the fixed demographics (gender and ethnicity) of the next cohort up. More favorably stated, it shows a change in hypothetical payment choice due to a change in cohort, leaving constant the effects of other demographic shifts in the population.

compelling motives for payment choice that vary with income. From our counterfactual experiments we predict that merchant refusal to accept payments – or other initiatives to alter consumer payment choice – will have differential effects by payment type. That is, substitution patterns are not symmetric. Our experiment predicting the market share of a newly developed "contactless" payment method, which could replace debit cards if new initiatives take hold, suggests this method will attract modest market shares and will draw mainly from paper-based methods. Finally, after synthetically aging the population, we predict that debit is unlikely to make major inroads over a 10-year horizon based purely on the aging of a population with cohort-specific preferences.

Several questions remain open as areas for future research. First, why has debit rather than credit taken the bulk of business away from checks and cash (even for higher-income, non-credit-revolving households)? What is the saturation point for debit card use? Is there a base level of cash and check use that will remain even after debit cards and similar payment technologies have diffused fully into the economy? Answers to these questions and others will help us to understand more fully the complex problem of payment choice.

Table 1: Sample composition

	Sample Size	*Percent of Sample*
Total Interviewed	1,501	100.0
Checking Account Holders	1,316	87.67
Debit Card Holders	783	52.17
Debit Card Users	674	44.90

Table 2: Debit cards vs. other payment methods: Substitution

Substitute *	*Percent Who Use Debit Instead Of Substitute (Users=674):*	*Percent Who, Instead of Debit, Use Substitute: (Non-Users=109):*
Cash	48.5	22.9
Check	31.9	31.2
Credit	19.4	55.1
Indeterminate	21.4	22.9

* Categories are not mutually exclusive.

Table 3: Ranking Algorithm

Payment Method	*Frequent Debit User**	*Infrequent Debit User*	*Debit Non-User*
Debit	1	2	3
Mentioned Substitute	2	1	1
Unmentioned Substitute	3	2	2

*Frequent users are defined as those who use a debit card for purchases once a week or more.

Table 4: Attributes of Payment Methods

Payment Method	*Electronic*	*Liquid*	*Time* *
Debit	1	1	50.43
Cash	0	1	34.75
Credit	1	0	55.13
Check	0	1	77.53

*Estimated minimum time in seconds at checkout for a single item purchased at a supermarket, from dataset used in Klee (2005).

Table 6: Parameter Estimates from Rank-Order Logit Model

Demographic Characteristic	*Electronic*	*Liquid*	*Time*
Midwest	-.468**	-.276	.004
	(.178)	(.221)	(.006)
Northeast	-.543***	-.402*	-.017***
	(.191)	(.231)	(.006)
South	-.193	-.268	-.003
	(.165)	(.205)	(.005)
25-34 yrs	.197	-.032	.009
	(.270)	(.351)	(.010)
35-44 yrs	-.120	-.251	.020**
	(.270)	(.353)	(.010)
45-54 yrs	-.403	-.402	.025**
	(.280)	(.358)	(.010)
55-64 yrs	-.595**	-.753**	.028***
	(.297)	(.375)	(.010)
65 or older	-1.321***	-1.845***	.023**
	(.324)	(.398)	(.010)
Female	.198	.116***	.014***
	(.124)	(.152)	(.004)
Non-white	-.035	-.071	-.007
	(.157)	(.190)	(.005)
Single	.044	-.004	-.013***
	(.179)	(.214)	(.006)
Divorced	.011	.142*	.012**
	(.160)	(.200)	(.006)
Some college	.186	-.209	.003
	(.168)	(.208)	(.006)
Bachelors degree	-.014	-.503**	.0004
	(.161)	(.227)	(.006)
Graduate degree	-.052	-1.155***	-.003
	(.207)	(.250)	(.006)

continued on next page

Table 5: *continued*

Demographic Characteristic	*Electronic*	*Liquid*	*Time*
Has one or more children	.047	.103	-.009**
	(.142)	(.177)	(.005)
$35,000-$59,999	.079	.172	.002
	(.182)	(.227)	(.006)
&60,000-$99,999	.136	.229	.003
	(.188)	(.233)	(.006)
$100,000 or more	.179	.138	.004
	(.232)	(.287)	(.007)
Business phone in household	-.322	-.228	-.010
	(.200)	(.249)	(.006)
Const.	-.052	.788*	-.030**
	(.364)	(.459)	(.012)
Obs.	1208	1208	1208

***Significant at 1% level.

**Significant at 5% level.

*Significant at 10% level.

Note: All predictions estimated on population of checking account holders (1,310 observations).

Table 6: Predicted Market Shares

	Payment Method			
Predicted for (N)	*Debit*	*Cash*	*Credit*	*Check*
Debit Card Holders *(783)*	32.5	33.5	13.2	20.9
Checking Account Holders *(1,916)*	16.6	37.4	19.0	27.0
All Consumers *(1,501)*	14.4	45.7	16.5	23.4

Note: All predictions for debit card holders estimated on population of debit card holders, otherwise estimated on population of checking account holders.

Table 7: Predicted Market Shares by Demographic Group

Predicted for (N)	*Debit*	*Cash*	*Credit*	*Check*
Region				
West *(251)*	20.9	33.1	20.0	26.0
Midwest *(342)*	14.7	35.2	17.1	32.9
Northeast *(253)*	13.0	17.6	18.8	29.6
South *(470)*	17.7	35.9	20.0	26.5
Age				
18-24 yrs *(80)*	21.7	53.8	11.3	10.2
25-34 yrs *(180)*	27.3	40.0	17.3	15.3
35-44 yrs *(260)*	21.1	36.9	17.1	24.9
45-54 yrs *(202)*	15.6	34.8	16.8	32.8
55-64 yrs *(232)*	12.4	32.1	20.1	35.4
65 and older *(269)*	6.0	38.8	26.6	28.6
Gender				
Male *(611)*	14.6	41.3	21.6	22.4
Female *(705)*	18.3	34.1	16.7	30.9
Race				
White *(1,103)*	16.1	36.5	19.4	28.0
Non-white *(213)*	19.1	41.9	16.9	21.8
Marital Status				
Married *(775)*	16.6	35.6	20.1	27.7
Single *(340)*	16.9	46.6	19.6	16.9
Divorced *(199)*	16.3	29.3	13.6	40.8
Education				
Less than high school *(420)*	15.0	41.1	14.4	29.4
Some college *(382)*	19.7	35.3	16.7	28.3
Bachelors degree *(402)*	17.5	37.1	19.2	26.2
Graduate degree *(205)*	12.7	34.4	31.7	21.2
Children				
No children *(877)*	14.1	35.9	20.5	29.1
One or more children *(438)*	21.3	40.1	16.1	22.4
Income				
Less than $35,000 *(325)*	14.5	39.5	18.3	27.7
$35,000 - $59,000 *(304)*	17.6	36.5	16.9	29.0
$60,000 - $99,999 *(332)*	18.3	36.9	18.7	26.1
$100,000 or more *(254)*	15.9	36.6	22.8	24.7
All checking account holders *(1,316)*	16.6	37.4	19.0	27.0

Note: All predictions estimated on population of checking account holders.

Table 8: Dropping Payment Options

Payment Option Dropped	*Market Share*			
	Debit	*Cash*	*Credit*	*Check*
Debit		45.3	22.5	32.2
		(47.6)	(21.1)	(31.3)
Cash	20.7		31.3	42.1
	(27.0)		(32.9)	(40.4)
Credit	20.0	46.6		33.3
	(17.9)	(48.4)		(33.2)
Check	22.5	51.1	26.4	
	(21.9)	(50.7)	(27.4)	
Original shares	16.6	37.4	19.0	27.0

Note: All predictions estimated on population of checking account holders. Numbers in parentheses are diversion ratios, calculated as the percentage of the decrease in the dropped option's market share drawn by each alternative payment option.

Table 9: Dropping Payment Options by Demographic Group

	Counterfactual Market Shares				*Within-Sample Market Shares*			
Payment Option Dropped	*Debit*	*Cash*	*Credit*	*Check*	*Debit*	*Cash*	*Credit*	*Check*
Debit								
Age								
18-24 yrs		70.8	15.2	14.0	24.7	53.8	11.3	10.2
25-34 yrs		54.9	23.7	21.4	27.3	40.0	17.3	15.3
35-44 yrs		46.6	21.5	31.9	21.1	36.9	17.1	24.9
45-54 yrs		41.1	19.0	39.9	15.6	34.8	16.8	32.8
55-64 yrs		36.6	22.8	40.5	12.4	32.1	20.1	35.4
65 and older		11.3	28.2	30.5	6.0	38.8	26.6	28.6
Education								
Less than high school diploma		49.0	16.7	34.3	15.0	41.4	14.4	29.3
Some college		44.6	20.7	34.7	19.7	35.3	16.7	28.3
Bachelors degree		45.3	23.2	31.5	17.5	37.1	19.2	26.2
Graduate degree		30.5	36.2	21.2	12.7	34.4	31.7	21.2
Gender								
Male		48.8	25.1	26.1	14.6	41.3	21.6	22.4
Female		42.3	20.3	37.4	18.3	34.1	16.7	30.9
Cash								
Age								
18-24 yrs	50.3		28.4	21.3	24.7	53.8	11.3	10.2
25-34 yrs	45.6		39.9	24.5	27.3	40.0	17.3	15.3
35-44 yrs	36.2		27.3	36.5	21.1	36.9	17.1	24.9
45-54 yrs	26.1		26.1	47.6	15.6	34.8	16.8	32.8
55-64 yrs	21.5		29.8	48.7	12.4	32.1	20.1	35.4
65 and older	14.6		41.0	44.4	6.0	38.8	26.6	28.6
Education								
Less than high school diploma	28.9		25.2	45.8	15.0	41.4	14.4	29.3
Some college	32.8		27.0	40.3	19.7	35.3	16.7	28.3
Bachelors degree	31.2		30.3	38.5	17.5	37.1	19.2	26.2
Graduate degree	22.0		47.5	30.5	12.7	34.4	31.7	21.2
Gender								
Male	28.3		36.2	35.5	14.6	41.3	21.6	22.4
Female	30.5		25.6	43.9	18.3	34.1	16.7	30.9

continued on next page

Table 8: *continued*

	Counterfactual Market Shares				*Within-Sample Market Shares*			
Payment Option Dropped	*Debit*	*Cash*	*Credit*	*Check*	*Debit*	*Cash*	*Credit*	*Check*
Credit								
Age								
18-24 yrs	29.4	59.1		11.5	21.7	53.8	11.3	10.2
25-34 yrs	33.9	18.2		17.8	27.3	40.0	17.3	15.3
35-44 yrs	28.1	43.8		28.1	21.1	36.9	17.1	24.9
45-54 yrs	21.3	39.8		39.0	15.6	34.8	16.8	32.8
55-64 yrs	18.0	41.3		40.7	12.4	32.1	20.1	35.4
65 and older	12.2	50.2		37.7	6.0	38.8	26.6	28.6
Education								
Less than high school diploma	20.0	46.5		33.6	15.0	41.4	14.4	29.3
Some college	25.0	42.5		32.5	19.7	35.3	16.7	28.3
Bachelors degree	24.1	44.5		31.0	17.5	37.1	19.2	26.2
Graduate degree	21.2	18.7		30.1	12.7	34.4	31.7	21.2
Gender								
Male	24.3	50.9		27.8	14.6	41.3	21.6	22.4
Female	33.9	40.3		35.8	18.3	34.1	16.7	30.9
Check								
Age								
18-24 yrs	28.6	57.1	14.3		24.7	53.8	11.3	10.2
25-34 yrs	33.1	46.3	20.6		27.3	40.0	17.3	15.3
35-44 yrs	30.9	47.1	22.0		21.1	36.9	17.1	24.9
45-54 yrs	26.4	48.1	25.5		15.6	34.8	16.8	32.8
55-64 yrs	22.0	49.0	29.0		12.4	32.1	20.1	35.4
65 and older	12.8	51.7	35.5		6.0	38.8	26.6	28.6
Education								
Less than high school diploma	21.2	54.9	20.9		15.0	41.4	14.4	29.3
Some college	28.3	47.9	23.9		19.7	35.3	16.7	28.3
Bachelors degree	26.6	47.9	25.5		17.5	37.1	19.2	26.2
Graduate degree	18.8	41.7	39.6		12.7	34.4	31.7	21.2
Gender								
Male	21.5	50.7	27.8		14.6	41.3	21.6	22.4
Female	28.3	47.5	24.2		18.3	34.1	16.7	30.9
All checking account holders					16.6	37.4	19.0	27.0

Note: All predictions estimated on population of checking account holders.

Table 10: Market Shares for New Payment Technology

Characteristic	*Market Share*			
	Flash	*Cash*	*Credit*	*Check*
Age				
18-24 yrs	43.0	41.0	8.4	7.5
25-34 yrs	46.3	29.6	12.9	11.2
35-44 yrs	38.2	29.0	13.4	19.4
45-54 yrs	29.9	29.0	14.1	27.1
55-64 yrs	24.9	27.6	17.3	30.2
65 and older	13.2	35.8	24.6	26.4
Education				
Less than high school	28.3	34.7	12.3	24.7
Some college	35.2	28.1	13.6	23.1
Bachelors degree	32.4	30.2	15.8	21.6
Graduate degree	24.8	29.6	27.4	18.3
Gender				
Male	27.8	34.7	18.4	19.1
Female	33.3	27.5	13.7	25.4
All checking account holders	30.8	30.8 (-46.5)	15.9 (-21.8)	22.5 (-31.7)
Original shares	16.6 (Debit)	37.4	19.0	27.0

Note: All predictions estimated on population of checking account holders. Flash market shares are computed assuming the payment method has the electronic and liquid attributes of debit and the time attributes of flash, using an industry estimate (20 seconds). Numbers in parentheses are diversion ratios, calculated as the percentage of the increase in the flash market share drawn from each alternative payment option.

Table 11: Predicted Market Shares for Debit Card Holders: Aging the Population

	Market Share			
	Debit	*Cash*	*Credit*	*Check*
Age				
18-24 yrs	24.7	53.8	11.3	10.2
25-34 yrs	24.2	48.6	14.2	13.0
35-44 yrs	20.3	40.5	16.3	16.9
45-54 yrs	19.3	35.0	17.8	27.9
55-64 yrs	15.2	34.6	17.3	32.9
65 and older	12.1	36.2	19.2	32.5
Education				
Less than high school diploma	18.8	42.1	12.0	27.0
Some college	22.8	37.4	14.8	25.0
Bachelors degree	20.1	39.8	17.2	22.8
Graduate degree	15.0	37.3	28.6	19.0
Gender				
Male	17.5	43.2	19.1	20.2
Female	21.6	36.1	14.7	27.6
All checking account holders	19.7	39.4	16.7	24.2
Original shares	16.6	37.4	19.0	27.0

Note: All predictions estimated on population of checking account holders.

References

Allison, Paul D. and Nicholas A. Christakis. "Logit Models for Sets of Ranked Items." *Sociological Methodology*, 1994, *24*, 199–228.

Amromin, Gene, Carrie Jankowski, and Richard D. Porter. "Transforming Payment Choices by Doubling Fees on the Illinois Tollway," 2005. Federal Reserve Bank of Chicago working paper.

Beggs, S., S. Cardell, and J. Hausman. "Assessing the Potential Demand for Electric Cars." *Journal of Econometrics*, September 1981, *17* (1), 1–19.

Bolt, Wilko and Alexander F. Tieman. "Skewed Pricing in Two-Sided Markets: An IO Approach," January 2005. Working paper, De Nederlandsche Bank.

Borzekowski, Ron, Elizabeth K. Kiser, and Shaista Ahmed. "Debit Card Use by U.S. Consumers: Evidence from a New Survey," January 2006. Working paper, Federal Reserve Board.

Bradford, Terri. "Contactless: The Next Payment Wave?," *Payment System Research Briefing*, December 2005. Federal Reserve Bank of Kansas City.

Carow, Kenneth A. and Michael E. Staten. "Debit, Credit, and Cash: Survey Evidence on Gasoline Purchases." *Journal of Economics and Business*, 1999, *51* (5), 409–422.

Digital Transactions News. "Absence of Fee Break Could Hinder RFID's Penetration of Cash," November 2005.

Dove Consulting and the American Bankers Association. "Study of Consumer Payment Preferences 2004/2005," December 2005.

Dunleavey, M. P. "In the Blink of an Eye, You've Paid." *The New York Times*, 2005, *December 17*, C5.

Hausman, Jerry A. and Paul A. Ruud. "Specifying and testing econometric models for rank-ordered data," *Journal of Econometrics*, January - February 1987, *34* (1,2), 83–104.

Hayashi, Fumiko and Elizabeth Klee. "Technology Adoption and Consumer Payments: Evidence from Survey Data," *Review of Network Economics*, June 2003, *2* (2), 175–190.

Hirschman, Elizabeth. "Consumer Payment Systems: The Relationship of Attribute Structure to Preference and Usage," *Journal of Business*, 1982, *55* (4), 531–545.

Humphrey, David, Magnus Willesson, Ted Lindblom, and Goran Bergendahl, "What Does it Cost to Make a Payment?," *Review of Network Economics*, 2003, *2* (2), 159–174.

Jonker, Nicole, "Payment Instruments as Perceived by Consumers – a Public Survey," September 2005. Working paper, De Nederlandsche Bank.

Kennickell, Arthur B. and Myron L. Kwast, "Who Uses Electronic Banking? Results from the 1995 Survey of Consumer Finances," July 1997. Prepared for presentation at the Annual Meetings of the Western Economic Association, Seattle, Washington.

Klee, Elizabeth, "Families' Use of Payment Instruments During a Decade of Change in the U.S. Payment System," November 2005. Working paper, Federal Reserve Board.

Loix, Ellen, Roland Pepermans, and Leo Van Hove, "Who's Afraid of the Cashless Society? Belgian Survey Evidence," October 2005. Working paper, Free University of Brussels.

Mantel, Brian, "Why Do Consumers Pay Bills Electronically? An Empirical Analysis," *Economic Perspectives*, 2000, (Quarter IV), 32–47.

Nordwall, Eric, "Boomers Avoid Direct Deposit," *USA Today*, December 27, 2005, p. B1.

Rueter, Thad, "Contactless Payments: Smooth Sailing, So Far," *Cards and Payments*, December 2005, *18* (9), 20–24.

Stavins, Joanna, "Effect of Consumer Characteristics on the Use of Payment Instruments," *New England Economic Review*, 2001, (3), 19–31.

Zinman, Jonathan, "Debit or Credit?," 2005. Working paper, Dartmouth University.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8328094	B2	2012-12-11	Proud, et al.	
	2	8417561	B2	2013-04-09	Ghosh, et al.	
	3	7937286	B2	2011-05-03	Newman,et al.	
	4	8027691	B2	2011-09-27	Preston, et al.	
	5	8255269	B2	2012-08-28	Rane et al.	
	6	7792697	B2	2010-09-07	Bhagchandani, et al.	
	7	7328169	B2	2008-02-05	Temares, et al.	
	8	6839682	B1	2005-01-04	Blume, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.S/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

	9	6078891	A	2000-06-20	Riordan, et al.	
	10	5832458	A	1998-11-03	Jones	
	11	9208461	B2	2015-12-08	Arzumanyan, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code1	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100070376	A1	2010-03-18	Proud, et al.	
	2	20110196754	A1	2011-08-11	Proud, et al.	
	3	20030016550	A1	2003-01-23	Rotman, et al.	
	4	20070100728	A1	2007-05-03	Rotman, et al.	
	5	20100076813	A1	2010-03-25	Ghosh, et al.	
	6	20090006151	A1	2009-01-01	Zargham, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.S/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

	7	20070050229	A1	2007-03-01	Tatro, et al.	
	8	20060151598	A1	2006-07-13	Chen, et al.	
	9	20020026348	A1	2002-02-28	Fowler, et al.	
	10	20070055597	A1	2007-03-08	Patel, et al.	
	11	20030216881	A1	2003-11-20	Tillman	
	12	20100010905	A1	2010-01-14	Arzumanyan, et al.	
	13	20110087519	A1	2011-04-14	Fordyce, III et al.	
	14	20100280881	A1	2010-11-04	Faith, et al.	
	15	20120109709	A1	2012-05-03	Fordyce, III et al.	
	16	20140372184	A1	2014-12-18	Blumenthal	
	17	20160247111	A1	2016-08-25	Blumenthal	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.S/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/GURKANWALJIT SINGH/	Date Considered	03/28/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at [illegible] or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.S/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	939339	((point adj of adj sale) or POS or point-of-sale)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:31
S2	7132	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:33
S3	7132	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and ((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:34
S4	7132	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:35
S5	155	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:35
S6	112	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:36
S7	93	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:39

		(time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment))				
S8	37	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:40
S9	36	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:41
S10	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:42
S11	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:42
S12	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5	US-PGPUB; USPAT;	OR	ON	2014/02/14 21:44

		or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and (((payment or pay$5) near5 type) or cash or credit or (credit near3 card))	USOCR			
S13	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and ((payment or pay$5) near5 (type or cash or credit or (credit near3 card)))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:45
S14	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with (payment near5 type))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:51
S15	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:52
S17	12	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:54

		near5 (type or cash or credit or (credit near3 card))))				
S18	66	("20010016825" | "20010037250" | "20020049656" | "20020087384" | "20020087522" | "20020178451" | "20030023456" | "20030046701" | "20030093323" | "20030093798" | "20030172090" | "20030191698" | "20030220841" | "20030229897" | "20040210450" | "20050132407" | "20070050279" | "20070112673" | "20070198432" | "20080132212" | "20090132813" | "20090172035" | "20100057534" | "20100064327" | "20100189089" | "20110055915" | "20110196754" | "20110313826" | "20110314487" | "20110314488" | "20110314489" | "20110314490" | "20110314507" | "5367452" | "5412193" | "5873069" | "5973619" | "6003006" | "6014090" | "6060993" | "6133853" | "6151582" | "6177887" | "6188991" | "6343317" | "6390366" | "6460020" | "6609107" | "6754636" | "6873260" | "6882290" | "6920319" | "6988078" | "7103008" | "7171369" | "7177826" | "7206757" | "7298327" | "7535367" | "7599691" | "7681790" | "7685953" | "7747704" | "7783507" | "7797204" | "7853272").PN. OR ("8328094").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/20 18:57
S19	1	("2010/0070376").URPN.	USPAT	OR	OFF	2014/02/20 18:57
S20	14	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:57
S21	15	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:58
S22	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:59
S23	12	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:00

		(credit near3 card))))				
S24	12	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or ((credit or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:00
S25	11	("20030061132" | "20040088190" | "20050055275" | "20060080631" | "20080109375" | "20080140503" | "20080208760" | "20090299896" | "20100076812" | "20100241462" | "6070147").PN. OR ("8417561").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/20 19:02
S26	116	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:03
S27	23	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near8 card)))) and (market near3 trend)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:04
S28	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:06
S29	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:07
S30	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((market or business or retail) with	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:08

		(trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))				
S31	77	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (((trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:09
S32	20	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (((trend$4) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:11
S35	87085	(G06Q$$/$$)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:47
S36	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:48
S37	6	S36 AND ((G06Q30/0201).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:49
S38	225991	(G06Q$$/$$).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:49
S39	7159	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52
S40	4761	S38 and S39	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52

S41	157	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52
S42	137	S38 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52
S43	46555	("705").CLAS.	USPAT; USOCR	OR	OFF	2014/02/20 23:57
S44	26	S43 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:57
S45	157	S39 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:57
S46	9	S36 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:57
S47	116	((point adj of adj sale) or POS or point-of-sale) and ((trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card)))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:02
S48	14	S43 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:02
S49	6219	(705/7.$$).CCLS.	USPAT; USOCR	OR	OFF	2014/02/21 00:03
S50	4965	(705/14.$$).CCLS.	USPAT; USOCR	OR	OFF	2014/02/21 00:03
S51	6	S49 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:03
S52	0	S50 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:03
S53	113	S38 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:14
S54	75	S53 AND ((G06Q30/02 OR G06Q20/20 OR H04L2209/20 OR H04L2209/56 OR H04L2209/805 OR H04L9/3247 OR H04L63/08 OR H04L63/0823 OR H04L63/14 OR H04L63/168 OR H04L67/02 OR G06F21/60 OR G06F21/6218 OR G06F17/30716).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:21
S55	33	("20020116252" | "20100287023" | "20110251870" | "7792897" |	US-PGPUB;	OR	ON	2014/02/21 00:26

		"20040230472" | "20080033587" | "20110087546" | "6151582" | "6633851" | "20110035278" | "20110087547" | "5500513" | "7328169" | "7890367" | "20010016819" | "20050090911" | "20110093327" | "20110093335" | "7451134" | "8195500" | "20070088430" | "20080262900" | "20080270363" | "20090299536" | "20110035280" | "20110251907" | "6839682" | "8306846" | "20040225556" | "20110087519" | "20110087550" | "7937286" | "8224687").PN.	US-PGPUB; USPAT; USOCR			
S56	15	("20020026348" | "20020082920" | "20040088221" | "20060143072" | "20070055597" | "20070100728" | "20090048884" | "20090276293" | "20090327045" | "6839682" | "7328169" | "7451134" | "7792697" | "7853469" | "7890367").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:31
S57	5	("20060151598" | "20070179836" | "7937286" | "8027891" | "8255268").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:31
S58	30	("20010037206" | "20020052776" | "20020072974" | "20020107719" | "20020123957" | "20020174013" | "20030027635" | "20030088436" | "20030093414" | "20030149623" | "20030204436" | "20040059634" | "4331973" | "4355372" | "4609232" | "5822744" | "5893098" | "5913204" | "6233564" | "6236975" | "6256663" | "6334110" | "6456981" | "6505168" | "6594638" | "6778807" | "6826540" | "6836773" | "7181696" | "RE31951").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 00:32
S59	1	("6078891").PN.	USPAT; USOCR	OR	OFF	2014/02/21 00:52
S60	31	("3956615" | "4319336" | "4340810" | "4355372" | "4438824" | "4799156" | "4943963" | "4951196" | "4972504" | "5103392" | "5202977" | "5253345" | "5315093" | "5331544" | "5490060" | "5490252" | "5491473" | "5499365" | "5513102" | "5521363" | "5557518" | "5557780" | "5590196" | "5590197" | "5592378" | "5592560" | "5604804" | "5608874" | "5684965" | "5687322" | "5832460").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 00:52
S61	1	("5832458").PN.	USPAT; USOCR	OR	OFF	2014/02/21 00:53
S62	0	("20030316981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 01:01
S63	1	("20030216981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 01:01
S80	22745	transaction near5 (pattern)	US-PGPUB;	OR	ON	2018/01/19 14:52

			USPAT; USOCR			
S81	215	(transaction near5 (pattern)) same (marketing)	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S82	46	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S83	47	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S84	64	((transaction near5 (pattern)) same (marketing)) and (merchant or shop or retail or store or seller) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S85	39	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S86	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S87	9	((transaction near5 (pattern or trend)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:54
S88	22	("20020161721" | "20030055727" | "20030088460" | "20030115135" | "20030158819" | "20040039876" | "20040064373" | "20050021480" | "20050165651" | "20070050258" | "20070069013" | "20080201213" | "20100114677" | "20120253940" | "20140100932" | "20140122272" | "5448044" | "6240394" | "6636908" | "8170936" | "8548859" | "8626593").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/01/19 14:55
S89	0	("9208481").URPN.	USPAT	OR	OFF	2018/01/19 14:55
S90	81	("2011/0087519").URPN.	USPAT	OR	OFF	2018/01/19 14:55
S91	26	(US-20100070376-$ or US-20110196754-$ or US-20030018550-$ or US-20070100728-$ or US-20100076813-$ or US-20090006151-$ or US-20070050229-$ or US-20080151598-$ or US-	US-PGPUB; USPAT	OR	OFF	2018/03/18 18:44

		20020026348-$ or US-20070055597-$ or US-20030216981-$ or US-20100010905-$ or US-20110087519-$ or US-20100280891-$ or US-20120109709-$).did. or (US-6328094-$ or US-6417561$ or US-7937286-$ or US-8027891-$ or US-8255268-$ or US-7792697-$ or US-7328169-$ or US-6839682-$ or US-6078891-$ or US-5832458-$ or US-9208481-$).did.				
S92	969	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and survey	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:44
S93	1	S91 and S92	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:45
S94	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:51
S95	2032	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:54
S96	2087	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:08
S97	92	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity)	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:09
S98	15	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey)	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:11

S99	3	((transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey) and (survey with (transactional or transaction or product or (merchant or shop or retail or store or facility or facilities or seller) or (employee or staff)))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:13
S100	1043615	((point adj of adj sale) or POS or point-of-sale)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S101	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S102	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and ((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S103	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S104	328	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S105	240	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S106	193	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

		transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment))				
S107	74	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S108	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with (payment near5 type))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S109	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S110	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S111	87	("20010016825" | "20010037250" | "20020049656" | "20020087384" | "20020087522" | "20020178451" | "20030023456" | "20030046701" | "20030093323" | "20030093798" | "20030172090" | "20030191698" | "20030220841" | "20030229897" | "20040210450" | "20050132407" | "20070050279" | "20070112673" | "20070198432" | "20080132212" | "20090132813" | "20090172035" |	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08

		"20100057534" | "20100064327" | "20100189089" | "20110055915" | "20110196754" | "20110313826" | "20110314487" | "20110314488" | "20110314489" | "20110314490" | "20110314507" | "5367462" | "5412193" | "5873069" | "5973619" | "6003008" | "6014090" | "6080993" | "6133853" | "6151582" | "6177887" | "6188991" | "6343317" | "6390366" | "6460020" | "6609107" | "6754636" | "6873260" | "6882290" | "6920319" | "6988078" | "7103008" | "7171369" | "7177826" | "7206757" | "7298327" | "7535367" | "7599691" | "7681790" | "7685953" | "7747704" | "7783507" | "7797204" | "7853272").PN. OR ("8328094").URPN.				
S112	48	("2010/0070376").URPN.	USPAT	OR	OFF	2019/03/28 08:08
S113	15	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S114	17	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S115	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S116	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S117	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or ((credit or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S118	16	("20030061132" | "20040088190" |	US-	OR	OFF	2019/03/28

		"20050055275" | "20060080631" | "20080109375" | "20080140503" | "20080208760" | "20090299896" | "20100076812" | "20100241462" | "6070147").PN. OR ("8417561").URPN.	PGPUB; USPAT; USOCR			08:08
S119	162	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S120	29	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card)))) and (market near3 trend)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S121	19	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S122	19	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S123	40	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((market or business or retail) with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S124	178	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((trend$4 or data or information or course	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

		or direction)) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))				
S125	24	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((trend$4) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S126	202552	(G06Q$$/$$)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S127	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S128	8	S127 AND ((G06Q30/0201).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S129	386556	(G06Q$$/$$).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S130	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S131	8930	S129 and S130	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S132	328	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S133	309	S129 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

S134	53842	("705").CLAS.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S135	85	S134 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S136	328	S130 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S137	10	S127 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S138	162	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S139	18	S134 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S140	7260	(705/7.$$).CCLS.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S141	6415	(705/14.$$).CCLS.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S142	9	S140 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S143	2	S141 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S144	145	S129 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S145	81	S144 AND ((G06Q30/02 OR G06Q20/20 OR H04L2209/20 OR H04L2209/56 OR H04L2209/805 OR H04L9/3247 OR H04L63/08 OR H04L63/0823 OR H04L63/14 OR H04L63/168 OR H04L67/02 OR G06F21/60 OR G06F21/6218 OR G06F17/30716).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S146	33	("20020116252" | "20100287029" | "20110251870" | "7792697" | "20040230472" | "20060033587" | "20110087546" | "6151582" | "6633851" | "20110035278" | "20110087547" | "5500513" | "7328169" | "7890367" | "20010016819" | "20050090911" | "20110093327" | "20110093335" | "7451134" | "8195500" | "20070083430" | "20080262900" | "20080270363" | "20090299536" | "20110035280" | "20110251907" | "6839682" | "8306846" | "20040225556" | "20110087519" | "20110087550" | "7937286" | "8224687").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

S147	15	("20020026348" | "20020082920" | "20040088221" | "20060143072" | "20070055597" | "20070100728" | "20090048884" | "20090276293" | "20090327045" | "6839682" | "7328169" | "7451134" | "7792697" | "7853469" | "7890367").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S148	5	("20060151598" | "20070179836" | "7937286" | "8027891" | "8255268").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S149	30	("20010037206" | "20020052776" | "20020072974" | "20020107719" | "20020123957" | "20020174013" | "20030027635" | "20030088436" | "20030093414" | "20030149623" | "20030204436" | "20040059634" | "4331973" | "4355372" | "4603232" | "5822744" | "5893098" | "5913204" | "6233564" | "6236975" | "6256663" | "6334110" | "6456981" | "6505168" | "6594638" | "6778807" | "6826540" | "6836773" | "7181696" | "RE31951").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S150	1	("6078891").PN.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S151	31	("3956615" | "4319336" | "4340810" | "4355372" | "4438824" | "4799156" | "4943963" | "4951196" | "4972504" | "5103392" | "5202977" | "5253345" | "5315093" | "5331544" | "5490060" | "5490252" | "5491473" | "5499385" | "5513102" | "5521363" | "5557518" | "5557780" | "5590196" | "5590197" | "5592378" | "5592560" | "5604804" | "5608874" | "5684965" | "5687322" | "5832460").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S152	1	("5832458").PN.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S153	0	("20030316981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S154	1	("20030216981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S155	25535	transaction near5 (pattern)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S156	231	(transaction near5 (pattern)) same (marketing)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S157	50	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S158	51	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or	US-PGPUB;	OR	ON	2019/03/28 08:08

		point of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	USPAT; USOCR			
S159	70	((transaction near5 (pattern)) same (marketing)) and (merchant or shop or retail or store or seller) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S160	44	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S161	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S162	11	((transaction near5 (pattern or trend)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S163	22	("20020161721" | "20030055727" | "20030088460" | "20030115135" | "20030158819" | "20040039676" | "20040064373" | "20050021480" | "20050165651" | "20070050258" | "20070069013" | "20080201213" | "20100114677" | "20120253940" | "20140100932" | "20140122272" | "5448044" | "6240394" | "6636908" | "8170936" | "8548859" | "8626593").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:09
S164	2	("9208481").URPN.	USPAT	OR	OFF	2019/03/28 08:09
S165	120	("2011/0087519").URPN.	USPAT	OR	OFF	2019/03/28 08:09
S166	26	(US-20100070376-$ or US-20110196754-$ or US-20030018550-$ or US-20070100728-$ or US-20100076613-$ or US-20090006151-$ or US-20070050229-$ or US-20060151598-$ or US-20020026348-$ or US-20070055597-$ or US-20030216981-$ or US-20100010905-$ or US-20110087519-$ or US-20100280891-$ or US-20120109709-$).did. or (US-8328094-$ or US-6417561-$ or US-7957286-$ or US-8027891-$ or US-8255268-$ or US-7792697-$ or US-7328169-$ or US-6839682-$ or US-6078891-$ or US-5832458-$ or US-9208481-$).did.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:09
S167	1039	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5	US-PGPUB; USPAT;	OR	ON	2019/03/28 08:09

		or send$5) with (data or ((sale or transaction) near3 information) or information)) and survey	USOCR			
S168	1	S166 and S167	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S169	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S170	2285	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S171	2357	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S172	102	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S173	16	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S174	4	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey) and (survey with (transactional or transaction or product or (merchant or shop or retail or store or facility or facilities or seller) or (employee	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09

		or staff)))				
S175	28	(US-20100070376-$ or US-20110196754-$ or US-20030018550-$ or US-20070100728-$ or US-20100076613-$ or US-20090006151-$ or US-20070050229-$ or US-20060151598-$ or US-20020026348-$ or US-20070055597-$ or US-20030216981-$ or US-20100010906-$ or US-20110087519-$ or US-20100280881-$ or US-20120109709-$ or US-20140372184-$ or US-20160247111-$).did. or (US-8328094-$ or US-8417561-$ or US-7937286-$ or US-8027891-$ or US-8255268-$ or US-7792697-$ or US-7328169-$ or US-6039682-$ or US-6078891-$ or US-5832458-$ or US-9206481-$).did.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:35

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S33	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2014/02/20 19:22
S34	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or general$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and ((payment or pay$5) near5 (type or cash or credit or (credit near3 card)))	US-PGPUB; USPAT	OR	ON	2014/02/20 19:22
S64	223608	(G06Q$$/$$).cpc.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:53
S65	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54

		(credit near3 card))))				
S66	9	S64 and S65	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S67	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and ((payment or pay$5) near5 (type or cash or credit or (credit near3 card)))	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S68	15	S64 and S67	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S69	18	(TAVARES near3 SILVIO).in.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S70	12	(FAHY near3 SUSAN).in.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S71	56	(CARLSON near3 DENNIS).in.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:55
S72	11	S69 and S70 and S71	US-PGPUB; USPAT	OR	ON	2014/02/20 23:56
S73	140309	("705").CLAS.	US-PGPUB; USPAT	OR	OFF	2014/02/20 23:58
S74	21889	(705/14.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/02/20 23:59
S75	17951	(705/7.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/02/20 23:59
S76	118	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2014/02/21 00:00
S77	113	S64 and S76	US-PGPUB; USPAT	OR	ON	2014/02/21 00:21
S78	25	S74 and S76	US-PGPUB; USPAT	OR	ON	2014/02/21 00:22
S79	13	S75 and S76	US-PGPUB; USPAT	OR	ON	2014/02/21 00:22

S176	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S177	385401	(G06Q$$/$$).cpc.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S178	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S179	10	S177 and S178	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S180	33	(TAVARES near3 SILVIO).in.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S181	19	(FAHY near3 SUSAN).in.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S182	63	(CARLSON near3 DENNIS).in.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S183	18	S180 and S181 and S182	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S184	176792	("705").CLAS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:08
S185	29517	(705/14.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:08
S186	24235	(705/7.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:08
S187	162	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S188	145	S177 and S187	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S189	28	S185 and S187	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S190	19	S186 and S187	US-PGPUB;	OR	ON	2019/03/28 08:08

			USPAT			
S191	28	"Term Removed" or "Term Removed"	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:34
S192	26	S191 AND ((G06Q30/02 OR G06Q20/20 OR G06Q30/0201 OR G06Q30/0202 OR G06Q30/0205 OR G06Q10/06375 OR G06Q10/06395 OR G07G1/14 OR G07G1/0009 OR Y04S10/54 OR G06F16/2358 OR H04B5/0025 OR Y10S707/99933).CPC.)	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:36
S193	170230	(G06Q30/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:36
S194	85264	(G06Q20/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:36
S195	159310	(G06Q10/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S196	7225	(G07G1/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S197	37399	(Y04S10/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S198	245124	(G06F16/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S199	13681	(H04B5/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:38
S200	54531	(Y10S707/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:38
S201	25988	("706").CLAS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:39
S202	81959	("235").CLAS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:39
S203	40	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((market or business or retail) with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debit or debit) near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:39

3/28/2019 10:41:27 AM
C:\Users\gsingh\Documents\EAST\Workspaces\16279387 transaction specific customer survey system.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	939339	((point adj of adj sale) or POS or point-of-sale)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:31
S2	7132	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:33
S3	7132	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and ((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:34
S4	7132	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:35
S5	155	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:35
S6	112	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:36
S7	93	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:39

		(time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment))				
S8	37	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:40
S9	36	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:41
S10	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:42
S11	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:42
S12	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5	US-PGPUB; USPAT;	OR	ON	2014/02/14 21:44

		or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and (((payment or pay$5) near5 type) or cash or credit or (credit near3 card))	USOCR			
S13	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and ((payment or pay$5) near5 (type or cash or credit or (credit near3 card)))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/14 21:45
S14	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with (payment near5 type))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:51
S15	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:52
S17	12	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:54

		near5 (type or cash or credit or (credit near3 card))))				
S18	66	("20010016825" | "20010037250" | "20020049656" | "20020087384" | "20020087522" | "20020178451" | "20030023456" | "20030046701" | "20030093323" | "20030093798" | "20030172090" | "20030191698" | "20030220841" | "20030229897" | "20040210450" | "20050132407" | "20070050279" | "20070112673" | "20070198432" | "20080132212" | "20090132813" | "20090172035" | "20100057534" | "20100064327" | "20100189089" | "20110055915" | "20110196754" | "20110313826" | "20110314487" | "20110314488" | "20110314489" | "20110314490" | "20110314507" | "5367452" | "5412193" | "5873069" | "5973619" | "6003006" | "6014090" | "6060993" | "6133853" | "6151582" | "6177887" | "6188991" | "6343317" | "6390366" | "6460020" | "6609107" | "6754636" | "6873260" | "6882290" | "6920319" | "6988078" | "7103008" | "7171369" | "7177826" | "7206757" | "7298327" | "7535367" | "7599691" | "7681790" | "7685953" | "7747704" | "7783507" | "7797204" | "7853272").PN. OR ("8328094").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/20 18:57
S19	1	("2010/0070376").URPN.	USPAT	OR	OFF	2014/02/20 18:57
S20	14	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:57
S21	15	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:58
S22	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 18:59
S23	12	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:00

		((credit near3 card))))				
S24	12	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or ((credit or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:00
S25	11	("20030061132" | "20040088190" | "20050055275" | "20060080631" | "20080109375" | "20080140503" | "20080208760" | "20090299896" | "20100076812" | "20100241462" | "6070147").PN. OR ("8417561").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/20 19:02
S26	116	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:03
S27	23	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near8 card)))) and (market near3 trend)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:04
S28	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:06
S29	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:07
S30	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((market or business or retail) with	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:08

		(trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))				
S31	77	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (((trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:09
S32	20	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (((trend$4) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 19:11
S35	87085	(G06Q$$/$$)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:47
S36	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:48
S37	6	S36 AND ((G06Q30/0201).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:49
S38	225991	(G06Q$$/$$).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:49
S39	7150	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52
S40	4761	S38 and S39	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52

S41	157	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52
S42	137	S38 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:52
S43	46555	("705").CLAS.	USPAT; USOCR	OR	OFF	2014/02/20 23:57
S44	26	S43 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:57
S45	157	S39 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:57
S46	9	S36 and S41	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/20 23:57
S47	116	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:02
S48	14	S43 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:02
S49	6219	(705/7.$$).CCLS.	USPAT; USOCR	OR	OFF	2014/02/21 00:03
S50	4965	(705/14.$$).CCLS.	USPAT; USOCR	OR	OFF	2014/02/21 00:03
S51	6	S49 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:03
S52	0	S50 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:03
S53	113	S38 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:14
S54	75	S53 AND ((G06Q30/02 OR G06Q20/20 OR H04L2209/20 OR H04L2209/56 OR H04L2209/805 OR H04L9/3247 OR H04L63/08 OR H04L63/0823 OR H04L63/14 OR H04L63/168 OR H04L67/02 OR G06F21/60 OR G06F21/6218 OR G06F17/30716).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:21
S55	33	("20020116252" | "20100287023" | "20110251870" | "7792897" |	US-PGPUB;	OR	ON	2014/02/21 00:26

		"20040230472" | "20080033587" | "20110087546" | "6151582" | "6633851" | "20110035278" | "20110087547" | "5500513" | "7328169" | "7890367" | "20010016819" | "20050090911" | "20110093327" | "20110093335" | "7451134" | "8195500" | "20070088430" | "20080262900" | "20080270363" | "20090299536" | "20110035280" | "20110251907" | "6839682" | "8306846" | "20040225556" | "20110087519" | "20110087550" | "7937286" | "8224687").PN.	US-PGPUB; USPAT; USOCR			
S56	15	("20020026348" | "20020082920" | "20040088221" | "20060143072" | "20070055597" | "20070100728" | "20090048884" | "20090276293" | "20090327045" | "6839682" | "7328169" | "7451134" | "7792697" | "7853469" | "7890367").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:31
S57	5	("20060151598" | "20070179836" | "7937286" | "8027891" | "8255268").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/02/21 00:31
S58	30	("20010037206" | "20020052776" | "20020072974" | "20020107719" | "20020123957" | "20020174013" | "20030027635" | "20030088436" | "20030093414" | "20030149623" | "20030204436" | "20040059634" | "4331973" | "4355372" | "4609232" | "5822744" | "5893098" | "5913204" | "6233564" | "6236975" | "6256663" | "6334110" | "6456981" | "6505168" | "6594638" | "6778807" | "6826540" | "6836773" | "7181696" | "RE31951").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 00:32
S59	1	("6078891").PN.	USPAT; USOCR	OR	OFF	2014/02/21 00:52
S60	31	("3956615" | "4319336" | "4340810" | "4355372" | "4438824" | "4799156" | "4943963" | "4951196" | "4972504" | "5103392" | "5202977" | "5253345" | "5315093" | "5331544" | "5490060" | "5490252" | "5491473" | "5499365" | "5513102" | "5521363" | "5557518" | "5557780" | "5590196" | "5590197" | "5592378" | "5592560" | "5604804" | "5608874" | "5684965" | "5687322" | "5832460").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 00:52
S61	1	("5832458").PN.	USPAT; USOCR	OR	OFF	2014/02/21 00:53
S62	0	("20030316981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 01:01
S63	1	("20030216981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/02/21 01:01
S80	22745	transaction near5 (pattern)	US-PGPUB;	OR	ON	2018/01/19 14:52

			USPAT; USOCR			
S81	215	(transaction near5 (pattern)) same (marketing)	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S82	46	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S83	47	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S84	64	((transaction near5 (pattern)) same (marketing)) and (merchant or shop or retail or store or seller) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S85	39	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S86	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:53
S87	9	((transaction near5 (pattern or trend)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/19 14:54
S88	22	("20020161721" | "20030055727" | "20030088460" | "20030115135" | "20030158819" | "20040039876" | "20040064373" | "20050021480" | "20050165651" | "20070050258" | "20070069013" | "20080201213" | "20100114677" | "20120253940" | "20140100932" | "20140122272" | "5448044" | "6240394" | "6636908" | "8170936" | "8548859" | "8626593").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/01/19 14:55
S89	0	("9208481").URPN.	USPAT	OR	OFF	2018/01/19 14:55
S90	81	("2011/0087519").URPN.	USPAT	OR	OFF	2018/01/19 14:55
S91	26	(US-20100070376-$ or US-20110196754-$ or US-20030018550-$ or US-20070100728-$ or US-20100076813-$ or US-20090006151-$ or US-20070050229-$ or US-20080151598-$ or US-	US-PGPUB; USPAT	OR	OFF	2018/03/18 18:44

		20020026348-$ or US-20070055597-$ or US-20030216981-$ or US-20100010905-$ or US-20110087519-$ or US-20100280891-$ or US-20120109709-$).did. or (US-6328094-$ or US-6417561$ or US-7937286-$ or US-8027891-$ or US-8255268-$ or US-7792697-$ or US-7328169-$ or US-6839682-$ or US-6078891-$ or US-5832458-$ or US-9208481-$).did.				
S92	969	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and survey	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:44
S93	1	S91 and S92	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:45
S94	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:51
S95	2032	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 18:54
S96	2087	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:08
S97	92	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity)	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:09
S98	15	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey)	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:11

S99	3	((transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey) and (survey with (transactional or transaction or product or (merchant or shop or retail or store or facility or facilities or seller) or (employee or staff)))	US-PGPUB; USPAT; USOCR	OR	ON	2018/03/18 19:13
S100	1043615	((point adj of adj sale) or POS or point-of-sale)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S101	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S102	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and ((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S103	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S104	328	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S105	240	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S106	193	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

		transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment))				
S107	74	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S108	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with (payment near5 type))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S109	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S110	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S111	87	("20010016825" | "20010037250" | "20020049656" | "20020087384" | "20020087522" | "20020178451" | "20030023456" | "20030046701" | "20030093323" | "20030093798" | "20030172090" | "20030191698" | "20030220841" | "20030229897" | "20040210450" | "20050132407" | "20070050279" | "20070112673" | "20070198432" | "20080132212" | "20090132813" | "20090172035" |	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08

		"20100057534" | "20100064327" | "20100189089" | "20110055915" | "20110196754" | "20110313826" | "20110314487" | "20110314488" | "20110314489" | "20110314490" | "20110314507" | "5367462" | "5412193" | "5873069" | "5973619" | "6003008" | "6014090" | "6080993" | "6133853" | "6151582" | "6177887" | "6188991" | "6343317" | "6390366" | "6460020" | "6609107" | "6754636" | "6873260" | "6882290" | "6920319" | "6988078" | "7103008" | "7171369" | "7177826" | "7206757" | "7298327" | "7535367" | "7599691" | "7681790" | "7685953" | "7747704" | "7783507" | "7797204" | "7853272").PN. OR ("8328094").URPN.				
S112	48	("2010/0070376").URPN.	USPAT	OR	OFF	2019/03/28 08:08
S113	15	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S114	17	((point adj of adj sale) or POS or point-of-sale) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S115	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S116	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S117	16	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5 or transaction) near5 (type or method or cash or credit or ((credit or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S118	16	("20030061132" | "20040088190" |	US-	OR	OFF	2019/03/28

		"20050055275" | "20060080631" | "20080109375" | "20080140503" | "20080208760" | "20090299896" | "20100076812" | "20100241462" | "6070147").PN. OR ("8417561").URPN.	PGPUB; USPAT; USOCR			08:08
S119	162	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S120	29	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card)))) and (market near3 trend)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S121	19	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S122	19	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (market with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S123	40	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((market or business or retail) with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S124	178	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((trend$4 or data or information or course	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

		or direction)) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))				
S125	24	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((trend$4) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debt or debit) near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S126	202552	(G06Q$$/$$)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S127	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S128	8	S127 AND ((G06Q30/0201).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S129	386556	(G06Q$$/$$).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S130	15133	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S131	8930	S129 and S130	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S132	328	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S133	309	S129 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

S134	53842	("705").CLAS.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S135	85	S134 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S136	328	S130 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S137	10	S127 and S132	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S138	162	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S139	18	S134 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S140	7260	(705/7.$$).CCLS.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S141	6415	(705/14.$$).CCLS.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S142	9	S140 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S143	2	S141 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S144	145	S129 and S138	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S145	81	S144 AND ((G06Q30/02 OR G06Q20/20 OR H04L2209/20 OR H04L2209/56 OR H04L2209/805 OR H04L9/3247 OR H04L63/08 OR H04L63/0823 OR H04L63/14 OR H04L63/168 OR H04L67/02 OR G06F21/60 OR G06F21/6218 OR G06F17/30716).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S146	33	("20020116252" | "20100287029" | "20110251870" | "7792697" | "20040230472" | "20060033587" | "20110087546" | "6151582" | "6633851" | "20110035278" | "20110087547" | "5500513" | "7328169" | "7890367" | "20010016819" | "20050090911" | "20110093327" | "20110093335" | "7451134" | "8195500" | "20070083430" | "20080262900" | "20080270363" | "20090299536" | "20110035280" | "20110251907" | "6839682" | "8306846" | "20040225556" | "20110087519" | "20110087550" | "7937286" | "8224687").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08

S147	15	("20020026348" | "20020082920" | "20040088221" | "20060143072" | "20070055597" | "20070100728" | "20090048884" | "20090276293" | "20090327045" | "6839682" | "7328169" | "7451134" | "7792697" | "7853469" | "7890367").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S148	5	("20060151598" | "20070179836" | "7937286" | "8027891" | "8255268").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S149	30	("20010037206" | "20020052776" | "20020072974" | "20020107719" | "20020123957" | "20020174013" | "20030027635" | "20030088436" | "20030093414" | "20030149623" | "20030204436" | "20040059634" | "4331973" | "4355372" | "4603232" | "5822744" | "5893098" | "5913204" | "6233564" | "6236975" | "6256663" | "6334110" | "6456981" | "6505168" | "6594638" | "6778807" | "6826540" | "6836773" | "7181696" | "RE31951").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S150	1	("6078891").PN.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S151	31	("3956615" | "4319336" | "4340810" | "4355372" | "4438824" | "4799156" | "4943963" | "4951196" | "4972504" | "5103392" | "5202977" | "5253345" | "5315093" | "5331544" | "5490060" | "5490252" | "5491473" | "5499385" | "5513102" | "5521363" | "5557518" | "5557780" | "5590196" | "5590197" | "5592378" | "5592560" | "5604804" | "5608874" | "5684965" | "5687322" | "5832460").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S152	1	("5832458").PN.	USPAT; USOCR	OR	OFF	2019/03/28 08:08
S153	0	("20030316981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S154	1	("20030216981").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:08
S155	25535	transaction near5 (pattern)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S156	231	(transaction near5 (pattern)) same (marketing)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S157	50	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:08
S158	51	((transaction near5 (pattern)) same (marketing)) and merchant and ((POS or	US-PGPUB;	OR	ON	2019/03/28 08:08

		point of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	USPAT; USOCR			
S159	70	((transaction near5 (pattern)) same (marketing)) and (merchant or shop or retail or store or seller) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S160	44	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S161	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S162	11	((transaction near5 (pattern or trend)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S163	22	("20020161721" | "20030055727" | "20030088460" | "20030115135" | "20030158819" | "20040039676" | "20040064373" | "20050021480" | "20050165651" | "20070050258" | "20070069013" | "20080201213" | "20100114677" | "20120253940" | "20140100932" | "20140122272" | "5448044" | "6240394" | "6636908" | "8170936" | "8548859" | "8626593").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/03/28 08:09
S164	2	("9208481").URPN.	USPAT	OR	OFF	2019/03/28 08:09
S165	120	("2011/0087519").URPN.	USPAT	OR	OFF	2019/03/28 08:09
S166	26	(US-20100070376-$ or US-20110196754-$ or US-20030018550-$ or US-20070100728-$ or US-20100076613-$ or US-20090006151-$ or US-20070050229-$ or US-20060151598-$ or US-20020026348-$ or US-20070055597-$ or US-20030216981-$ or US-20100010905-$ or US-20110087519-$ or US-20100280891-$ or US-20120109709-$).did. or (US-8328094-$ or US-6417561-$ or US-7957286-$ or US-8027891-$ or US-8255268-$ or US-7792697-$ or US-7328169-$ or US-6839682-$ or US-6078891-$ or US-5832458-$ or US-9208481-$).did.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:09
S167	1039	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit)) with (collect$5 or record$5 or transmit$5	US-PGPUB; USPAT;	OR	ON	2019/03/28 08:09

		or send$5) with (data or ((sale or transaction) near3 information) or information)) and survey	USOCR			
S168	1	S166 and S167	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S169	7	((transaction near5 (pattern)) same (marketing)) and ((merchant or shop or retail or store or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S170	2285	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and (transaction with (path or route))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S171	2357	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile))	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S172	102	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S173	16	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey)	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09
S174	4	(transaction near5 (customer or buyer or shopper)) and ((merchant or shop or retail or store or facility or facilities or seller) near10 location) and ((POS or point-of-sale or (point near3 of near3 sale)) near8 (device or system or terminal)) and ((employee or staff) with (data or information or profile) with identity) and ((customer or buyer or shopper) with survey) and (survey with (transactional or transaction or product or (merchant or shop or retail or store or facility or facilities or seller) or (employee	US-PGPUB; USPAT; USOCR	OR	ON	2019/03/28 08:09

		or staff)))				
S175	28	(US-20100070376-$ or US-20110196754-$ or US-20030018550-$ or US-20070100728-$ or US-20100076613-$ or US-20090006151-$ or US-20070050229-$ or US-20060151598-$ or US-20020026348-$ or US-20070055597-$ or US-20030216981-$ or US-20100010906-$ or US-20110087519-$ or US-20100280881-$ or US-20120109709-$ or US-20140372184-$ or US-20160247111-$).did. or (US-8328094-$ or US-8417561-$ or US-7937286-$ or US-8027891-$ or US-8255268-$ or US-7792697-$ or US-7328169-$ or US-6039682-$ or US-6078891-$ or US-5832458-$ or US-9206481-$).did.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:35

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S33	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2014/02/20 19:22
S34	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or general$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and ((payment or pay$5) near5 (type or cash or credit or (credit near3 card)))	US-PGPUB; USPAT	OR	ON	2014/02/20 19:22
S64	223608	(G06Q$$/$$).cpc.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:53
S65	9	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54

		(credit near3 card))))				
S66	9	S64 and S65	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S67	15	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and (time near5 (transact$5 or sale)) and ((transaction or sale) with time with (amount or pric$5 or payment)) and (trend$5) and (report$5) and ((creat$5 or generat$5 or produc$5) near5 report$5) and (report$5 with (graph or graphical or graph$5)) and (report$5 with (graph or graphical or graph$5) with trend$5) and ((payment or pay$5) near5 (type or cash or credit or (credit near3 card)))	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S68	15	S64 and S67	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S69	18	(TAVARES near3 SILVIO).in.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S70	12	(FAHY near3 SUSAN).in.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:54
S71	56	(CARLSON near3 DENNIS).in.	US-PGPUB; USPAT	OR	ON	2014/02/20 23:55
S72	11	S69 and S70 and S71	US-PGPUB; USPAT	OR	ON	2014/02/20 23:56
S73	140309	("705").CLAS.	US-PGPUB; USPAT	OR	OFF	2014/02/20 23:58
S74	21889	(705/14.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/02/20 23:59
S75	17951	(705/7.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/02/20 23:59
S76	118	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2014/02/21 00:00
S77	113	S64 and S76	US-PGPUB; USPAT	OR	ON	2014/02/21 00:21
S78	25	S74 and S76	US-PGPUB; USPAT	OR	ON	2014/02/21 00:22
S79	13	S75 and S76	US-PGPUB; USPAT	OR	ON	2014/02/21 00:22

S176	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S177	385401	(G06Q$$/$$).cpc.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S178	10	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units)) and (market with trend with ((payment or pay$5) near5 (type or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S179	10	S177 and S178	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S180	33	(TAVARES near3 SILVIO).in.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S181	19	(FAHY near3 SUSAN).in.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S182	63	(CARLSON near3 DENNIS).in.	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S183	18	S180 and S181 and S182	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S184	176792	("705").CLAS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:08
S185	29517	(705/14.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:08
S186	24235	(705/7.$$).CCLS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:08
S187	162	((point adj of adj sale) or POS or point-of-sale) and (trend$4 with ((payment or pay$5) near5 (type or method or cash or credit or (credit near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S188	145	S177 and S187	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S189	28	S185 and S187	US-PGPUB; USPAT	OR	ON	2019/03/28 08:08
S190	19	S186 and S187	US-PGPUB;	OR	ON	2019/03/28 08:08

			USPAT			
S191	28	"Term Removed" or "Term Removed"	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:34
S192	26	S191 AND ((G06Q30/02 OR G06Q20/20 OR G06Q30/0201 OR G06Q30/0202 OR G06Q30/0205 OR G06Q10/06375 OR G06Q10/06395 OR G07G1/14 OR G07G1/0009 OR Y04S10/54 OR G06F16/2358 OR H04B5/0025 OR Y10S707/99933).CPC.)	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:36
S193	170230	(G06Q30/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:36
S194	85264	(G06Q20/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:36
S195	159310	(G06Q10/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S196	7225	(G07G1/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S197	37399	(Y04S10/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S198	245124	(G06F16/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:37
S199	13681	(H04B5/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:38
S200	54531	(Y10S707/$$).CPC.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:38
S201	25988	("706").CLAS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:39
S202	81959	("235").CLAS.	US-PGPUB; USPAT	OR	OFF	2019/03/28 08:39
S203	40	(((point adj of adj sale) or POS or point-of-sale) with (terminal or system or unit) with (collect$5 or record$5 or transmit$5 or send$5) with (data or ((sale or transaction) near3 information) or information)) and (((point adj of adj sale) or POS or point-of-sale) with (terminals or systems or units) with aggregat$5) and ((market or business or retail) with (trend$4 or data or information or course or direction) with ((payment or pay$5) near5 (type or method or cash or credit or ((credit or debit or debit) near3 card))))	US-PGPUB; USPAT	OR	ON	2019/03/28 08:39

3/28/2019 10:43:31 AM
C:\Users\gsingh\Documents\EAST\Workspaces\16279387 transaction specific customer survey system.wsp

ABSTRACT

Title of Dissertation: ENTREPRENEURIAL IDEA IDENTIFICATION THROUGH ONLINE SOCIAL NETWORKS

Matthew C. Lang, Doctor of Philosophy, April 2010

Dissertation Chaired by: Robert Singh, Ph.D.
Dept of Business Administration

The increasing use of social network websites may signal a change in the way the next generation of entrepreneurs identify entrepreneurial ideas. An important part of the entrepreneurship literature emphasizes how vital the use of social networks is to entrepreneurial idea identification, opportunity recognition, and ultimately new venture creation. The explosive growth of these online social networking sites provides millions with the ability to communicate more information to a larger group of people with greater frequency than existed in the past.

The focus of this study was to determine whether the use of online social networks influences the idea identification process differently than traditional "offline" social networks. Results are based on surveys collected from 282 students from nine different community colleges in the state of Maryland. The results from this dissertation show that the use of online social network websites significantly increases the number of contacts, business contacts, weak ties, and strong ties that nascent entrepreneurs communicate with. In addition, results show that nascent entrepreneurs using online social network websites not only exchange more information with their contacts, but identify more entrepreneurial ideas than their counterparts that do not use online social network websites.

The practical and theoretical implications of this research are discussed and future research directions are presented.

ENTREPRENEURIAL IDEA IDENTIFICATION THROUGH ONLINE SOCIAL NETWORKS

by

Matthew C. Lang

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

MORGAN STATE UNIVERSITY

April 2010

UMI Number:3440018

All rights reserved

INFORMATION TO ALL USERS
The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript
and there are missing pages, these will be noted. Also, if material had to be removed,
a note will indicate the deletion.



UMI 3440018
Copyright 2011 by ProQuest LLC.
All rights reserved. This edition of the work is protected against
unauthorized copying under Title 17, United States Code.



ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

ENTREPRENEURIAL IDEA IDENTIFICATION THROUGH ONLINE SOCIAL NETWORKS

by

Matthew C. Lang

has been approved

April, 2010

DISSERTATION COMMITTEE APPROVAL:

_____, Chair
Robert Singh, Ph.D.

_____
Abdul Aziz, Ph.D.

_____
David Jacobs, Ph.D.

_____
Anthony Wilson, Ph.D.

TABLE OF CONTENTS

LIST OF TABLES iv

CHAPTER 1: INTRODUCTION 1
- 1.1: The Upcoming Generation of Entrepreneurs 3
- 1.2: Online Networks and Entrepreneurs 4
- 1.3: Nascent Entrepreneurs 7
- 1.4: Motivation for this Study 10

CHAPTER 2: LITERATURE REVIEW 13
- 2.1: Opportunity Recognition 13
- 2.2: Idea Identification 18
- 2.3: Social Networks 19
- 2.4: Online Social Networks 22
- 2.5: Strong and Weak Ties 27
- 2.6: What Study the Effects of Online Social Networks 30
- 2.7: Social Capital Theory 32

CHAPTER 3: HYPOTHESES 38

CHAPTER 4: METHODS 47
- 4.1: Survey Questionnaire 47
  - 4.1.1: Survey Questionnaire Development 47
  - 4.1.2: Pilot Study 48
  - 4.1.3: Instrument Validation 49
- 4.2: Survey Sample 53
- 4.3: Survey Procedure 55
- 4.4: Data Collection 55
- 4.5: Variables Used in the Statistical Analysis 56
- 4.6: Statistical Methods Used to Test Hypotheses 63

CHAPTER 5: RESULTS AND RESEARCH FINDINGS 70
- 5.1: Descriptive Statistics 72
- 5.2: Hypotheses Test Results 80

CHAPTER 6: DISCUSSION 91
- 6.1: Limitations 102
- 6.2: Future Research 103

CHAPTER 7: FURTHER STATISTICAL ANALYSIS 107

CHAPTER 8: CONCLUSIONS 113

REFERENCES 115

APPENDICES 132
- Appendix 1 132
- Appendix 2 138

TABLES

Table 1: 6
Table 2: 48
Table 3: 49
Table 4: 51
Table 5: 56
Table 6: 64
Table 7: 70
Table 8: 71
Table 9: 72
Table 10: 72
Table 11: 73
Table 12: 73
Table 13: 74
Table 14: 74
Table 15: 75
Table 16: 75
Table 17: 75
Table 18: 76
Table 19: 76
Table 20: 77
Table 21 78
Table 22: 78
Table 23: 79
Table 24: 80
Table 25: 80
Table 26: 81
Table 27: 82
Table 28: 82
Table 29: 83
Table 30: 83
Table 31 84
Table 32: 84
Table 33: 85
Table 34 85
Table 35: 86
Table 36 86
Table 37: 87
Table 38: 88
Table 39: 88
Table 40: 89
Table 41 89
Table 42: 89
Table 43: 90
Table 44: 107
Table 45: 108
Table 46: 108
Table 47: 109
Table 48: 109
Table 49: 110
Table 50: 110
Table 51: 111
Table 52: 112

Chapter 1: Introduction

This section serves to provide background and setup for this dissertation study. A brief review of current Internet use is summarized, followed by an introduction to the upcoming generation of entrepreneurs. Online social networks are then introduced along with nascent entrepreneurs. Finally, the researcher explains his motivation for conducting this study.

Mainstream Internet adoption has fundamentally changed the way information is diffused and has eliminated the costly technical infrastructure usually needed to send or receive information to a large number of people (Gruhl, Guha, Liben-Nowell, & Tomkins, 2004). Online social networking sites continue to experience increasing membership and have had a fundamental effect on the element of communication, changing the way that many individuals socialize with one another (Davis, 2007). These sites allow individuals to share information about themselves, their friends, and their ideas in a dynamic *"one to many"* format. The author uses the term *one to many* in reference to situations where *one* individual communicates or distributes information/knowledge with *many* others simultaneously. By posting pictures, personal profiles, and intimate ideas and details in the form of blogs through online social network websites, individuals can communicate more information, more quickly, to more people, more often than at any time in the past.

MySpace, one of the first popular online social network sites, claimed membership exceeding 200 by 2007 (Kirkpatrick, 2007), which was up from a reported 60 million in September 2006 (Kowske & Southwell, 2006). By 2009, MySpace had more than 63,000,000 unique visitors in the month of November alone (ClickZ, 2010). Facebook, another popular social networking site that was originally targeted to college students, reported membership of more than 40 million in 2007. By June 2008, Facebook was receiving 132 million unique visitors each month and MySpace was getting 10 million data requests per second from its users (Howard, 2008).

Among the several million adopters of online network sites are the next generation of entrepreneurs. How might this widespread adoption and use of online networking websites change the way in which entrepreneurs generate ideas and start new ventures? As millions more

people sign-up and use these sites each year, the way communication happens and information is exchanged continues to evolve from more limited capabilities in the past.

Entrepreneurship is an activity involving the discovery, creation and exploitation of opportunities aimed at the introduction of new goods and services, new ways of organizing, or new processes (Shane & Venkataraman, 2000; Venkataraman, 1997). This next generation of entrepreneur is very likely to use online networking sites to communicate with their social networks (made up of friends, acquaintances, relatives), which may impact the opportunity recognition process.

Entrepreneurs tend to embed formation and growth activities of their business in social structures (Aldrich & Zimmer, 1986; Birley, 1985; Greve & Salaff, 2003), collecting ideas and information and then constructing them into opportunities by using social networks (Puhakka, 2006). A social network is a type of social structure which can be made-up of individuals or organizations that are tied by one or more specific types of interdependency, such as friendship, kinship, financial exchanges, conflict and trade (Barnes, 1954). This network is an information exchange that allows individuals to create and maintain a social network containing many types of person-to-person relationships, or ties. These can be strong or weak ties depending on many variables such as the frequency of contact between individuals, the duration of their relationship, and the intimacy or type of information they exchange (Harala, 2006; Haythornthwaite, 2005).

One of the benefits to studying online social networks is that individuals leave behind data on all types of interactions, producing large datasets that can be analyzed. In fact, one indication of how much new information is generated each year, driven in large part by the Internet, comes from the University of California-Berkeley. Two professors there, Peter Lyman and Hal Varian, have estimated the world creates at least five exabytes of information annually, which is enough to replicate the entire print collection of the Library of Congress 37,000 times over (Albanese, 2006, p. 32).

To further illustrate the growth opportunities associated with these sites, one need only look at recent technology acquisitions like Yahoo's takeover of Facebook and Microsoft's entry

into the social network analysis tool space with Knowledge Network. Not only are more people expected to use these sites, but the sites continue to increase their communication abilities. One example of this is the addition of SkypeCasts, which is a Voice over Internet Protocol (VoIP) product that allows up to 100 voice conference users concurrently. In short, the increasing use of social network sites may signal a change in the way the next generation of entrepreneurs identify opportunities.

1.1 The Upcoming Generation of Entrepreneurs

Each successive U.S. generation has peculiarities, nuances, and/or commonalities that tend to allow one to group them together. The 78 million Baby Boomers, born between 1946 and 1964, had post-WWII societal changes, an increase in the middle class, and an overall population increase to bind them together. The Baby Boomers were followed by 49 million members of Generation X, who were born between 1965 and 1978. Many grew up experiencing economic recession, corporate downsizing, and higher levels of unemployment. Generation X values quality of life issues, social responsibility, and experience over material possessions and display overall cautious spending and consumption patterns (Armstrong & Kotler, 2007).

Generation Y is 72 million strong and was born between 1977 and 1994. This generation has grown-up as computer technology continues to evolve and the Internet becomes more tied into everyday life. Characteristics defining this upcoming generation of workers will undoubtedly include increased globalization and use and comfort with technology. In the United States, nine out of ten homes have a computer or regular access to one, over 70 percent use the Internet daily, and cell phone usage is at 80 percent and climbing (Armstrong & Kotler, 2007). This generation has made extensive use of these technologies to communicate and maintain social networks at a level not fathomed by older generations.

While individuals of all ages use online networking sites, a majority of the users prior to mid-2006 were under the age of 25 or the Gen Y's born after 1981 (Holt, 2006). This fact is reinforced by a 2007 study which reported that 91% of teens between the ages of 12 and 17

utilized at least one social network site to socialize and keep in touch with friends, while 55% had created their own personal profiles online (O'Hanlon, 2007). Despite the overwhelming access to and use of technology to communicate, this generation may not be defined by their technology use, but by their attitudes and feelings towards sharing information. This next generation of entrepreneur is likely to use computer technology as a major communication tool and mechanism for both establishing and maintaining their social contacts.

Traditional ways of sharing information took either the form of *one-to-one* communication (written word, phone, face-to-face) or *one-to-a-few* interactions (small groups). However, with the advent of the Internet, individuals now have the ability to easily communicate on a *one-to-many* basis through email, web pages, blogging and social networking sites. Individuals under the age of 25 will be a large part of the next generation of entrepreneurs and their use of these social network sites may impact how and when they identify opportunities.

Until recently, people could access social networking services only from their desktops or laptops, but access is now much more mobile through the use of personal digital assistants (PDAs) and mobile phones. The increase in access and available collaborative tools has created the ability for individuals to create large collaborative networks like that of Bonnie Cheuk, head of knowledge and information at consultancy Environmental Resources Management.

> I think this perspective can only improve knowledge sharing to a certain extent, Cheuk says. I am focused on building up social networks to link up our 3,000 talented environmental experts based in 40 different countries. By building and nurturing social networks around business practices, business issues and clients, colleagues get to know one another, and the trust and respect make them contribute and share documents and information with one another. (*Information World Review*, 2006, p. 26)

1.2 Online Networks and Entrepreneurs

Online social networks are essentially extensions of social environments, allowing participants to interact virtually or that is, when a computer network is used to connect people, it is an online social network. These networks allow individuals to customize their profiles on web pages in order to display information such as: contact information, interests/hobbies, political views, pictures and videos of themselves and others, and links to other members of their network

and/or websites containing information on a dizzying array of topics. Visitors can leave comments and messages in a comment section, usually referred to as a *wall*. Most importantly, these online services provide several methods for linking individuals, from becoming online friends based on a direct request, referral from another friend, or a database profile search, to joining online groups and communities focused on a number of special topics and issues (Eberhardt, 2007).

The first major online social network website was SixDegrees.com, which was launched in 1997. The name of this website paid homage to psychologist Stanley Milgram's 1960's era small world experiments on social networks, which found evidence to support the principle that humans are all connected by short paths of acquaintances within the large global social network (Kleinberg, 2008). This small world principle is also known as the *six degrees of separation*, a term first used by playwright John Guare in his 1992 book of the same name.

Among Milgram's several social network findings, two were important for this research study, how information spread throughout a social network and how quickly it spread to its intended recipient. Regarding the latter, Milgram found that in order to reach an individual target, most pairs of nodes passed through 5.5 nodes within the network, spawning the concept of six degrees of separation (Howard, 2008). As for the former, he found that information spread out from person-to-person in all directions like an epidemic or in other words (Kleinberg, 2008). These two findings underscore a broader pattern of how people influence each other to change behavior over time such as adopting new technology, forming new social beliefs, and helping to do what sociologists call *diffusing innovations*, which can occur in either online or offline settings (Kleinberg, 2008; Rogers, 1995).

The recent explosive growth of online social networking can be traced back to the launch of MySpace in 2003 and Facebook in 2004, but a brief summary of social networking includes more than just these two sites.

Table 1: Summary of Social Networking

1997:	Sixdegrees.com is launched
2003:	Friendster.com is launched in March
	LinkedIn.com is launched in May
	MySpace is created in August
2004:	Google launches Orkut in January
	The original version of Facebook, called thefacebook.com, is launched by Harvard sophomore Mark Zuckerberg in February.
2005:	Bebo is launched in January
	Facebook spreads to hundreds of colleges and receives initial venture capital funding in April and expands to high schools beginning in September
	News Corp. Buys MySpace parent company Intermix Media for $580 million in July
2006:	Facebook expands past schools and into the workplace by May
	Google outbids Microsoft for the rights to MySpace search and search-related advertising in August
	Microsoft obtains ad serving rights for Facebook
	Twitter, a micro-blogging service, also goes live in August
2007:	MySpace generates a profit for the first time
2008:	By the end of this year, almost four out of five Internet users visits a social network site each month (Comscore, 2009)
2009:	Six out of seven Internet users now view online video content each month, with YouTube and Hulu experiencing rapid viewership increases (Comscore, 2009)

The Internet and its current Web 2.0 environment allows for more user-created content and information sharing, thereby allowing individuals to collaborate in different ways, influencing the type, frequency, and substance of communication (Lai & Turban, 2008). Access to tools that allow such dynamic content exchange means that the Internet continues to evolve into a more personal, democratic, user-initiated communications medium (Rheingold, 2003). For example, a list of the most popular applications used on Facebook was presented in a *Washington Post* article (Hart, 2008) and the top two, with 2.5 and 2.4 million active users respectively, were applications that supported a user in sending comments and videos or sharing videos with other users.

In December 2008, Facebook introduced Facebook Connect which not only allows one to sign-on to any website using their Facebook identity, but allows them to interact with their friends no matter what website they are visiting. For example, a user of Facebook Connect could have a friend visiting a news website and not only observe what they were reading and how they rated it, but review any comments they left behind. Nascent entrepreneurs could leverage this

information to gain insight into growing trends, common user complaints/needs, and ultimately, identify opportunities.

This is potentially very important to entrepreneurs, since they tend to embed their business decisions in social structures and the link between entrepreneurs and their use of social network has been widely researched (Borch, 1994; Greve & Salaff, 2003; Hansen, 1995; Larson & Starr, 1993; Reynolds, 1991; Singh, 2000; Starr & MacMillan, 1990). They also tend to have well established social networks, using them to obtain and generate business ideas (Brown & Butler, 1995) and to get advice and resources to launch a business (Granovetter, 1985, 1992). In addition, Greve and Salaff (2003) found that entrepreneurs access their social relations, contacts, and resources in similar ways across cultures.

The link between traditional social networks and online social networks continues to evolve. Jeff Hammerbacher, a Facebook research scientist, continues to study the habits of online users and has observed that individuals are more likely to become active users when entering a dense, active network (Howard, 2008 p. 16).

1.3 Nascent Entrepreneurs

The literature and our knowledge of individuals at the very earliest stages of entrepreneurial activity continue to evolve. New business creation accounts for nearly one third of the economic growth variance in many industrialized countries (Davidsson, Lindmark, & Olofsson, 1994; Reynolds, 1994; Reynolds, Hay, Bygrave, Camp, & Autio, 2000; Reynolds & Maki, 1990). Entrepreneurs are a centerpiece to this new business creation, but what motivates them to begin a new business or more importantly, what makes these individuals into entrepreneurs in the first place? Tornikoski and Newbert (2007) define nascent entrepreneurs simply as would-be entrepreneurs. The reasons they give for starting new businesses are similar to those reasons given by non-entrepreneurs for seeking a new job. These reasons range from a need for innovation and freedom to a desire for financial success and recognition from one's peers (Carter, Gartner, Shaver & Gatewood, 2003).

Reynolds and White (1997) agreed, arguing that how individuals create new firms is not understood. Research on organizational emergence, a process describing how firms become operational, is underdeveloped due primarily to conceptual and methodological complexity of organizations, but also because no organization exists prior to its founding, meaning that the attributes used to study and describe organizations at this stage often do not exist (Delacroix & Carroll, 1983). In addition, the actions and activities of nascent entrepreneurs can also be confusing to researchers.

Reynolds (1994), and Reynolds and White (1997), found that although nascent entrepreneurs do engage in one or more of a defined set of 17 different activities prior to official business formation such as seeking financial support, looking for equipment, and looking for facilities, they tend not to initiate these activities in any particular order (Carter, Gartner, & Reynolds, 1996) nor in any set combinations, and in fact, they may engage in some of these activities before any serious thought is given to initiating a new venture. For the reasons cited, it is argued that proper and accurate measure of founding conditions is a primary challenge for conducting empirical research on new ventures (Bamford, Dean, & McDougall, 2000) and by extension, nascent entrepreneurs.

Research has supported the notion that a nascent entrepreneur's work experience, industry experience, and their level of education (including the taking of business courses) were correlated with the survival chances and profitability of their new firms (Bruderl, Preisendorfer, & Ziegler 1992; Jo & Lee, 1996; Sapienza & Grimm, 1997). Research from Tornikoski and Newbert (2007) found that what nascent entrepreneurs "do" is more important than "whom" they are or what markets they intend to enter and that their efforts had more impact on the eventual acceptance of their organizations than their background or industry experience. Cooper Gimeno-Gascon, and Woo (1994) found that a nascent entrepreneur's social capital and industry-specific know-how were positively related to employment growth in newly founded ventures.

As nascent entrepreneurs work through the discovery process they make extensive use of their network of friends and acquaintances or social capital. This social capital helps to expose

them to varying ideas and views, providing a wider frame of reference and support for new business ideas (Aldrich, Renzulli, & Langton, 1998; Aldrich & Zimmer, 1986). Davidsson and Honig (2003) found that social capital can be an important predictor of who will choose to become a nascent entrepreneur and the overall pace of the nascent entrepreneurial process. More importantly, their findings suggest that actively pursuing, developing, and maintain social relations is a more important predictor of success than taking business classes. Davidsson and Honig (2003) go on to suggest that advances in communication technologies will enable entrepreneurs to better develop and promote their network capabilities.

Aldrich and Martinez (2001, p. 45) believe that "in order to transform an idea into an organization, a nascent entrepreneur requires resources." Zimmerman and Zeitz (2002) argue that others are motivated to provide these resources based on their perception of the nascent entrepreneur's competency, effectiveness, worthiness, or need. This view is shared by Aldrich (1999) in that the perception of legitimacy of the new organization and the activities of the nascent entrepreneur are important for acceptance by those that may engage in activities with the nascent entrepreneur. Even venture capitalists commonly analyze various characteristics of the nascent entrepreneur when making investment decisions (Macmillan, Siegel, & Subbanarasimha, 1985).

Although the research sample will include nascent entrepreneurs of all ages, a primary age group studied will be between the ages of 18–25. The ages of 18–25 are often called a phase of emerging adulthood, which is a formative period between adolescence and adulthood (Arnett, 2000). Arnett argues that this is a critical stage of development because this is when one develops long-term social skills that are critical for self-dependence and relationship maintenance. By providing tools that allow for a new way to maintain and develop new relationships, these online social networks may provide the information and ideas necessary for venture development.

1.4 Motivation for this Study

If social networks, a solid knowledge base, and a firm commitment to remaining alert are primary antecedent elements important to entrepreneurial creation (Ko & Butler, 2006), then perhaps use of online social networks, with their instantaneous access to multiple information sources and ability to facilitate collaboration of information and ideas, could increase entrepreneurial activity, especially in the form of opportunity recognition. Based on Shane's (2003) idea that access to and attainment of appropriate information plays a crucial function in opportunity recognition (Gaglio & Katz, 2001, Kaish & Gilad, 1991) one could postulate that the unique capabilities inherent to online social network sites would enhance an entrepreneur's ability for opportunity recognition or at the very least, increase the number of possible opportunities that they would be exposed to.

The current body of research helps to explain how each person's individual makeup is related to his or her ability to identify and exploit an entrepreneurial opportunity. However, there is a gap when it comes to the potential impact of online social networks in opportunity recognition. The antecedent elements of entrepreneurship including the connection between entrepreneurship and social networks, has been researched, but the impact of online social networks on this link has not. The current proliferation and use of online social network sites by the next generation of entrepreneurs, those out of high school, could drastically affect all three antecedent elements of entrepreneurial new venture creation.

Constructing an initial resource base in a new venture requires that resources be identified, assembled, and acquired to meet a perceived opportunity before they are allocated to fit a product and market strategy (Brush, Greene, & Hart, 2001). Online social networks support ongoing communication with one's current contacts and facilitate the creation of new contacts through referrals (friends of friends), participation in online gaming sites, and online activities (e.g. blogging, discussion boards, and mutual interests/hobbies). Through online mechanisms such as these, nascent entrepreneurs can develop a rather extensive network of contacts within a short period of time. Through use of automated tools and posting of materials on one's personal web

page, nascent entrepreneurs can maintain ongoing communication with these contacts as frequently as desired.

Grossman (2005) found that at the earliest stages of new venture creation, many entrepreneurs value network connections more than the resources that might be secured via those contacts. The immediate access to so many individuals through use of online social networks may impact how these networks are accessed, the way in which ideas and knowledge are exchanged within a network, the methods of communication, and the frequency of idea exposure and ultimately, the number of opportunities that a nascent entrepreneur may be exposed to.

By adopting a Kirznerian view of opportunity recognition, that entrepreneurial opportunity recognition arises from an individual's differential access to information (Kirzner, 1973), this paper will explore if the use of online social networks provides enough differentiation access to information to increase the number of opportunities one may be exposed to. Shane (2000) found that by recognizing the value of new information they are exposed to, entrepreneurs can discover new opportunities. Arenius and de Clercq (2005) continued with this argument, finding that an important reason why some individuals perceive entrepreneurial opportunities through exposure to new information resulted from the different structures of their embedded network.

Ultimately, online social network use may challenge traditional understanding of how resources are accessed during the entrepreneurial process. Due to the dynamic nature of online networks, nascent entrepreneurs can quickly add to their knowledge and experience base. Factors to be considered include how often a nascent entrepreneur makes use of their social network, timeliness of opportunity recognition, and the number or "quantity" of ideas exposed to. The purpose of this study is to determine how nascent entrepreneurs use and anticipate using these online social networks in identifying entrepreneurial ideas.

A thorough literature review is conducted in Section 2.0. This review will concentrate first on opportunity recognition, providing a brief summary of the process and more importantly, how an entrepreneur's social network plays a part in the process. Next, a review of the social network

literature and primarily its focus on traditional social relations and communication methods is conducted. Finally, a review of the literature surrounding online social networks and how social capital theory may help to explain the role of social computing is provided. Based on the literature review and current gaps in our understanding of how online social networks may benefit nascent entrepreneurs, 13 hypotheses are developed and presented in Section 3.0.

Two separate nascent entrepreneurial populations will be surveyed for this study and the methods used for their study are contained Section 4.0. The first population is the target of much of the nascent entrepreneurial research, undergraduate students. This is both a convenient population to sample and historically is a breeding ground for many future entrepreneurs. The second population studied is intended to capture a broader age range of adults with a variety of interests and backgrounds, those taking continuing education classes at Maryland community colleges.

More specifically, adults taking classes that are likely to contain nascent entrepreneurs, such as *How to Start Your Own Business, Opening a Food Service Busines, and Negotiating and Handling Objections to Sales*. The author of this study believes that as a percentage of the total population, more of these students are likely to start their own business than the undergraduate population, but no statistical evidence of this could be found for this study.

Although the purpose of this study is not to compare and contrast these two nascent entrepreneurial groups, it was expected that the inclusion of both student populations would provide a more diverse and rich data collection than previous nascent entrepreneurial studies. Study results are presented in Section 5.0 and further discussion of those results, along with suggestions for future studies, are presented in Section 6.0. Supplemental analysis is contained in Section 7.0, with final study Conclusions located in Section 8.0.

Chapter 2: Literature Review

This section reviews aspects of the literature relevant to this study. It starts by reviewing key aspects of opportunity recognition and then does the same for idea identification. Social networks are then explored, which leads into a review of relevant online social network research. The connections between various types of contacts are then explored in a review of strong, weak, absent and latent ties. Finally, the relevance of social capital theory to online social networks is explored.

Entrepreneurship is the process by which "opportunities bring into existence future goods and services which are discovered, created, and exploited (Venkataraman 1997, p. 120)." Research indicates that humans acquire a large amount of important information from other people and this important information can be conveyed by family relations, close friends, and acquaintances alike (Shane & Cable, 2002). Networks are one way in which entrepreneurs can reduce transaction costs, reduce risks, improve learning, and increase their information-sharing possibilities (Kristiansen, 2004). This literature review will focus on the opportunity recognition and social network research to date and then provide a review of the relevant online social network research.

2.1 Opportunity Recognition

The opportunity recognition process is a vital part of the entrepreneurial process (Shane & Venkataraman, 2000; Singh, 2000). Entrepreneurship is a choice available to any individual and opportunity recognition is the key to unlocking the possibilities of a new venture (Lee & Venkataraman, 2006). An increasing number of studies have focused on the opportunity recognition process (Gaglio & Katz, 2001) and some have even proposed that entrepreneurship scholars should focus solely on studying opportunity recognition processes (Davidsson, 2003).

Researchers have made several attempts to develop conceptual models of the opportunity recognition process (Bhave, 1994; Christensen, Madsen, & Peterson, 1994; Gaglio & Taub, 1992; Singh, 2000), but these attempts tend to fall when it comes to explaining why entrepreneurs

choose one opportunity over another and in providing information about the types of opportunities recognized. Despite these failings, research has identified critical steps in the opportunity recognition process, usually describing it as linear in nature (Gaglio & Taub, 1992). Gaglio and Taub (1992) believe that opportunity recognition is based on a variety of factors like personal attributes, technology, social influences, and market needs and that the process can be summarized in four steps; (1) the Pre-recognition Stew, (2) the Eureka Experience, (3) the Development of the idea, and (4) the Decision to Proceed.

There is recognition that at least some of the opportunity recognition process is under the control of the entrepreneur. Long and McMullan (1984) argue that for an opportunity to come to fruition, a significant amount of preparation is required, preparation that personalizes the opportunity, making it inaccessible to many others. A variety of factors come together, including those that are controlled (such as job selection, lifestyle, and alertness) and uncontrolled (such as social influences, economic forces, culture, and personality) to influence the ability of the entrepreneur to not only recognize an opportunity, but to better evaluate and maximize the profit potential of it (Long & McMullan, 1984).

This coincides with earlier research from Cyert and March (1963) where they divided opportunity recognition into externally and internally stimulated categories. Externally stimulated opportunities are ones in which entrepreneurs conduct an ongoing search and filtering before founding, while internally stimulated opportunities describe situations where entrepreneurs discover unmet needs and problems to solve and then later decide to proceed with venture creation (Bhave, 1994; Cyert & March, 1963).

While viewing opportunity recognition as a linear process is well researched, some believe that the process may be more iterative in nature, requiring refinement before the business concept can be identified. For example, one model assumes that multiple opportunities need to be considered through an entrepreneurial "simmering" process before selecting a course of action (Bhave, 1994). Bhave's (1994) model assumes that externally stimulated opportunities are developed and refined through number of iterations, meaning that the time needed to determine

the "right" opportunity is not a constant and may differ based on the type of opportunity, the environment, and the unique make-up of the entrepreneur.

Others believe that the process of opportunity recognition has five sub-processes (Puhaka, 2006). Puhaka (2006) identified them as knowledge recognition, competitive scanning, proactive searching, innovative behavior, and collective action. Knowledge recognition brings together information useful for the proposed business, helps to translate this knowledge for business use, and can include information about technology, products, customer, the industry, regulatory requirements, finance, and so forth. Competitive scanning involves actively scanning the competitive landscape and leveraging this knowledge to develop a competitive strategy to take advantage of opportunities.

Proactive searching is the third sub-process and this behavior helps the entrepreneur to better understand future trends, which are understood through the competitive scanning sub-process. In order to develop this competitive strategy, an entrepreneur must engage in the fourth sub-process, innovative behavior. This leads to questioning the current methods of doing business and determining which ideas can best be acted upon, collective action. More specifically, this is a social behavior based collective action which enables the entrepreneur to make steps toward achieving their future vision (Puhakka, 2006).

Possessing personal knowledge of an industry may allow an entrepreneur to better recognize market gaps which can lead to new ventures (Singh, 2000; Vesper, 1996). In fact, multiple studies have shown between 40% and 70% of entrepreneurs get their new venture idea while working in the same industry (Case, 1989, Cooper, Dunkelberg, Woo, & Dennis, 1990; Singh, 2000; Woo, & Dennis, 1990). In addition to specific industry experience, it is possible that social interactions within the industry, such as discussions with industry contacts and business colleagues, could lead to opportunities (Burt, 1992; Johannisson, 1990; Singh, 2000).

Research has shown that people possess different information, experience, and beliefs, and therefore, some individuals recognize opportunities that others either cannot see or before they see them (Shane, 2000). Therefore it can be argued that idiosyncrasies of information and

beliefs are necessary for opportunities to exist (Kirzner, 1973). Research also supports the hypothesis that creativity, cognition, and opportunity identification processes are correlated (Lumpkin, Hills, & Shrader, 2004; Ward, 2004), that recognition abilities differ because each person has different pieces of the world's totality of information (Hayek, 1945), and that we each rely on different cognitive mechanisms (Baron, 1998; Busenitz & Barney, 1997).

Taken together, this provides an understanding of what attributes (prior knowledge, cognitive mechanisms, heuristics, or creative abilities) nascent entrepreneurs need. It also provides insight into the amount of information and action required to comprehend and anticipate the risks and returns of entrepreneurial opportunities. Reynolds (1994) estimates that nearly 4% of working age adults in the U.S. are in the process of starting a business at any one time. In fact, the mere act of searching for activities using traditional methods can take several years (Reynolds & Miller, 1992; Singh, 2000). It is important to note that the term *traditional methods*, as used in this study, refers to opportunity recognition processes and more specifically social network processes, which do not employ or account for the use of online social networks or computer-based networking.

Opportunities tend to arise out of environmental changes that occur where an entrepreneur operates and these opportunities tend to be of three types: technological, political and regulatory, and/or social and demographic (Schumpeter, 1934). Exploitable opportunities are discovered in a number of ways. Shane (2003) focused on the individual-opportunity nexus as it relates to one's special cognitive skills (Baron, 2004; Shane & Venkataraman, 2000), while Arenius and de Clercq (2005) studied networking skills. In addition, organizational learning processes (Lumpkin & Lichtenstein, 2005) and career choices (Lee & Venkataraman, 2006) have also been studied as mechanisms that help to set the stage for entrepreneurial opportunity recognition. Together, these are central to the incubation, evaluation, recognition, discovery and formation of entrepreneurial opportunities. Despite increased research emphasis on the topic, knowledge about the opportunity recognition process is still considered to be in its infancy (Ardichvili & Cardozo, 2000).

Some believe that entrepreneurial activity depends on the interaction between opportunity characteristics and the characteristics of those that exploit them (Shane, 2003). Shane (2003) identified the individual-opportunity nexus as a framework where opportunities are independent of those that perceive them. This follows from the previous belief that opportunities are objective and the perception of opportunity is subjective (Hayek, 1937).

Social constructionists believe that opportunity formation is created relationally and communally (Fletcher, 2006). Fletcher (2006) believes that opportunity recognition frameworks are limited in their ability to explain why people act on opportunities the way they do in relation to broader societal processes for three reasons: (1) the belief that opportunities are there waiting to be discovered by alert individuals; (2) too much is attributed to individuals making insightful judgments about where the opportunity gaps are and which ones to select based on their market knowledge and skills; and (3) little attention is given to the wider cultural and societal structures that shape entrepreneurial practices.

Sometimes identifying meaningful patterns or trends within a complex array of events, called pattern recognition, can be an important component of recognizing new business opportunities (Baron & Ensley, 2006). Baron and Ensley (2006) argued that experience plays an important role in this process by providing a basis through which the entrepreneur can "connect the dots" between seemingly unrelated events. They tested this by comparing the business opportunity prototypes of first-time and experienced entrepreneurs and found support for their belief. The business opportunity prototypes of experienced entrepreneurs were more clearly defined and richer in content than those of novice entrepreneurs; thereby supporting the view that pattern recognition is a key component of opportunity recognition (Baron & Ensley, 2006). Said another way, if an experienced entrepreneur and a nascent entrepreneur were placed in identical situations where multiple opportunities were present, the experienced entrepreneur should identify more of these opportunities, or at least the better ones.

The lack of attention to societal structures also includes the influence of online social networks on opportunity recognition. Although a relatively new phenomenon, online social

networks of nascent entrepreneurs can enable them to develop and foster relations with more individuals, more quickly, allowing them to share and be exposed to more information and ideas than they otherwise could be aware of, or exploit. According to Shane (2003) an individual may recognize an opportunity before others because they have better information and/or they are able to put the information to better use. He identifies three primary ways of getting better information: through life experiences, social networks, and search processes (Casson, 2005). Shane (2003), identified the linkage of entrepreneurship and social networks as an area in need of more study, especially in gaining a better understanding of how entrepreneurs use social networks to gather information and then leverage those networks.

2.2 Idea Identification

Human creativity is an important aspect of entrepreneurial behavior and is linked with identification of opportunities (Ko & Butler, 2007). This aspect of creativity is what differentiates one entrepreneur from another and helps to explain why entrepreneurs can identify different opportunities from the same stimuli (Shane, 2000). Although research has supported the notion that creativity and opportunity identification are correlated (Lumpkin, Hills, & Shrader, 2004; Ward, 2004), entrepreneurial creativity is still not fully understood. For example, the individual processes associated with creativity, especially those associated with how information gained through social networks, prior knowledge, and alertness are combined, is still not well-understood (Ko & Butler, 2007).

Idea identification is part of the opportunity recognition process. Puhakka (2006) segmented the opportunity recognition process into five sub-processes, with idea identification happening in the fourth of those sub-processes, innovative behavior. Social networks are an important part of the idea identification process and the use of a well-developed social network is an important source for business ideas (Brown & Butler, 1995). This coincides with other research showing that individuals can identify opportunities through the combination of information processing, searching techniques, and scanning behavior (Shaver & Scott, 1991). In

fact, networks have been associated with how many new opportunities an entrepreneur perceives (Singh, 2000, Singh, Hills, Hybels, & Lumpkin, 1999) and depending on which networks they are embedded in, different individuals may be more likely to recognize ideas and opportunities (Arenius & de Clercq, 2005).

In addition to ones social network, prior experience can play an important part recognizing ideas (Shane, 2000). When prior experience is combined with ongoing scanning for information and alertness, it can be effective at idea generation (Ko & Butler, 2007). While social networks, a solid knowledge base, and a firm commitment to remaining alert to opportunities are all necessary components of noticing an opportunity, they do not ensure or guarantee that it will happen. Many of us see the same set of facts under the same set of conditions, yet do not link them in a way that leads to a new product or business.

Previous research suggests that differences in knowledge and experience can influence the way information is processed and can impact opportunity identification (Shane, 2000). The network literature suggests that one gains access to ideas and information through interaction with others, who have access to other individuals, and these various interactions make-up one s network, a network with characteristics that influence the availability, quality, and timing informational access (Arenius & de Clercq, 2005). This research does not discount the fact that nascent entrepreneurs can recognize ideas and in fact, it may even point to the benefits of online social networks in helping nascent entrepreneur's identify ideas. The larger numbers of social network members, greater frequency of communication with those members, and the availability of pattern recognition software at these sites may combine to increase a nascent entrepreneur's ability to identify patterns needed for increasing their likelihood of recognizing ideas.

2.3 Social Networks

While online networks are of recent origin, social networks extend back to the beginning of human civilization. The mechanisms involved in social networks have been studied throughout the social sciences, playing a fundamental role in the spreading of ideas, information, and

influence (Kempe, Kleinberg, & Tardos, 2003). One example of this is with diffusion of innovations. This area of study analyzes how the success or failure of innovations spread from early adopters through personal and professional networks and has been studied widely in: (1) sociology; (2) mathematics, where formal models of it have been developed by mathematical economists; and (3) computer science, where researchers have been attracted to the large amount of online data available surrounding the topic of diffusion of innovations (Piatetsky, 2007).

The combination of networks and social capital help to create favorable conditions for information exchange and the creation of new knowledge (Nahapiet & Ghoshal, 1998). It has been argued that an entrepreneur's social network is their most important source of knowledge (Johannisson, 1990) and new ideas (Christensen & Peterson, 1990). The differences in network characteristics may help to explain the extent of knowledge transfer (Burt, 1992; Coleman, 1988; Davidsson & Honig, 2003) and provide the opportunity for new knowledge generation based on the argument that these existing networks represent differing knowledge bases (Lawson & Lorenz, 1999).

In social network theory, social relationships tend to be viewed in terms of *nodes* and *ties* and the social network is like a map that conveys all relevant ties between nodes. People or other social entities are represented by the *nodes*, and the links between the nodes, which indicate some type of relationship between the actors, are the *ties*. The social network research tends to emphasize both the social and work interactions between people, but does not focus much on individual actions (Wasserman & Faust, 1994; Wellman & Berkowitz, 1997). However individual actions may be a key determinant to entrepreneurial activity with online social networks, making this an important area to explore. Davidsson and Honig (2003) suggest that entrepreneurs should focus attention on developing and promoting all sorts of networks. For example, their network ties are extremely important in acquiring initial investment funds (Batjargal & Liu, 2004; Shane & Cable, 2002; Starr & MacMillan, 1990) since entrepreneurs tend to approach two types of prospective investors, those with whom they have a prior relationship or those they are referred to.

Social network theory attempts to explain variations in beliefs, behaviors and attitudes based on the social structures among actors, groups, and organizations (Hatala, 2006). Research within the social network realm has covered topics of social capital (Coleman, 1988) social support (Lin, Woelfel, & Light, 1986), social influence (Friedkin, 1986), and collaboration (Joshi, Labianca, & Caligiuri, 2002). However, the most recognized published work within social network theory may be Granoveter's (1973) discussion of the *strength of weak ties* as it described how individuals differ in the way they interact and share information with people that they had different types of relationships with. These characteristics define whether it is a strong or weak tie within the social network, which will be discussed further in Section 2.5.

Transaction logic can change from economic behavior to a social relationship through direct social ties (Marsden 1981, Uzzi, 1996). These direct social ties can transfer behavior expectations from a prior social setting to the new business transaction (Uzzi, 1996). This is important because social relationships are governed by norms of fairness and equity instead of self-interest (Granovetter, 1985). By embedding transactions in social relationships, direct ties (a) generate a sense of obligation between the parties, (b) motivate both parties to maintain a fair and trusting relationship, and (c) cause the parties to behave generously towards one another (Gulati, 1995). Since direct ties provide a fast mechanism for obtaining intimate information about the quality of people's talents and their tendency to behave opportunistically, they may also be able to enhance resource acquisition (Aldrich & Zimmer, 1986; Gulati & Gargiulo, 2000; Uzzi, 1996). Online social networks may help to form more direct tie relationships. Puhakka (2006) argues that by creating social relationships, entrepreneurs can identify important information, submit their ideas, and obtain feedback of their ideas through their social networks.

Aldrich and Zimmer (1986) were among the first to suggest that social networks might be a distinguishing factor that helps to explain entrepreneurial behavior. Koller (1988) found that successful entrepreneurs used business associates, relatives, and other social contacts to generate ideas. The notion that less proximate social contacts may be better sources of information was also confirmed in a study by Kaish and Gilad (1991). Research by Singh (2000)

that was later supported by Ko and Butler (2007) suggests that social networks are also important in the opportunity identification stage and increase the likelihood of entrepreneurial creativity.

Arenius and de Clercq (2005) argued that an entrepreneur's human capital is an important mechanism through which access to network contacts can be obtained, meaning that access to one's network contacts can impact opportunity recognition. Could these network contact benefits be enhanced through the use of online social networks? Online social networks, which allow quick, easy, and rich media information exchange with network contacts, could positively impact opportunity recognition of nascent entrepreneurs.

2.4 Online Social Networks

Online social networks have had a major impact on Internet usage, human social behavior, and overall communication. Content is king on the Internet and in the past, content creation was controlled by the owner of each website, much like print media has been. However, since about 2004, the expansion of broadband Internet access and increase in online social network use has shifted the locus of control in the creation, control, and distribution of content to the individual user (Parameswaran & Whinston, 2007). As early as the 1990s, Thomsen, Straubhaar, and Bolyard (1998) argued that online communities reflected human relations, mimicking the changing nature of human interaction.

Not only is content creation more decentralized, but the online communities themselves are as well, which can impact human social behavior. Powell (2005) found that most network communities emerge spontaneously, are decentralized, and support freedom of expression and anonymity. Social instincts and communal benefit may be more important than performance in the context of online communities. A significant amount of innovation happens in them, innovation often created by users that have little intellectual property rights protection (Parameswaran & Whinston, 2007). In other words, this sort of belief system and community not only supports, but encourages idea and information sharing. In turn, the constant flow of new

information and ideas should benefit the opportunity recognition process for nascent entrepreneurs.

Online social network sites can facilitate an online community of users, but these sites are not defined by the community created. Boyd and Ellison (2007) defined online social network sites as "web-based services that allow individuals to create a profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system (p. 211)." Coyle and Vaughn (2008) suggested that online social network sites "encourage communication with others by providing directories of relevant user populations, opportunities for self-description and content uploads, and/or recommender systems (p. 13)." Said another way, online social networks provide a foundation, through use of collaborative tools, for communication between individuals using the Internet.

Social network sites can be viewed as tools for finding information and getting questions answered, allowing you to access the knowledge by people you know (Piatetsky, 2007). Some argue that social network structure is latent, invisible, and at some level unknowable, but sites like Facebook cannot only graphically depict an individual's social network, but show specific connections and clustering of nodes (Piatetsky, 2007). How might this impact nascent entrepreneurs in their quest for new ideas and opportunities?

One of the unique aspects of social network sites is their ability to enable users to articulate and make visible their social networks (Boyd & Ellison, 2007), meaning that users cannot only see a graphic representation of their social network, but gain better understanding of how the various nodes within the network are related. The consequences of this capability could be far reaching. Wellman, Salaff, Dimitrova, Garton, Gulia, and Haythornthwaite (1996) asserted that online computer networks are social networks with strong, intermediate, and weak ties between members. With the graphical representations now available, nascent entrepreneurs using social networks may be able to make better strategic use of the network contacts available since they can better understand how they relate to one another.

It has been argued by anthropologist Robin Dunbar that an individual can sustain about 150 social relationships and that even though online social networks have millions of users, individuals will tend to keep this 150 relationship threshold in mind (Howard, 2008). However, the tools provided by online networks allow more frequent contact and information exchange with those 150 individuals than could take place using traditional methods. These online networks of individuals allow for multiple types of information exchange. They facilitate *one-to-many* exchanges through the posting of information like personal profiles, pictures, music, or a blog that others can access concurrently. They can also facilitate *one-to-one* and *one-to-a-few* exchanges through text messaging and restricted access levels of security, attempting to limit who can access and view certain things.

The concept of information sharing online is increasing rapidly as delivery tools and the time between message receipt and response shrinks. Online social networks demonstrate an ability to converge around the objectivity of content and as the reputation of a particular social site grows, community-generated content quality improves, perhaps due to an increase in high-value participation and refinement (Parameswaran & Whinston, 2007). Instant messaging, file sharing, blogs, podcasts, and online social network sites are examples of this.

The popularity of Web logs, or blogs, started gaining steam in 2000. Blogs are interactive exchanges of thought and expression between writer and reader, providing the ability for anyone to create their own online community. Podcasts are essentially a method for distributing audio blogs. File sharing allows one to distribute pre-produced media such as movies, music, podcasts, electronic books, and so forth and demonstrates the power of network collaboration by allowing individuals to share both content and resources (Weiss, 2005).

Liben-Nowell, Novak, Kumar, Raghavan, and Tomkins (2005) developed a model for testing the small world model and found that online social networks arrange themselves optimally for forwarding information and messages over long distances. Other experiments have supported this finding and found that distance cannot only be geographic, but also socio-

economic, or hierarchical within an organization (Kleinberg, 2001, 2008; Watts, Dodds, & Newman 2002).

Online networks provide everything from privacy settings to filter settings to allow one to limit the type and amount of information conveyed to others. In addition, online sites allow one to edit information seen from other contacts, such as Facebook's News Feed that shows what one's friends are doing and posting on their sites, which reduces the effort needed to investigate each of these social contact sites individually. Online sites can also facilitate off-line communication. Haythornthwaite (2005) found that although networking was not necessarily the goal, use of social network sites resulted in connections with individuals that would not otherwise have been made and that sometimes, these "latent ties" would also connect offline.

Studies of electronic collaboration suggest that online virtual communities share many characteristics with face-to-face communities and that these Internet-based relationships become quickly assimilated into daily life (Carter, 2005). Although Haythornthwaite (2001) discussed the social consequences of Internet use, most of the current research focuses on specific components of virtual communities (Hersberger, Murray, & Rioux, 2007). Graham and Hazel (2004) found that the role of virtual community membership was critical in determining the amount of knowledge capital generated by an online group while Burnett (2002) analyzed the writing, reading and interpretation of texts that are critical components of transforming groups into communities. Chan, Teo, Wei, and Zhang (2003) found that information must be accessible and easily communicated within a virtual community in order to sustain them.

Recent studies of these large online datasets are providing much insight into the particulars of online social networks. One such insight is the knowledge gained around the principle of preferential attachment. Preferential attachment is the idea that future gains accrue more often to network nodes with more connections, or said another way, new users to an online social network will connect more often with well-connected members – creating highly connected hubs around certain individuals within a network (Kleinberg, 2008). Another preferential attachment study of four different social network sites found that the number of member

connections falls off exponentially with more degrees of separation and especially after two nodes (Howard, 2008).

Howard (2008) identified some important work involving Yahoo! researchers who found that the interconnections per person on each site (network density) followed similar patterns, with rapid growth through early adopters, a smoothing out as fewer new friendships develop, and then slow and steady growth of both members and connections. In addition, these researchers segmented online networks into three groups: one group made-up of individuals that do not participate much, a large core of users that connect often, and a middle group of members that belong to isolated communities that keep to themselves and display a star structure where typically one charismatic individual is linked to others that have few connections outside the star.

Research on how new connections are formed online found support for a key principle in sociology, called *triadic closure*, which postulates that links are more likely to form between two individuals when they have a common friend (Kleinberg, 2008; Kossinets, 2006; Rapoport, 1953). Kleinberg (2008) cites a few additional findings concerning online social networks, including the *densification effect* and *shrinking diameters*. The densification effect describes when the number of links per individual increases as the network grows larger and "shrinking diameters" explains how the number of connection steps between nodes can actually decrease despite an increase in the total number of network nodes (Kleinberg, 2008; Leskovec, 2005).

How might the use of online social networks affect previous findings about an entrepreneur's network? One's network is made-up of interaction with others, who each have access to additional individuals, and these various interactions influence the availability, quality, and timing informational access (Arenius & de Clercq, 2005). In other words, the nature of one's network can affect the flow of information and ultimately its benefit to the entrepreneur. On the surface, it appears that the use of online social networks would not drastically differ from these findings, however what about the cohesiveness of an individuals' network, especially the impact on their weak ties?

Ellison, Steinfield, and Lampe (2007) found that online networks tend to be larger than traditional offline networks and that the Internet helps to sustain one's social network. Two recent surveys of undergraduate students reinforce this point. Coyle and Vaughn (2007) found that 41% of their survey respondents used social network sites to "keep in touch with friends" and Ellison (2007) found that undergraduates used Facebook to stay in touch with people that they used to be more closely involved with. In fact, Coyle and Vaughn (2007) found that most undergraduates have at least two different social network accounts and that they log onto them an average of about three times daily.

Bridging social capital is related to one's ability to maintain and develop weak ties and online social networks may influence this differently than traditional social networks. For example, it was found that bridging social capital has a relationship with self-esteem and that use of an online social network interacts with self-esteem to influence bridging social capital (Steinfield, Ellison, & Lampe, 2008). Ellison et al. (2007) found a strong association between the three types of social capital and the use of Facebook, but the strongest association was with bridging social capital. Online social networks like Facebook allow one to transfer friends from offline social networks to those online while allowing easy contact with a large array of acquaintances (Steinfield et al., 2008; Subrahmanyam, Reich, Waechter, & Espinoza, 2008). The ability to broadcast information about social "happenings" and one's ongoing activities through a variety of media (pictures, video, blogs) while simultaneously monitoring the activities of others creates a solid infrastructure for social interaction that cannot be matched in offline networks (Steinfield et al., 2008).

2.5 Strong and Weak Ties

Granovetter's (1973) famous work identified and distinguished the difference between the various types of interpersonal relations, categorizing them into one of three types: *strong ties*, *weak ties*, or *absent ties*. The strength of a tie is the combination of the amount of time, emotion,

intimacy, and level of reciprocity existing between individuals within an interpersonal network (Granovetter, 1973).

There are two levels of analysis when describing a *strong* or *weak* tie – a *relational* meaning at the communication level and a *structural* meaning at the population level (Centola & Macy, 2007). The relational refers to the tie's strength as an informational conduit (with weak ties interacting less frequently than strong ties and therefore possessing less influence) and structural meaning refers to the ability of a tie to facilitate cohesion and integration across a social network by linking individuals who would otherwise not be connected (Centola & Macy (2007).

Granovetter found that although weak ties were weak in a relational sense, they were strong in a structural sense because they provided shortcuts across a social network. Granovetter defined weak ties as loose relationships among individuals and argued that they are important in helping one obtain information and resources that they would otherwise have difficulty locating (Granovetter, 1973). Ganovetter (1973) advocated maintaining an extensive network of weak ties in order to better obtain difficult-to-obtain resources. A major strength of a weak tie is that they tend to be *long*, connecting help to extending and connecting one's network by linking individuals in socially distant locations through interface exchanges. Information tends to be diffused through these weak tie interface exchanges, with the weak tie serving as a short cut between remote social clusters or in other words, the weak tie serves as a *long tie* (Watts & Strogatz, 1998).

Since acquaintances know people that a given individual does not, a majority of the novel information within a network is transmitted through these weak (and long) tie exchanges (Granovetter, 2004). Only a few weak/long ties are required to facilitate *degrees of separation* (which are characteristic of random networks), enabling information to spread very quickly among various social communities (Watts & Strogatz, 1998). It is assumed that these information transmissions are simple and not complex, meaning that the social contact necessary for transmission is not costly, risky, or requires independent reinforcement from multiple sources.

The primary difference between simple and complex exchanges is the number of exposure sources required for the transmission to be completed, not the number of exposures (Centola & Macy, 2007). Methodologically, it is important that the information and idea exchanges that take place within a social network are simple transmissions because they can be studied on a random network, which facilitates analytic treatment (Erdos & Renyi, 1959) and mathematical approximation (Watts, 2002).

This is an important point. Nascent entrepreneurs can have more frequent communication and access to a larger number of social contacts using online social networks than those using traditional communication methods. Nascent entrepreneurs can use both simple and complex information exchanges with their weak ties by leveraging online social networks. Simple information exchange and hence idea generation can be accomplished in only one transmission, with subsequent transmissions helping with further *fermentation* of the idea. After this initial idea fermentation, but before a venture begins, much action and complex information exchange is likely to take place. These many actions should require more complex information exchanges with selected social contacts or as stated by McAdam and Paulsen (1993) "the fact that we are embedded in many relationships means that any major decision we are contemplating will likely be mediated by a significant subset of those relationships (p.646)."

In contrast to *weak ties*, an individual's *strong ties* share norms thoroughly, requiring little effort to anticipate their intentions and providing consistent access to resources (Granovetter, 1973). These ties are typically represented by family relationships, spouse, or very close friends. Strong ties are typically more eager to assist than weak tie relations (Granovetter, 1983). However, those that possess more personal resources are less likely to rely on strong ties (Cook & Whitmeyer, 1992). As it relates to online social networks, nascent entrepreneurs will derive ideas and information through exchanges with weak ties, but when an action requires confirmation from multiple sources, it is expected that strong ties will be contacted and these contacts may not reside within the online social network. While the non-redundant nature of

weak ties is a primary component for spreading new information; this non-redundant nature becomes a weakness for more complex information exchanges (Centola & Macy, 2007).

Absent ties are relationships that are insignificant in substance, where the extent of the exchange between individuals may be no more than a recognition of knowing them, such as the clerk at a convenience store that we see often – the interaction and novel information flow of these exchanges is negligible, or *absent* (Granovetter, 1973).

2.6 Why Study the Effects of Online Social Networks

The combination of individualism, a drive towards content creation, innovation, and a focus on communal benefit may create conditions ripe for opportunity recognition that do not exist outside of online social networks. Davidsson and Honig (2003) found that bonding and bridging social capital was higher in nascent entrepreneurs than in their control group. The social capital was based on strong ties such as having parents or close relatives that owned their own business, while bridging capital was based on weak ties and was found to be a strong predictor of frequent gestation activities, i.e., for carrying the start-up process further.

Three key findings from their work are relevant to this study: (1) entrepreneurs should develop and promote all sorts of networks, (2) changes and advances in communication technologies increase the feasibility that entrepreneurs can work in distant and autonomous environments, and (3) it would be prudent for nascent entrepreneurs to promote and develop social network capabilities (Davidsson & Honig, 2003). Davidsson and Honig were likely not aware of online social networks as they currently exist since the form and function of online social networks did not take shape until 2004 (Parameswaran & Whinston, 2007). However in retrospect, their findings seem to point to the advent and use these online networks by nascent entrepreneurs.

Granovetter (1973) argued that new information is more easily obtained through casual acquaintances (weak ties) than through close personal relations (strong ties). He went on to argue that although one could have only a limited number of strong tie relationships due to their

high maintenance costs, an individual could have many weak ties within their social network (Granovetter, 1973).

A key part of Granovetter's (1973) argument is that the non-regular interaction with weak ties provides better access to unique information than the regular interaction associated with strong ties. Given that online social networks allow more frequent contact than traditional communication methods (phone, face-to-face), the weak ties within these networks may not provide as much unique information as traditional weak ties. However, the sheer volume of contacts within the network may actually increase the unique information being exchanged.

For individuals to have a redundant network tie, the two would have the same contacts and have a cohesive relationship, one characterized by some emotional closeness (Burt, 1992). Burt's structural hole argument builds on Granovetter's strength of weak ties, positing that a tie provides new information if the tie is non-redundant, or spans a structural hole. Networks rich in structural holes can lead to more unique information and ultimately, the discovery of entrepreneurial opportunities (Burt, 1973).

Burt (1992) also identified that structural hole benefits are the product of both primary and secondary structural holes, with primary holes pertaining to one's direct contacts and secondary holes related to the relations between these direct contacts and third parties, also called secondary contacts. The volume of direct and secondary contacts in an online social network can be much larger than a traditional offline network and one could reason that this should allow for more secondary structural holes. However the flow and amount of new information exchanged between nodes could increase due to the ease with which more frequent interaction can take place. If a stronger emotional connection is established between nodes through the availability and use of rich media (pictures, video), this could affect the nature of these secondary structural holes.

Each year a number of new ventures fail. In order for new ventures to create wealth in the long run, their initial strategies must be founded on unique capabilities derived from innovative combinations of resources (Schumpeter, 1934). Constructing the initial resource base in any new

venture requires resource identification, acquisition, and assembly in order take advantage of a perceived opportunity (Brush et al., 2001). The use of online social networks may provide nascent entrepreneurs the ability to quickly identify and assemble these unique resource combinations.

2.7 Social Capital Theory

Social capital is rather broadly defined in the literature, making a precise link between definition and the many network processes and reciprocities characterized under this term problematic at times (Baron & Hannan, 1994). In general, social capital theory refers to the ability of individuals to derive benefits from their social connections, networks and memberships (Lin, Ensel, & Vaughn, 1981, Portes, 1998). It is multidimensional and can occur at both the individual and organizational level (Nahapiet & Ghoshal, 1998). It is theorized that these social networks can be extended by relationships with family, organizations, or communities and that these can supplement an entrepreneur's education, experience, and financial resources (Bourdieu, 1983; Coleman, 1988, 1990; Loury, 1987).

Emerson (1972) used social capital in terms of social exchange so that the effect of exchange ties on performance could be examined. Davidsson and Honig (2003) were interested in factors related to social relations, examining the effects of exchange ties on performance. Trust can enhance the strength of social capital, forming an exclusive bond that holds tightly knit organizations together (Coleman, 1988; Granovetter, 1985). Social capital also consists of inclusive bridging ties through resources such as information (Putnam, 2000). Although ties associated with social capital are typically attributed to individuals, they can also occur at the organizational level. These ties can be either indirect or direct and their intensity can vary (Davidsson & Honig, 2003).

Entrepreneurs tend to make decisions as a result of associations based on friendship or advice (Bruderl & Preisendorfer, 1998; Paxton, 1999) often consisting of social capital based on weak tie relationships. However Aldrich et al. (1998) refer to the importance of family

socialization, which can inspire autonomy and the delivery of personal networks that provide valuable resources. These strong tie resources can yield better resource utilization efficiency within a nascent entrepreneur venture. From an entrepreneurial perspective, social capital networks can facilitate the discovery of opportunities and help with identification, collection and allocation of scarce resources (Birley, 1985; Greene & Brown, 1997; Uzzi, 1999). Since the discovery process is defined by asymmetrical information between entrepreneurs and the owners of resources that information is likely to come from both strong and weak ties (Shane & Venkataraman, 2000).

These social capital relationships can be defined by the frequency of meetings and social activities, both formal and informal, and the strength of ties (Davidsson & Honig, 2003). Davidsson and Honig (2003) go on to postulate that social capital may help with the exploitation process by not only providing unique information through these various relationships, but through the diffusion of information and other vital resources.

By combining networks and social capital, one creates a very favorable condition for information exchange and the creation of new knowledge (Nahapiet & Ghoshal, 1998). It has been argued that an entrepreneur's social network is their most important source of knowledge (Johannisson, 1990) and new ideas (Christensen & Peterson, 1990). The differences in network characteristics may help to explain the extent of knowledge transfer (Burt, 1992; Coleman, 1988; Davidsson & Honig, 2003) and provide the opportunity for new knowledge generation based on the argument that these existing networks represent differing knowledge bases (Lawson & Lorenz, 1999).

In fact, networks have been associated with how many new opportunities an entrepreneur perceives (Singh, 2000; Singh et al., 1999) and depending on which networks they are embedded in, different individuals may be more likely to recognize opportunities than others (Arenius & de Clercq, 2005). Arenius and de Clercq (2005) also argued that an entrepreneur's human capital is an important mechanism through which access to network contacts can be obtained.

Burt (1992) suggests that social capital creates imperfect competition through the advantage of entrepreneurial opportunities created for certain individuals and not others. The social capital research emphasizes the importance of network connections in establishing new ventures (Adler & Kwon, 2002; Burt, 1992; Nahapiet & Ghoshal, 1998). A number of studies have identified the important role that social capital of entrepreneurs plays in the opportunity recognition process (Ardichvili & Cardozo, 2000; Davidsson & Honig, 2003; de Koning & Muzyka, 1996; Hills, 1995; Hills & Shrader, 1998).

Social capital is defined as the sum of the actual and potential resources that individuals obtain from their direct or indirect ties in social networks (Nahapiet & Ghoshal, 1998). Social capital may be described as the "goodwill available to individuals or groups" which includes feelings of friendship, reciprocity, goodwill, and respect (Adler & Kwon, 2002, p. 23). It tends to emphasize the importance of social networks and the social capital inherent in them for new venture creation (Aldrich & Zimmer, 1986), meaning that social capital can be viewed as an individual asset of goodwill flowing from one's friends, work relations, and general contacts (De Carolis & Saparito, 2006).

Social capital theory may help to explain motivations for participating in social computing. In fact, some believe that there is a direct relationship to the community aspects of and motivation for participation in social computing. Woolcock (1998) describes social capital as "norms and networks facilitating collective actions for mutual benefits." Granovetter (1973) and Coleman (1988) discussed the concept of social capital in the context of benefits accruing to groups and individuals consequent to social interactions. Research in this area has evolved from studying community benefits (Putnam, 1993) and is now exploring how individuals may deliberately develop social interactions, interactions that may lead to individual benefits (Cross, 2004). These individual benefits can take many forms, from tangible or intangible, economic or social to psychological or emotional (Lin, 2001).

As research continues to evolve around the concept of social capital, it is important to clarify its various aspects. Social capital can help to enhance internal organizational trust and

provide resources through the bonding of actors and by bridging external networks (Adler & Kwon, 2002; Putnam, 2000). Bonding social capital is concerned with the substance of network relationships and internal ties within a collective (Adler & Kwon, 2002; Leana & Van Buren, 1999), that may allow the collective to develop self enforcing norms and trust that facilitates collective goal attainment (Coleman, 1988).

Bridging social capital focuses on the individual and their relationships within a given network (Adler & Kwon, 2002; Burt, 1992, 1997). More specifically, it is concerned with how the social capital is used for a given individual's, allowing that individual to use the resources derived from their contacts and connections for their private benefit and personal gain (De Carolis & Saparito, 2006). This dissertation examines the how nascent entrepreneurs anticipate using their networks for competitive advantage and therefore, the bridging approach to social capital will be used. In doing so, the researcher concurs with Adler and Kwon (2002) and De Carolis and Saparito (2006) that "in the context of entrepreneurship, social capital is the goodwill and resources that emanate from an individual's network of social relationships, and its effects flow from the information, influence, and solidarity available to the entrepreneur (p. 43)," extending this to include the nascent entrepreneur. Since information is usually limited, both bridging and bonding social capital may enhance the flow of information.

Puhakka (2006) viewed social capital as the social interaction that brought "information, resources, support, and ideas to entrepreneurs (p. 107)." In order to study this, social capital had to be divided into three dimensions, the structural, relational, and cognitive dimension and opportunity recognition variables were identified as collective action, competitive scanning, innovative behavior, knowledge acquisition, and proactive searching (Puhakka, 2006). Puhakka (2006) found that the amount of social interaction, which is the structural dimension of social capital, positively affected knowledge acquisition, proactive searching, and collective action.

These findings lend support to three critical arguments for the positive impact of online social networks on nascent entrepreneurs: (1) that a wide base of relationships is used to get new information; (2) that one must have an active dialogue with others in order to see future

developments; and (3) the more social relationships one has, the more they will discuss venture creation with them. Puhakka (2006) synthesized this very simply, "the more used you are to social dialogue, the more you also use it in an opportunity recognition process (p. 120)." This generation of nascent entrepreneurs is likely to use online social networks in their everyday dialogue, hinting at the likelihood that they will use these networks in their opportunity recognition process.

Since an entrepreneur obtains information from a variety of perspectives when taking part in active social dialogue, there is an increased likelihood for knowledge development where social relations acts as the focal point for both where and how this knowledge is created (Colarelli, O'Connor & Rice, 2001; Elfring & Hulsink, 2003; Julien & Vaghely, 2001). Puhakka (2006) found that the amount of social interaction does positively affect knowledge acquisition, finding that a wide base of relations is not only used to obtain new information, but to better see future developments. Puhakka (2006) also found that the closeness of relationships positively influenced the entrepreneur in their knowledge acquisition and competitive scanning. In addition, Puhakka (2006) also found that the latest information tends to be shared by those closer to the entrepreneur. An important caveat noted by some researchers, but countered by the weak ties argument, is that the entrepreneur should know these relations on a personal level or it is possible that they will not share this information (Colarelli, O'Connor & Rice, 2001; de Koning & Muzyka, 1996).

There are varying perspectives on whether social capital resides in the relationships, or whether it accrues to the individual participants. Social capital theory's dimensions of networks, trust, reciprocity, willingness to participate and social norms are directly relevant to the factors driving engagement in online communities and sustaining them as social systems (Parameswaran & Whinston, 2007). Lin (2001) found that information resources within these online networks can be easily accessed and used by its members. One aspect for further investigation is how these online networks may impact opportunity recognition.

So, an active and far reaching social network and its wide base of information is needed to evaluate a business situation, more personal contacts are used to evaluate information and make decisions, and the closest of relationships are used to evaluate the collected information in order to better understand future trends (Puhakka, 2006). Do nascent entrepreneurs have any feelings of closeness with those they communicate with using social networks? If this link can be established, one could argue that Puhakka's (2006) findings could apply to relationships established in a nascent entrepreneur's online social network.

Chapter 3: Hypotheses

This section identifies the 13 hypotheses for this study. They not only deal with the differences in the way that nascent entrepreneurs interact with their online and offline networks, but how the use and characteristics of these networks may impact the nascent entrepreneur. Tornikoski and Newbert (2007) define nascent entrepreneurs simply as would-be entrepreneurs. The reasons they give for starting new businesses are similar to those reasons given by non-entrepreneurs for seeking a new job. These reasons range from a need for innovation and freedom to a desire for financial success and recognition from one's peers (Carter, Gartner, Shaver, & Gatewood, 2003). Entrepreneurs use their networks for information exchange and for creating and/or maintaining contacts that represent a variety of relationships based on the frequency of contact, the duration of the relationship, and the intimacy or type of information exchanged (Hatala, 2006; Haythornthwaite, 2005).

This research focuses on the creation and exploitation of opportunities, and more specifically the identification of new ideas and how this may be influenced by the use of online social networks. Kirzner (1973) believed that entrepreneurs discover opportunities through new information that they are exposed to (Shane, 2000). The literature suggests that individuals gain information access through interaction with other individuals, who are linked to others. As discussed in Section 2.0, social networks play a fundamental role in the spreading of ideas, information, and influence, and the mechanisms involved have been studied throughout the social sciences (Kempe, Kleinberg, & Tardos, 2003).

The combination of networks and social capital create very favorable conditions for information exchange (Nahapiet & Ghoshal, 1998), with the social network representing an entrepreneur's most important source of knowledge (Johannisson, 1990) and new ideas (Christensen & Peterson, 1990). Differences in network characteristics may help to explain the extent of knowledge transfer (Coleman, 1988; Burt, 1992; Davidsson & Honig, 2003) and provide the opportunity for new knowledge generation (Lawson & Lorenz, 1999).

As previously identified in Section 1.0, a greater number of people are embracing these online social network sites to facilitate friendships and acquaintances alike (Howard, 2008; Kirkpatrick, 2007; Kowske & Southwell, 2006). With the increasing popularity of online social networks, it is likely that they will continue to leverage this medium as they enter the work world, especially since many companies are allowing employees to build connections and network within company parameters (Zeidner, 2007) and leverage third party social networking sites for their recruitment (Brockett, 2007). Since much of this effort is focused on the non-entrepreneur, it is important to determine if nascent entrepreneurs use online social networks to increase their business knowledge and experience.

Hypotheses 1a and 1b compare the number of online and offline contacts a nascent entrepreneur communicates with. Hypotheses 2a and 2b are focused on the information exchange differences between a nascent entrepreneur's online and offline networks. Hypotheses 3a and 3b are concerned with how nascent entrepreneurs use their online and offline social networks to gain business contacts to help with future ventures while hypotheses 3c and 3d deal with entrepreneurial idea identification differences between online and offline social networks. Hypothesis 3e deals with whether the use of online social networks websites increases business knowledge. Hypothesis 4a compares the number of online and offline weak ties of the nascent entrepreneurs. Hypotheses 4b and 4c mimic 4a respectively, but focus on strong ties instead of weak ties. Hypothesis 5 is concerned with the correlation between the number of contacts within an online network and the number of entrepreneurial ideas a nascent entrepreneur will identify.

For simplicity and clarity of the hypotheses in this study, *offline* contacts refer to those members of one's social network that are communicated with via one of two methods, face-to-face or telephone. *Online* contacts refer to those members of one's social network that are communicated with via an online social network and the tools provided by that network; such as video sharing, blogging, text, instant messaging, email, posting of information/files, and use of Skype, which is a VoIP product. Individuals that use an online social networking site can and do, still communicate using offline methods. In fact, they are likely to communicate with some of their

social networking contacts using both online and offline methods. For purposes of this study, it is imperative to separate those social network contacts communicated with via online and offline methods. Therefore, contacts communicated with via only offline methods (face-to-face and telephone) will be designated as *offline-only* contacts. In addition, *online nascent entrepreneur* refers to nascent entrepreneurs that use an online social networking site while *offline nascent* refers to nascent entrepreneurs who do not use an online social networking site.

As discussed earlier in Section 2.0, the increasing use of social networking sites has enabled those with available time and computer acumen to post and share a massive amount of information online for others to access (Boyd & Ellison, 2007; Coyle & Vaughn, 2008; Kleinberg, 2007; Parameswaran & Whinston, 2007). The automated tools and the data broadcast capability of online social networks like MySpace and Facebook can influence communication with one's social network. For example, these tools can allow anyone to communicate with more contacts, with increased frequency, and with less effort than it would take with one's offline network contacts. The ease of connection that online social networks provide make these networks an integral part of everyday life for some individuals (Boyd & Ellis, 2007).

Online communities and face-to-face communities tend to share many of the same characteristics, such as a feeling of membership, some shared emotional connection, the ability to influence one another, and information exchange (Hersberger, Rioux, & Crultt; 2005). Large online social networks not only allow for multiple types of information exchange, but include individuals with varying types of relationships, or ties, with the nascent entrepreneur. Choi (2006) found that 85% of Cyworld users (a Korean online social network) identified their primary motive for the service was to "maintain and reinforce preexisting social networks (p. 181)." Weiss (2005) argues that this rush to share information and ideas via computer networks is driving a new evolution of information and idea exchange, referred to as mass collaboration. The following hypotheses will test these conditional propositions.

Hypothesis 1a: Nascent entrepreneurs who use an online social networking site communicate with a greater number of their contacts than nascent entrepreneurs who do not use a social networking site.

Hypothesis 1b: Nascent entrepreneurs who use an online social networking site communicate with a greater number of their online contacts than with their offline-only contacts.

Common interests and social interaction help to build relationships in both online and traditional offline social communities, but the primary methods of interaction tend to differ between these communities (Hersberger et al., 2005). Hersberger, Murray, and Rioux (2007) argue the nature of communication that takes place in online networks differs from traditional offline networks. More specifically, they argue that online networks are supported through formal and informal information exchange (Hersberger et al., 2007) while offline networks are built on shared experiences and gift exchange at various occasions such as birthdays and deaths (Gusfield, 1975).

While offline network communication tends to be built on proximity, information exchange becomes a much more critical factor for online network communication since it is built on text and graphics (Hersberger et al., 2005, Hersberger et al., 2007). Puhakka (2006) found that the latest information tends to be shared by those closer to the entrepreneur. Not only are online networks good for sharing general information, but the broadcast capabilities of online networks, with the ability to write or post information once for many to view, may also increase the likelihood that new information is shared more quickly and frequently using them.

Nascent entrepreneurs can have more frequent communication and access to a larger number of social contacts using online social networks than those using traditional communication methods such as the phone or face-to-face. Rioux (2005) argued that behaviors centered around information sharing and acquisition are the primary means by which online network relationships are established and grow. Puhakka (2006) found that the amount of social interaction does positively affect knowledge acquisition and that a wide base of relations is not only used to obtain new information, but to better see future developments. With more frequent contact and a larger quantity of contacts, one could argue that the amount of information

exchanged in an online network should be larger than the amount exchanged in an offline network. The following hypotheses are based on these conditional propositions.

Hypothesis 2a: Nascent entrepreneurs who use an online social networking site exchange more information with their contacts than nascent entrepreneurs who do not use a social networking site.

Hypothesis 2b: Nascent entrepreneurs who use an online social networking site exchange more information with their online contacts than with their offline-only contacts.

The increasing use of social networking sites has had a fundamental effect on communications and has changed the way that many individuals socialize (Davis, 2007). Typical computer-mediated community interaction includes: news, idea, and information sharing; sharing of pictures and video; event announcements; problem solving; and routine communication such as email and text chat (Koh et al., 2007). By providing such a dynamic medium for information and idea sharing, online social network sites may represent an environment from which entrepreneurs can generate ideas. The larger number of social network members, the greater frequency in communication with those members, and the availability of pattern recognition software at these sites may combine to increase a nascent entrepreneur's likelihood of identifying entrepreneurial ideas and recognizing opportunities. The social networking advantages of these online sites provide nascent entrepreneurs with the ability to quickly identify and assemble unique resource combinations, providing an environment ripe with opportunities to exploit.

New business creation accounts for nearly one third of the economic growth variance in many industrialized countries (Davidsson, Lindmark, & Olofsson, 1994; Reynolds, 1994; Reynolds et al., 2000; Reynolds & Maki, 1990). Entrepreneurs tend to embed the formation and growth of their businesses in social structures (Aldrich & Zimmer, 1986; Birley, 1985; Greve & Salaff, 2003). They tend to collect ideas and information and then construct them into an opportunity by using social networks (Hills, Lumpkin, & Singh, 1997; Puhakka, 2006; Singh, 2000).

Since entrepreneurs tend to embed their business decisions in social structures (Borch, 1994; Greve & Salaff, 2003; Hansen, 1995; Larson & Starr, 1993; Reynolds, 1991; Starr &

MacMillan, 1990), network maintenance is important. Their social networks also tend to be well-established and are used to obtain and generate business ideas (Brown & Butler, 1995) and to get advice and resources to launch a business (Granovetter, 1985; 1992). It is also important to note that entrepreneurial access to contacts and resources contained in these networks tends to be consistent across cultures (Greve & Salaff, 2003). The link between traditional social networks and online social networks continues to evolve. Part of that evolution is determining if previous research regarding entrepreneurial social networks applies to online social networks. The following hypotheses will determine whether nascent entrepreneurs increase their business contacts, level of business knowledge, the number of entrepreneurial ideas, and their overall ability to recognize opportunities through the use of online social networks. The following hypotheses will attempt to test these conditional propositions.

Hypothesis 3a: Nascent entrepreneurs who use an online social networking site will identify more contacts they believe will help them with future business ventures than nascent entrepreneurs who do not use an online social network.

Hypothesis 3b: Nascent entrepreneurs who use an online social networking site will identify more contacts they believe will help them with future business ventures from their online contacts than from their offline-only contacts.

Hypothesis 3c: Nascent entrepreneurs who use an online social networking site will identify more entrepreneurial ideas than nascent entrepreneurs who do not use a social networking site.

Hypothesis 3d: Nascent entrepreneurs who use an online social networking site will identify more entrepreneurial ideas from their online contacts than from their offline-only contacts.

Hypothesis 3e: Nascent entrepreneurs who use an online social networking site will increase their level of business knowledge.

As discussed before, one of the most recognized published works within social network theory is Granovetter's (1973) Strength of Weak Ties. This theory describes how individuals differ in the way they interact and share information with others. More specifically, social relationships tend to be viewed in terms of *nodes* and *ties* and the social network is like a map that conveys all relevant ties (connections) between nodes. As discussed in Section 2.0, the

strength of a tie is the combination of the amount of time, emotion, intimacy, and level of reciprocity existent between individuals within an interpersonal network (Granovetter, 1973). Later research by Marsden and Campbell (1984) argued that emotional intensity is the best indicator of tie strength. Since research has shown that individuals tend to maintain only a handful of strong ties (Singh, 2000), it would stand to reason that a majority of one's online social network would be made-up of weak ties.

Online networks support the maintenance of a pre-existing social network as well as connecting with others based on shared interests, political views, common friends, and hobbies (Boyd & Ellison, 2007). When someone first joins an online social network, they are typically prompted to identify others in the network that they have a relationship with. This relationship can be called many things, but the most popular is *friend*, which usually (but not always) requires a bi-directional relationship (Boyd & Ellison, 2007). Therefore, use of the term *friend* online can be somewhat misleading when compared to the use of friend when describing offline relationships (Boyd, 2006). The "friending" nature of online social networks encourages people to seek out and adopt new contacts, an activity that can act as a catalyst for social interest (Fono & Raynes-Goldie, 2006).

The ever-changing nature of relationship-building in both online and offline communities can lead to either strong or weak tie relationships, depending on the type of information exchange that takes place (Hersberger et al., 2007). Although online networks do make it easy to seek out and establish new contacts, current research suggests that users spend more time searching for people they already have some sort of offline connection or commonality with (Lampe, Ellison, & Steinfield, 2006). This offline connection may not be a strong one, but does provide enough of a connection to warrant or motivate further communication. This seems to be especially true for the younger generation. A recent study found that 91% of U.S. teens use online networks primarily to connect with their offline friends (Lenhart & Madden, 2007). These communication capabilities, combined with the ease of connecting with new and existing contacts alike, should result in the

ability for a nascent entrepreneur to maintain and interact with a larger number of weak ties through online social networks than they can offline. This leads to the following hypothesis:

Hypothesis 4a: Nascent entrepreneurs who use an online social networking site will possess a larger number of weak ties than nascent entrepreneurs who do not use an online social networking site.

Using the many tools available on these online networking sites, users can share photos and videos, engage in blogs and instant messaging, thereby providing a platform for both in-depth and frequent information exchange (Boyd & Ellison, 2007). The capability for in-depth and frequent information exchange should help to support the maintenance of strong tie contacts on social networks as well. In contrast to *weak ties*, an individual's *strong ties* share norms thoroughly, requiring little effort to anticipate their intentions and providing consistent access to resources (Granovetter, 1973). Strong ties are typically more eager to assist and are more easily available than weak tie relations (Granovetter, 1983).

Haythornthwaite (2005) used the term latent ties to describe the online and offline contacts maintained using online social networks, while Boyd and Ellison (2007) described it as one's extended network. Ellison, Steinfield, and Lampe (2007) argue that Facebook users not only maintain communication with offline contacts, but use the online networks to solidify offline connections as well. Although many of these offline connections can be considered weak ties (Boyd & Ellison, 2007), it can be argued that the extensive maintenance of pre-existing offline contacts should include some strong tie relationships. Said another way, if online social networks support in-depth and frequent information exchange and are used to more easily maintain pre-existing offline contacts, then these networks should be used by nascent entrepreneurs to maintain strong tie relationships too. In addition, the automated communication tools and overall ease of providing in-depth information should motivate nascent entrepreneurs that use online social networks to communicate more often with their strong ties than those that only use offline methods. The following hypotheses will attempt to formalize these conditional propositions.

Hypothesis 4b: Nascent entrepreneurs who use an online social networking site will possess a larger number of strong ties than nascent entrepreneurs who do not use an online social networking site.

Hypothesis 4c: Nascent entrepreneurs who use an online social networking site will exchange information more often with their online strong tie contacts than with their offline-only strong tie contacts.

The idea of mass collaboration is potentially of great benefit to a nascent entrepreneur's use of online networks, where a collaborative spirit and the aggregation of multiple bits and pieces of information can provide a large source for ideas and innovation – all at their fingertips. Singh (2000) found that entrepreneurs with larger networks were exposed to more opportunities. Expanding on this research of traditional offline networks, one can postulate that those with larger online networks should be exposed to more opportunities, especially with the increased amount and frequency of information exchange within these online networks. The final hypothesis to be tested follows:

Hypothesis 5: The number of contacts within a nascent entrepreneur's online social network is positively related to the number of entrepreneurial ideas they identify.

Chapter 4: Methods

This section describes how the 13 hypotheses identified in Section 3.0 were tested. It begins by describing details around the survey questionnaire and its validation. The survey sample is then described, along with the survey procedure and related data collection. Variables used in the analysis are then listed and finally, statistical methods used to test the hypotheses are described.

4.1 Survey Questionnaire

Data for this dissertation was collected by an online survey tool called SNAP. Factor analysis was used to determine whether the survey instrument was sensitive enough to discriminate between and among the sampled groups in order to determine if the survey questions were valid and reliable enough to measure each hypothesis. A small group of 10 volunteers took part in a pilot study to refine the survey questionnaire and then another small group pre-tested the final survey instrument before its disbursement to the sample group. Volunteers for the pilot study and pretest groups were previously acquainted with the researcher.

A final copy of the survey used for this study is included as Appendix 1. In order to assess all 13 hypotheses in this study, a variety of question types were used. The survey includes entrepreneurial idea identification and information exchange measures, demographic and socio-economic characteristics of the sample nascent entrepreneurs, and general questions about their Internet usage habits, business-founding expectations, and communications habits. Personal demographic questions about the non-nascent entrepreneur respondents and general questions about their online social network use were also included in the survey.

4.1.1 Survey Questionnaire Development

After an extensive review of the literature, an initial survey questionnaire was developed. The survey was designed based on the following factors:

a. Determination of data necessary for hypothesis testing
b. A review of various questionnaire construction techniques

c. Input from the researcher's dissertation committee, all of whom have extensive questionnaire development experience
d. Pre-test of the questionnaire
e. Follow-up interviews with those taking the pre-test

Eventually, a 35 question survey instrument was constructed for a pilot study. The survey instrument included some questions that required straight numerical data inputs and several 5-point Likert scales. Likert scales were chosen in order to simplify respondent self-administration and survey instrument construction.

4.1.2 Pilot Study

The purpose of the pilot study was to illicit feedback about the initial questionnaire format, questionnaire directions, and understanding of content. The researcher administered the survey instrument to a convenience sample of 10 nascent entrepreneurs, made-up of colleagues and/or co-workers that would not be participating in the actual study. Seven members of the pilot study used online social network sites and three did not. Each took the survey independent of the researcher and then was interviewed within one hour of taking the survey. Pilot study participants were asked a number of questions, which are identified in Table 2.

Table 2: Pilot Study Questions

Question #	Question
1	Which questions were easiest and most difficult to understand?
2	Were there any directions that were confusing?
3	Were the explanations of concepts provided (such as nascent entrepreneur, online social network, and offline social network) clear and concise
4	Did the scales make sense for the questions asked?
5	Should any of the questions be re-ordered or grouped together for better understanding or "flow" of the instrument?
6	Was the online survey tool easy to use?
7	Any other feedback or suggestions to improve the survey?

The self-administered survey included Likert scale items and numeric responses to specific questions. The pilot study group was asked questions beforehand to ascertain their level of computer acumen and experience with taking online surveys. After taking the paper-based survey, respondents were asked to rate their understanding of questions, quality of definitions

provided, length of survey, overall 'flow of the survey (did the order of survey questions seem to make sense), appropriateness of survey length, and any other feedback they considered appropriate. Based on the pilot study results and feedback from the researcher's dissertation committee, the survey questionnaire was revised as identified in Table 3.

Table 3: Survey Question Revisions Based on Pilot Study

Question #	Question
Item 1	Reordered and grouped data input items for better clarity and ease of survey completion.
Item 2	Adjusted some of the Likert scales to scales of agreement in order to more accurately capture the response intent.
Item 3	Reworded some directions for clarity.
Item 4	Changed the order of some questions to reduce confusion.
Item 5	Adjusted the web-based survey software to correct a question display issue.

The updated survey instrument was then loaded into the online survey tool SNAP and pretested on a separate group of five individuals. Their survey responses were processed using the online survey tool. There was a brief phone call follow-up with each of the five pretest participants to determine if the directions were clear and to identify any remaining issues with the survey instrument and/or online survey tool.

4.1.3 Instrument Validation

The time and nature of research designs associated with social science research do result in some research limitations. Validity of the data can be affected by the respondents understanding of the questions asked and their willingness to answer them honestly. Through feedback from the pilot and pretest groups, a brief explanation of key terms, such as nascent entrepreneur, entrepreneur, online social network, offline social network, and entrepreneurial ideas were provided throughout the survey instrument in order to minimize any misunderstanding of questions.

Self-report measures could also be a limitation. Landstrom and Windborg (1995) argue that respondents can be influenced by their perception of a desirable response, leading to self-report bias. This limitation was addressed in two ways. First, the researcher was removed from

direct student contact through use of an Internet-based survey and second, the researcher severely limited his contact with respondents.

Reliability

The reliability of a measure refers to the consistency and stability of a measure. Reliability was determined through use a Paired Correlation *t*-test on a resurvey sample of 54 respondents. Nine class sections (five continuing education and four undergraduate) totaling 93 students were asked to retake the survey. The resurvey request was sent to each of the nine instructors ten days after respondents initially completed the survey. Of the 93 possible respondents, 55 students completed the survey. One survey had to be discarded due to incomplete responses.

The resurveys were assessed for their reliability of responses from one survey to the other. A total of 29 questions from the survey were assessed for reliability. Table 4 shows results of the paired correlations for the items. Twenty-six of the 29 individual item coefficients were above .90, two were above .80 and one was .711.

Table 4: Paired Samples Correlations for Test–Retest Group

Question	Question Synopsis	N	Correlation	Sig.
Q3a	How many online contacts	49	.985	.000
Q3b	How many offline contacts	54	.980	.000
Q3c	How many contacts are both online/offline	49	.811	.000
Q4a	Number of online contacts communicated with weekly	49	.971	.000
Q4b	Number of offline contacts communicated with weekly	54	.931	.000
Q4c	Number communicated with weekly that are both online/offline	49	.916	.000
Q5a	Number of online business contacts	49	.844	.000
Q5b	Number of offline business contacts	54	.983	.000
Q5c	Number of business contacts that are both online/offline	49	.967	.000
Q6a	Number of online contacts considered "very close"	49	.967	.000
Q6b	Number of offline contacts considered very close	54	.999	.000
Q6c	Number of contacts considered very close that are both online/offline	49	.942	.000
Q7a	Information exchange comparison between online/offline networks.	49	.988	.000
Q7b	Comparing information exchange of online/offline very close contacts	49	.994	.000
Q7c	Communication comparison between online/offline networks.	49	.980	.000
Q7d	Estimation of general business increase since using online network.	49	.908	.000
Q7e	Information exchange within online network	49	.939	.000
Q8a	Weekly information exchange within online network	49	.928	.000
Q8b	Weekly information exchange within offline network	54	.711	.000
Q8c	General business information exchange within online network	49	.933	.000
Q8d	General business information exchange within offline network	54	.926	.000
Q8e	Financial information exchange within online network	49	.960	.000
Q8f	Financial information exchange within offline network	54	.959	.000
Q8g	Marketing information exchange within online network	49	.967	.000
Q8h	Marketing information exchange within offline network	54	.978	.000
Q11b	Entrepreneurial idea estimate for the last year	54	.998	.000
Q12a	Is online network a more important source for business contacts	48	.972	.000
Q12b	Entrepreneurial ideas comparison between online/offline networks	49	.973	.000
Q12c	Relationship between online network growth & entrepreneurial ideas	49	.951	.000

Validity

Both internal and external validity are important for any study. Internal validity items considered in this study were non-response bias and face validity. Face validity helps to determine whether the operationalization of a construct within a survey instrument seems to accurately capture the construct. Face validity was determined through interviews conducted as part of a third and final pre-study assessment.

As previously identified, two groups (one pilot and one pretest) were used, along with review and critique with four experienced researchers, in order to complete the final survey design. The final survey instrument was then reviewed by four individuals, each referred by a colleague of the researcher. None of the four individuals surveyed were previously familiar with the research, but each was previously acquainted with the researcher. The researcher then had these four respondents review the online survey instrument independently. Each individual read each question and then provided the researcher with their perspective on what each question was asking and how they would respond. Results from the four interviews confirmed face validity of the measures. None of these four completed surveys were included in the final survey sample.

Non-response bias is concerned with whether those that did not respond to the survey differ significantly from those that did respond. Armstrong and Overton (1977) recommend that returned surveys be separated into successive groups with the last group of late responders acting like a proxy for non-responders. There were a total of 48 responses in the non-responder proxy group and a total of 234 in the combined response group. A two-tailed *t*-test was conducted to compare means of the two groups according to factors such as age, gender, and level of education. An analysis of *t*-test results showed no significant difference between responder and non-responder proxy groups in age, gender, and level of education, with all three factors showing a significance of $p<.001$.

External validity is synonymous with determining whether results can be generalized to other circumstances. As identified earlier, courses were selected based on the likelihood that they would contain nascent entrepreneurs. Participating community colleges ran multiple sections of the targeted courses on various days and at various times throughout the semester. Although the courses were pre-selected, the participating course section was not. The VP/Dean of each participating college randomly selected the course sections and instructors that would participate in the study sample. In addition, the inclusion of continuing education courses provided a more robust age and level of education distribution than could have been achieved by targeting undergraduate students alone. The researcher acknowledges that limiting the sample

to just one state and using only community college students could taint the sample with a regional and/or cultural bias.

4.2 Survey Sample

Participants included both undergraduate students and adults taking continuing education business courses from community colleges within the state of Maryland. Responses from the two groups were combined into a single dataset. The student groups were chosen for the following reasons:

1. The continuing education business courses selected tend to attract individuals seeking skills and knowledge associated with starting a business.
2. The undergraduate business courses chosen tend to attract individuals 18 – 24 years old who use online social networks and may attempt to start a business in the future.
3. The current position of the researcher provided the opportunity to obtain good response rate from the sample population.

Sample

The students sampled were registered at nine (9) of the sixteen (16) community colleges within the state of Maryland. The nine participating colleges were:

Anne Arundel Community College
Carroll Community College
Cecil College
Chesapeake College
The Community College of Baltimore County
Harford Community College
Howard Community College
Montgomery College
Prince George's Community College

Only students taking business courses were selected for the undergraduate group. The continuing education courses selected tend to include those looking to start a business: *How to Start Your Own Business, Strategic Business Planning, Introduction to Strategic Marketing, Real Estate Investing, Opening a Food Service Business, Finance for the Non-Financial Manager, Mastering Sales Presentation Skills, and Negotiating and Handling Objections to Sales.*

The college enrollments for the nine community colleges range from 800 to 18,000 full-time undergraduate students. The number of course sections offered at each college for the courses selected range from 6 to 50 within a given year. Surveys were administered through an Internet based program and participants were asked to voluntarily participate through direct contact with their instructor, who was selected by the associated Dean or Vice President at each college. The survey instrument and collection of data remained open for two calendar months (62 total days) during the months of November and December, 2009. Survey participants were told that the research objective was for research and analysis only. The sample remained blind to the focus subjects of the study to prevent bias. Anonymity was guaranteed by the distribution method utilized via the Internet.

Participants self-identified their entrepreneurial status in Question 9 of the survey. The question asked "Which of the following best describes your entrepreneurial experiences?" The six choices given each respondent are identified below:

a. ___ I am currently an entrepreneur.
b. ___ I am not currently an entrepreneur, but I have been one in the past.
c. ___ I am in the process of trying to start a business.
d. ___ I am not currently trying to start a business, but plan to in the near future.
e. ___ I am not currently trying to start a business, but may in the next few years.
f. ___ I am not planning to start a business.

Respondents could select all that currently applied to them. Anyone selecting "a" was considered an entrepreneur. As previously stated, the definition of nascent entrepreneur being used for this study is that of Tornikoski and Newbert (2007), who defined nascent entrepreneurs simply as would-be entrepreneurs. Therefore, respondents selecting "c" or "d" were considered nascent entrepreneurs for the purposes of this study. Those selecting "b", along with either "c" or "d" were also considered nascent entrepreneurs for the purposes of this study. Those selecting "b" alone and those marking either "e" or "f" were considered non-entrepreneurs for the purposes of this study.

4.3 Survey Procedure

For the study, the researcher contacted the Continuing Education Dean/Vice President at each college in order to obtain permission for survey distribution. Each VP/Dean identified and spoke with instructors who volunteered for participation in this study. Instructors choosing to participate were forwarded a standard email (Appendix 2). This email was then forwarded to students by each instructor directly or through use of WebCT or Blackboard. The email contained a link to the online survey. By clicking on the link, students voluntarily agreed to participate in the survey.

Two follow-up requests for survey completion were made throughout the duration of the two month survey period. Since this study involved human subjects, the protocols for this study were submitted for approval to each participating school. Approval was obtained either from the appropriate Vice President or IRB Committee, when one existed. An introductory email was written by the researcher to each participating Vice President/Dean to familiarize them with the survey to be conducted and key concepts within that survey. After speaking with each of the participating Vice Presidents/Deans, the first official survey email was sent to each for distribution to the participating instructors within each of their colleges. The email (Appendix 2) included the following items to decrease non-response bias:

a. An introduction that included a reference to Morgan State University as a symbol of legitimacy
b. A promise of anonymity and confidentiality to respondents
c. Contact information of the researcher for legitimacy of the survey
d. A statement that made it clear to each respondent that they were agreeing to voluntarily participate in the study by clicking on the web link provided.
e. Two follow-up emails, each three weeks apart, were sent

4.4 Data Collection

A total of three response requests were sent via email to the study samples, each followed by a number of completed surveys. To insure that the data were normally distributed and contained no bias, the data were cleaned after each of the three response requests.

Cleaning of data included discarding responses for incompleteness, coding them for analysis, and transforming/computing variables needed to conduct analysis. Table 5 summarizes the responses received from the first, second, and third survey request emails.

Table 5: Response of Survey Requests

First Survey Request	
Final Sample Size	931
Responses	81
Usable Responses	80
Usable Response Rate (from Total)	8.59%
Second Survey Request	
Responses	155
Usable Responses	154
Usable Response Rate (from Total)	16.54%
Final Survey Request	
Responses	49
Usable Responses	48
Usable Response Rate (from Total)	5.16%
Total Usable Responses	282
Total Usable Response Rate	30.29%

The overall usable response rate of 30.29% achieved for this study was within the typical response rates range of 11% to 34% as identified by Stimpert (1992). It also compares very favorably to previous opportunity recognition studies such as Corbett (2002), Ozgen (2003), and Singh (2000) who achieved 25.2%, 15.2%, and 18.3% respectively. Survey responses were downloaded into Excel and coded as they were received. The data was then organized and uploaded into SPSS for further analysis. A priori analysis included descriptive statistics, test of means, regression, and correlations.

4.5 Variables Used in the Statistical Analysis

The following is a list of all variables used in the statistical analyses. On the survey, respondents were asked for a number of questions to identify the number of online or offline contacts. Due to the age range of respondents, both "friends" and "contacts" were used to describe the number of individuals in their social networks. Contacts will be referred to as simply "contacts"

for the remainder of this dissertation. Online contacts were those that the respondent communicated with via their online social network and offline contacts were those that they communicated with via traditional means, such as face-to-face and telephone. Respondents were also asked to identify those contacts that they communicate with both online and offline. This was done primarily to help respondents better distinguish between their online and offline contacts, but also for future research.

AGE: This variable is the age of the nascent entrepreneur in years. It was taken directly from the survey (Question 18).

GENDER: This variable represents the gender of the nascent entrepreneur. It was taken directly from the survey (Question 17). The variable was coded "0" for male and "1" for female.

EDUCATION: This is the highest education level currently attained by the nascent entrepreneur. It was taken directly from the survey (Question 13). The values were based on an interval scale of education level, from 1="High School Diploma" to 8="Graduate Degree."

TRADE/INDUSTRY CERTIFICATION OR LICENSE: This variable represents whether the respondent currently holds a trade/industry certification or license. Since some trades-related individuals were included in this study, trade/industry certification and/or licenses are an important educational component and were included. Participants were asked to respond either YES or NO as to whether they hold a certification or license. It was taken directly from the survey (Question 16). The variable was coded "1" for "YES" and "0" for "NO."

RACE/ETHNICITY: This variable identifies the race/ethnicity of the nascent entrepreneur. The measure was taken from Question 19. "African American/Black" was coded as "1", "American Indian" was coded as "2", "Asian American" was coded as "3", "Hispanic/Latino" was coded as "4", "Caucasian/White" was coded as "5", and "Other" and non-responses were coded as "0".

ONLINE SOCIAL NETWORK USE: This variable identifies those using an online social network site. The measure was taken from Question 1. Those answering YES were coded as "1" and those answering NO were coded as "2".

ENTREPRENEUR: This variable identifies all self-identified entrepreneurs. Only those marking "I am currently an entrepreneur" on Question 9 were considered entrepreneurs for this study. Self-identified entrepreneurs were coded as "1". All respondents marking "I am not planning to start a business" were coded as "0".

NASCENT ENTREPRENEUR: This variable identifies all self-identified nascent entrepreneurs. Those marking any of the following were considered a nascent entrepreneur for this study, "I am in the process of trying to start a business" or "I am not currently trying to start a business, but plan to in the next year." Those marking "I am not currently an entrepreneur, but have been one in the past" were considered nascent entrepreneurs only if they marked that in conjunction with the first two identified nascent entrepreneur options. Self-identified nascent entrepreneurs were coded as "2". Since respondents could choose more than one response, anyone selecting either of these nascent entrepreneurial options was considered a nascent entrepreneur for the purpose of this study.

ONLINE NASCENT ENTREPRENEUR: This variable identifies all nascent entrepreneurs that use online social network sites as determined by responses to Question 9.

OFFLINE NASCENT ENTREPRENEUR: This variables identifies all nascent entrepreneurs that do not use online social network sites as determined by responses to Question 9.

ONLINE NASCENT ENTREPRENEUR ONLINE WEAK TIES: This variable was calculated by subtracting the "very close" online contacts (Question 6a) from the total number of online contacts (Question 3a).

ONLINE NASCENT ENTREPRENEUR OFFLINE WEAK TIES. This variable was calculated by subtracting the "very close" offline contacts (Question 6b) from the total number of offline contacts for online nascent entrepreneurs (Question 3b).

OFFLINE NASCENT ENTREPRENEUR OFFLINE WEAK TIES: This variable was calculated by subtracting the "very close" offline contacts (Question 6b) from the total number of offline contacts for offline nascent entrepreneurs (Question 3b).

ONLINE NASCENT ENTREPRENEUR ONLINE STRONG TIES: This variable was determined for online nascent entrepreneurs through responses to Question 6a, which asked how many "very close" online contacts they had.

ONLINE NASCENT ENTREPRENEUR OFFLINE STRONG TIES. This variable was determined for online nascent entrepreneurs through responses to Question 6b, which asked how many "very close" offline contacts they had.

BUSINESS KNOWLEDGE GAINED THROUGH AN ONLINE SOCIAL NETWORK: This is the online nascent entrepreneur's determination of whether they had increased their business knowledge through use of their online social network using a five point scale of agreement (Question 7d). The values were based on a five-point Likert scale of agreement, from 5="Strongly Agree" to 1="Strongly Disagree." Scale items were coded based on their assigned value, from 1 to 5.

TOTAL NUMBER OF CONTACTS FOR ONLINE NASCENT ENTREPRENEURS: This was calculated by adding the number of online contacts (Question 3a) and offline contacts (Question 3b) for online nascent entrepreneurs.

TOTAL CONTACTS FOR OFFLINE NASCENT ENTREPRENEURS: This was determined by responses to Question 3bfor offline nascent entrepreneurs.

ONLINE CONTACTS COMMUNICATED WITH FOR ONLINE NASCENT ENTREPRENEURS: This was determined through responses to Question 4a, which asked for the number of online contacts online nascent entrepreneurs identified they communicated with weekly.

OFFLINE CONTACTS COMMUNICATED WITH FOR ONLINE NASCENT ENTREPRENEURS: This was determined through responses to Question 4b, which asked for the number of offline contacts online nascent entrepreneurs identified they communicated with weekly.

OFFLINE CONTACTS COMMUNICATED WITH FOR OFFLINE NASCENT ENTREPRENEURS: This was determined through responses to Question 4b, which asked for the number of offline contacts offline nascent entrepreneurs identified they communicated with weekly.

COMPARISON OF NUMBER OF ONLINE AND OFFLINE CONTACTS COMMUNICATED WITH: This was the online nascent entrepreneur's determination of whether they communicate with more of their online contacts than with their offline-only contacts. It was determined through responses to Question 7c using of a five point scale of agreement, from 5="Strongly Agree" to 1= "Strongly Disagree." Scale items were coded based on their assigned value, from 1 to 5.

ONLINE BUSINESS CONTACTS FOR ONLINE NASCENT ENTREPRENEURS: This was determined through responses to Question 5a, which asked for online nascent entrepreneurs to identify how many business contacts were part of their online social network.

OFFLINE BUSINESS CONTACTS FOR ONLINE NASCENT ENTREPRENEURS: This was determined through responses to Question 5b, which asked for online nascent entrepreneurs to identify how many business contacts were part of their offline social network.

TOTAL BUSINESS CONTACTS FOR ONLINE NASCENT ENTREPRENEURS: This was calculated by adding online and offline business contacts for online nascent entrepreneurs.

TOTAL BUSINESS CONTACTS FOR OFFLINE NASCENT ENTREPRENEURS: This was determined through offline nascent entrepreneur identification of how many business contacts are part of their offline social network.

COMPARISON OF ONLINE AND OFFLINE BUSINESS CONTACTS FOR ONLINE NASCENT ENTREPRENEURS: This was the nascent entrepreneur's determination of whether their online social network was a more important source for business contacts than their offline social network. This was derived from Question 12a based on a five-point interval scale of agreement, from 5="Strongly agree" to 1="Strongly Disagree." Scale items were coded based on their assigned value, from 1 to 5.

ONLINE INFORMATION EXCHANGE FOR ONLINE NASCENT ENTREPRENEURS: This was determined through a two step calculation that took into account both the amount of information exchanged and the number of contacts communicated with. The first step was determined through online nascent entrepreneur responses to a six point interval scale of magnitude (Question 8a) concerning how much information they exchange with their online contacts. The

values were designed to create a proportion in the final calculation. The second step included multiplying the number from the first step by the number of online contacts.

OFFLINE INFORMATION EXCHANGE FOR ONLINE NASCENT ENTREPRENEURS: This was determined through the same two step calculation used for online nascent entrepreneur online information exchange except that it was used on offline contacts (Question 8b) for online nascent entrepreneurs.

TOTAL INFORMATION EXCHANGE FOR ONLINE NASCENT ENTREPRENEURS: This was determined by adding online and offline information exchange answers for online nascent entrepreneurs.

TOTAL INFORMATION EXCHANGE FOR OFFLINE NASCENT ENTREPRENEURS: This was determined through the same two step calculation used for online nascent entrepreneur offline information exchange, for offline nascent entrepreneurs.

COMPARING ONLINE AND OFFLINE INFORMATION EXCHANGE WITH STRONG TIES FOR ONLINE NASCENT ENTREPRENEURS: This was determined for online nascent entrepreneurs through responses to Question 7a using a five point Likert scale of agreement that ranged from 5="Strongly Agree" to 1="Strongly Disagree," with 3 representing "Neither Agree/Disagree." The question asked for the online nascent entrepreneur agreement with the following statement, "I exchange more information with my very close online contacts than with my very close offline contacts."

ENTREPRENEURIAL IDEAS FOR ONLINE NASCENT ENTREPRENEURS: This was determined through online nascent entrepreneur responses to Question 11b, which asked them how many entrepreneurial ideas they identified in the last year.

ENTREPRENEURIAL IDEAS FOR OFFLINE NASCENT ENTREPRENEURS: This was determined through offline nascent entrepreneur responses to Question 11b.

COMPARING NUMBER OF ENTREPRENEURIAL IDEAS FROM ONLINE AND OFFLINE-ONLY CONTACTS: This was determined for online nascent entrepreneurs through responses to Question 12b using a five point Likert scale of agreement that ranged from 5="Strongly Agree" to 1="Strongly Disagree," with 3 representing "Neither Agree/Disagree." The question asked for the online nascent entrepreneur level of agreement with the following statement, "I identify more entrepreneurial ideas using my online social network than my offline social network."

ASSOCIATION BETWEEN NUMBER OF ONLINE CONTACTS AND ENTREPRENEURIAL IDEAS IDENTIFIED FOR ONLINE NASCENT ENTREPRENEURS: This was determined through use of a Pearson and Spearman correlation tests and Linear Regression comparing the online contacts and number of entrepreneurial ideas identified in the last year for online nascent entrepreneurs.

4.6 Statistical Methods Used to Test Hypotheses

Statistical methods were selected based on levels of measurement. Data collected was matched against the test for statistical discrimination. Through statistical discrimination, the author determined the difference between and among the variables.

Hypothesis 1a: Nascent entrepreneurs who use an online social networking site communicate with a greater number of their contacts than nascent entrepreneurs who do not use a social networking site. The number of contacts communicated with by online nascent entrepreneurs was collected by adding responses from Questions 3a and 3b. The number of contacts communicated with for offline nascent entrepreneurs is collected from Question 3b. The *Test of*

Means was used to determine if the mean number of contacts for online were greater than the mean number of contacts for offline nascent entrepreneurs. A *t*-test was then used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 1b: Nascent entrepreneurs who use an online social networking site communicate with a greater number of their online contacts than with their offline-only contacts. The number of online contacts communicated with was collected through comparison of responses from Questions 3a and 3b for online nascent entrepreneurs. The *Test of Means* was used to determine if the mean number of contacts communicated with for nascent entrepreneur's using online social network sites were greater than the mean number of contacts communicated with for nascent entrepreneur's who do not use a social networking site. A *t*-test was then used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 2a: Nascent entrepreneurs who use an online social networking site exchange more information with their contacts than nascent entrepreneurs who do not use a social networking site. Information exchange for online nascent entrepreneurs was determined through the previously identified two step calculation process. The mean for all online and offline nascent entrepreneurs was then calculated. Each of the six points on the interval scale of agreement was transformed in order to create a proportion when multiplied with the number of online and offline contacts as shown in Table 6.

Table 6: Proportion Coding Key

Response	Original Coding	Transformed Code for Calculation
A Very Large Amount	6	1
A Large Amount	5	0.8
Some	4	0.6
Little	3	0.4
Very Little	2	0.2
None	1	0

This proportion enabled the researcher to take into account both the number of contacts and the respondent's stated level of information exchange. This was then compared with the mean for offline nascent entrepreneurs, which was calculated by multiplying their number of contacts by the Likert Scale of agreement response from Question 8b. For example, if one respondent had 100 contacts that they communicated with "Some" and another had 10 contacts that they communicated with at the same level, the amount of information exchanged should not be equal, since there is "some" information being exchange with 100 instead of 10. Using this scenario, 100 x 0.6 would equal 60, while 10 x 0.6 would equal 6. These numbers capture the proportion of information being exchanged based on the number of contacts and level of information exchange.

The *Test of Means* was used to determine if the information exchange means for online nascent entrepreneurs were greater than information exchange means for offline nascent entrepreneurs. A *t*-test was used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 2b: Nascent entrepreneurs who use an online social networking site exchange more information with their online contacts than with their offline-only contacts. Comparing information exchange between a nascent entrepreneur's online and offline contacts was determined through the same three step process as described in Hypothesis 2a. The *Test of Means* was used to determine if the online information exchange was greater than offline information exchange for online nascent entrepreneurs. A *t*-test was used to confirm the Test of Means results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 3a: Nascent entrepreneurs who use an online social networking site will identify more contacts they believe can help them with future business ventures than those that do not use an

online social network. The number of business contacts for online nascent entrepreneurs was collected by adding responses 5a and 5b. The number of business contacts for offline nascent entrepreneurs was collected from Question 5b. The *Test of Means* was used to determine if the mean number of online nascent entrepreneur business contacts were greater than the mean number of offline nascent entrepreneur business contacts. A *t*-test was used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 3b: Nascent entrepreneurs who use an online social networking site will identify more contacts that can help them with their business venture from their online contacts than from their offline-only contacts. The number of online business contacts was collected through responses from Question 5a and compared with responses from Question 5b for online nascent entrepreneurs. The *Test of Means* was used to determine if the mean number of online business contacts for were greater than the mean number of offline business contacts for online nascent entrepreneurs. A *t*-test was used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 3c: Nascent entrepreneurs who use an online social networking site will identify more entrepreneurial ideas than nascent entrepreneurs who do not use a social networking site. The number of entrepreneurial ideas that online and offline nascent entrepreneurs identify were collected through comparing online nascent entrepreneur responses to Question 11b with offline nascent entrepreneur responses to Question 11b. The *Test of Means* was used to determine if the mean number of entrepreneurial ideas for online nascent entrepreneurs were greater than the mean number of contacts for offline nascent entrepreneurs. A *t*-test was used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 3d: Nascent entrepreneurs who use an online social networking site will identify more entrepreneurial ideas from their online contacts than from their offline-only contacts. The number of entrepreneurial ideas that online nascent entrepreneurs identify were collected through responses to Question 12b. Responses were recorded on a 5-point Likert scale of agreement, with 5 representing "Strongly Agree," 3 representing "Neither Agree or Disagree," and 1 representing "Strongly Disagree." The *Test of Means* was used to determine if the mean number of entrepreneurial ideas online nascent entrepreneurs identified was more than 3.0 (since 3.0 represented neither agreement nor disagreement with the statement that they identify more entrepreneurial ideas using their online social network than their offline network). The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 3e: Nascent entrepreneurs who use an online social networking site will increase their level of business knowledge. The level of business knowledge for online nascent entrepreneurs was determined through responses to Question 7d. Responses were recorded on a 5-point Likert scale of agreement, with 5 representing "Strongly Agree," 3 representing "Neither Agree or Disagree," and 1 representing "Strongly Disagree." The *Test of Means* was used to determine if the mean online nascent entrepreneur response was more than 3.0 (since 3.0 represented neither agreement nor disagreement with the statement that their general business knowledge has increased since they began using an online social networking site). The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 4a: Nascent entrepreneurs who use an online social networking site will possess a larger number of weak ties than nascent entrepreneurs who do not use an online social networking site. The number of weak tie contacts possessed by online nascent entrepreneurs was determined by subtracting the total number of "very close" contacts (obtained by adding

responses from Question 6a and 6b) from the total number of contacts (obtained by adding responses from Questions 3a and 3b). Offline nascent entrepreneur weak ties were determined by subtracting responses from Question 6b from Question 3b. The *Test of Means* was used to determine if the mean number of weak tie contacts for online nascent entrepreneurs were greater than the mean number of contacts for offline nascent entrepreneurs. A *t*-test was then used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 4b: Nascent entrepreneurs who use an online social networking site will possess a larger number of strong ties than nascent entrepreneurs who do not use an online social networking site. The number of strong tie contacts possessed by online nascent entrepreneurs was collected by adding their responses from Question 6a and 6b. The number of strong tie contacts for offline nascent entrepreneurs was collected from Question 6b. The *Test of Means* was used to determine if the mean number of strong tie contacts for online nascent entrepreneurs were greater than the mean number of strong tie contacts for offline nascent entrepreneurs. A *t*-test was used to confirm the *Test of Means* results. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 4c: Nascent entrepreneurs who use an online social networking site will exchange more information with their online strong tie contacts than with their offline-only strong tie contacts. Comparison of information exchange between online and offline contacts for online nascent entrepreneurs was determined through responses to question 7b. Responses were recorded on a 5-point Likert scale of agreement, with 5 representing "Strongly Agree," 3 representing "Neither Agree or Disagree," and 1 representing "Strongly Disagree." The *Test of Means* was used to determine if the mean was more than 3.0 (since 3.0 represented neither agreement nor disagreement with the statement that they exchange more information with their "very close" online contacts than with their "very close" offline contacts). The statistical methods

chosen were considered most appropriate for this level of measurement and for these numerical responses.

Hypothesis 5: The number of contacts within a nascent entrepreneur's online network is positively related to the number of entrepreneurial ideas they identify. Online contacts for online nascent entrepreneurs were determined from Question 3a and the number of online entrepreneurial ideas was determined by responses to Question 11b. Both a Pearson Product Moment Correlation and Linear Regression was used to determine if the association between the number of contacts and number of entrepreneurial ideas identified. The statistical methods chosen were considered most appropriate for this level of measurement and for these numerical responses.

Chapter 5: Results and Research Findings

This section reports the research findings for this dissertation. It is separated into two sub-sections, descriptive statistics and test results of each hypothesis. Since correlation coefficients could not be computed when online and offline nascent entrepreneur factors were combined, each set was run separately. Table 7 provides the correlations for all offline nascent entrepreneurial factors and Table 8 provides correlations for all online factors.

The one item of note for offline nascent entrepreneurs was the moderate correlation found between the Strong Ties and Entrepreneurial Ideas factors, at .435 respectively. This correlation was almost entirely non-existent for online nascent entrepreneurs at .032. In fact, the weak ties of an online nascent entrepreneur are much more correlated, although it is still a weak one at .238, with entrepreneurial ideas than their strong ties. Perhaps the larger number of overall contacts for online nascent entrepreneurs, driven by the use of their online social networks, plays a factor in this.

Table 7: Offline Nascent Entrepreneur Factor Correlation Matrix

	Total Contacts	Total Info Exchange	Total Business Contacts	Entrepreneurial Ideas	Weak Ties	Strong Ties
Total Contacts	1.000					
Total Information Exchange	.920	1.000				
Total Business Contacts	.210	.241	1.000			
Entrepreneurial Ideas	.230	.242	.117	1.000		
Weak Ties	.983	.899	.196	.157	1.000	
Strong Ties	.471	.454	.149	.435	.299	1.000

Table 8: Online Nascent Entrepreneur Factor Correlation Matrix

	Total Contacts	Online Contacts	Offline Contacts	Online vs Offline Contacts	Total Information Exchange	Online Information Exchange	Offline Information Exchange	Total Business Contacts	Offline Business Contacts	Online Business Contacts	Entrep Ideas	Online vs Offline Entrep Ideas	Business Knowledge	Total Weak Ties	Online Weak Ties	Total Strong Ties	Online vs Offline Strong Tie Information Exchange
Total Contacts	1.000																
Online Contacts	.852	1.000															
Offline Contacts	.883	.628	1.000														
Online vs Offline Contacts	.310	.176	.017	1.000													
Total Information Exchange	.964	.911	.875	.030	1.000												
Online Information Exchange	.917	.950	.821	.054	.948	1.000											
Offline Information Exchange	.877	.817	.930	.000	.740	.799	1.000										
Total Business Contacts	.302	.180	.340	.039	.279	.193	.294	1.000									
Offline Business Contacts	.199	.087	.246	.007	.152	.098	.214	.872	1.000								
Online Business Contacts	.302	.193	.311	.049	.279	.199	.264	.930	.391	1.000							
Entrepreneurial Ideas	.241	.175	.206	.010	.187	.150	.192	.156	.087	.193	1.000						
Online vs Offline Entrep Ideas	.140	.087	.211	.111	.110	.084	.184	.182	.098	.204	.358	1.000					
Business Knowledge	.081	.085	.036	.071	.029	.035	.005	.133	.103	.116	.197	.044	1.000				
Weak Ties	.903	.848	.873	.123	.959	.911	.875	.277	.146	.277	.936	.089	.094	1.000			
Online Weak Ties	.849	.907	.423	.193	.907	.954	.847	.191	.078	.208	.877	.083	.098	.952	1.000		
Strong Ties	.125	.088	.091	.121	.100	.085	.270	-.025	-.018	-.023	.083	.080	.090	.115	.027	1.000	
Online vs Offline Strong Tie Information Exchange	.018	.001	.161	.215	.103	.075	.118	-.018	-.037	-.010	.006	.087	.000	.021	.021	.272	1.000

5.1 Descriptive Statistics

The age breakdown did reflect the large number of undergraduate students included in the survey sample. However, the inclusion of continuing education student provided a much broader age distribution than could have been expected if only undergraduate students were surveyed. Ages of those sampled fell roughly into thirds, with approximately one-third of all respondents between the ages of 18–27, another third between the ages of 28–47, and the final third ranging from 48 to more than 68. Since the age sample was fairly disbursed across the range, ages were segmented into six subgroups for analysis, each with a range of approximately 10 years. Table 9 provides the age breakdown of the sample.

Table 9: Age Breakdown

Age Group	Frequency (N)	Percent (%)
18–27	70	25%
23–32	55	10%
33–42	40	5%
43–47	30	11%
48–57	48	12%
58–68+	30	8%
No Response	9	3%
Total Sample (N)	282	100%

Table 10 shows that the race breakdown of the sample was not nearly as varied, with more than 70% of the respondents identifying as "Caucasian/White." Fifty of the respondents (18%) were marked "African American" while the next largest minority category selected was "Asian."

Table 10: Race Breakdown for Sample

Race	Frequency (N)	Percent (%)
African American	50	18%
Asian	17	6%
Caucasian/White	199	71%
Hispanic/Latino	9	3%
Other	6	2%
No Response	1	0%
Total Sample (N)	282	100%

The level of education was fairly diversified and is shown in Table 11. Respondents were allowed to mark only one of the education levels listed. Education levels were listed in order of perceived progression and respondents had to choose the highest level attained. For example, a two-year college degree was higher in rank than "Some College" and "Some Graduate School" was ranked higher than "Bachelor's Degree." Approximately 10% of the respondents had only a high school diploma or GED. Approximately one-fifth of those responding had a graduate degree and an additional 7% had 'Some Graduate School'

The largest segment was made-up of those having "Some College," while more than one quarter possessed either an Associate's or Bachelor's degree. In addition, more than one quarter of the respondents (27%) held some sort of professional licensure or certification.

Table 11: Level of Education

Level of Education	Frequency (N)	Percent (%)
High School	27	10%
GED	1	0%
Some College	88	31%
2 Year Degree	33	12%
4 Year Degree	40	14%
Some Graduate School	19	7%
Graduate School	53	19%
No Response	21	7%
Total Sample (N)	282	100%

Two key respondent characteristics for this study were the use or non-use of online social network sites and their self-identification as nascent entrepreneurs. Results in Table 12 and 13 provide a breakdown of the 282 respondents by these two characteristics, as well as those self-identifying as an entrepreneur.

Table 12: Use of Online Social Networks

Use OSN?	Frequency (N)	Percent (%)
Yes	196	70%
No	86	30%
Total Sample (N)	282	100%

Table 13: Entrepreneur Type

Entrepreneur Type	Frequency (N)	Percent (%)
Entrepreneur	64	22.7%
Nascent Entrepreneur	120	42.6%
Non Entrepreneur	98	34.8%
Total Sample (N)	282	100%

More than 64% of the total respondents self-identified as either an entrepreneur or nascent entrepreneur, with only 34.8% identifying as a non-entrepreneur. When combining online social network use and entrepreneur type, another important characteristic of this study is derived. The number of nascent entrepreneurs that use an online social network site were similar to those that did not, with 64 and 56 respectively. Table 14 breaks down online social network use by entrepreneur type. A majority of the respondents in each entrepreneur type category use online social network sites, indicating that online social network use continues to expand. When analyzing entrepreneurial type by online social network use, it is interesting to note that the largest percentage (by category) of non-online social network users is among the nascent entrepreneurial group.

Table 14: Online Social Network Use by Entrepreneurial Type

OSN Use by Type	Entrepreneur		Nascent Entrepreneur		Not Entrepreneur		Grand Total	
No	12	19%	56	47%	18	18%	86	30%
Yes	52	81%	64	53%	80	82%	196	70%
Grand Total	64	100%	120	100%	98	100%	282	100%

When examining the age (Table 15) and race (Table 16) breakdown of respondents in this sample, some interesting characteristics are visible. Although the 18–27 age category contained the largest number of nascent entrepreneurs (41%), the other age categories showed a fairly consistent percentage of nascent entrepreneurs. The entrepreneurial respondents were more evenly distributed through all of the age categories than the nascent entrepreneur respondents. The non-entrepreneurs showed a distribution similar to the nascent entrepreneurs.

As for race, the largest percentage of the respondents identified themselves as White, while the second largest percentage across all entrepreneur types was African American.

Table 15: Age by Entrepreneur Type

Age Groups	Entrepreneur		Nascent Entrepreneur		Not Entrepreneur		Grand Total	
18–27	14	22%	49	41%	36	37%	99	35%
28–37	8	13%	18	15%	15	15%	41	15%
38–47	13	20%	20	17%	22	22%	55	20%
48–52	16	25%	17	14%	15	15%	48	17%
58–68+	9	14%	16	13%	5	5%	30	11%
Unknown	4	6%	0	0%	5	5%	9	3%
Grand Total	64	100%	120	100%	98	100%	282	100%

Table 16: Race by Entrepreneur Type

Race by Type	Entrepreneur		Nascent Entrepreneur		Not Entrepreneur		Grand Total	
African American	13	20%	23	19%	14	14%	50	18%
Asian	3	5%	7	6%	7	7%	17	6%
Hispanic/Latino	1	2%	2	2%	6	6%	9	3%
White	46	72%	87	73%	66	67%	199	71%
Other	0	0%	1	1%	5	5%	6	2%
Unknown	1	2%	0	0%	0	0%	1	0%
Grand Total	64	100%	120	100%	98	100%	282	100%

Table 17 shows respondent breakdown by gender. Men were a large majority of each group in the sample, representing 58% of the nascent entrepreneurs, 73% of the entrepreneurs and 74% of the non-entrepreneurs.

Table 17: Gender by Entrepreneur Type

Gender by Type	Entrepreneur		Nascent Entrepreneur		Not Entrepreneur		Grand Total	
Male	47	73%	69	58%	73	74%	189	67%
Female	17	27%	51	43%	25	26%	93	33%
Grand Total	64	100%	120	100%	98	100%	282	100%

When analyzing the sample according to level of education (Table 18), the largest nascent entrepreneur category was "Some College" (28%), which is not surprising considering

the number of undergraduates surveyed. Overall, nascent entrepreneurs with a graduate degree made-up 13% of the sample, but the same group accounted for more than 38% of the entrepreneurs.

Table 18: Level of Education by Entrepreneur Type

Education Level by Type	Entrepreneur		Nascent Entrepreneur		Not Entrepreneur		Grand Total	
High School	4	6%	14	12%	9	9%	27	10%
GED	0	0%	0	0%	1	1%	1	0%
Some College	13	20%	33	28%	42	43%	88	31%
Two Year Degree	10	16%	14	12%	9	9%	33	12%
Four Year Degree	7	11%	15	13%	18	18%	40	14%
Some Graduate School	2	3%	12	10%	5	5%	19	7%
Graduate Degree	24	38%	15	13%	14	14%	53	19%
Unknown	4	6%	17	14%	0	0%	21	7%
Grand Total	64	100%	120	100%	98	100%	282	100%

The number of entrepreneurial ideas identified in the last year was a major component of this study. When analyzing the number of ideas by entrepreneur type from Table 19, it is interesting to note that the nascent entrepreneur group had a higher mean than the entrepreneur group. This could be due to the fact that entrepreneurs focus more of their energies on current ventures instead of new ones. This finding led the researcher to also breakdown the number of entrepreneurial ideas by age category for each entrepreneur type in Table 20.

Table 19: Entrepreneurial Ideas by Entrepreneur Type

Ideas by Type	Mean Ideas	Min Ideas	Max Ideas
Entrepreneur	3.9	0	20
Nascent Entrepreneur	4.9	0	30
Not Entrepreneur	1.7	0	20

Table 20: Entrepreneurial Ideas by Age Group

Type	Age Group	(N)	Mean Ideas	Min Ideas	Max Ideas
Entrepreneur	18–27	14	4.6	2	10
	28–37	8	4.6	0	15
	38–47	13	4.1	0	14
	48–57	16	3	0	20
	58–68+	9	2.7	0	6
	Unknown	4	5.5	0	10
Nascent Entrepreneur	18–27	49	7	0	30
	28–37	18	4.5	0	20
	38–47	20	3.1	1	20
	48–57	17	3.6	1	12
	58–68+	16	3	0	10
Non Entrepreneur	18–27	36	1.9	0	10
	28–37	15	3.2	0	20
	38–47	22	1.1	0	10
	48–57	15	0.9	0	12
	58–68+	5	2.8	0	10
	Unknown	5	0.6	0	1

Continuing the analysis by gender (Table 21) and race (Table 22) yields some unique results. Males generated, on average, almost twice as many ideas than females within the "Entrepreneur" type. Male and female nascent entrepreneurs were almost identical in the number of ideas they reported, 4.9 and 4.8 respectively. When analyzing by race, African Americans reported a larger mean of entrepreneurial ideas than Caucasian/Whites in the nascent entrepreneur category.

Table 21: Entrepreneurial Ideas by Gender

Entrepreneur Type	Gender	(N)	Mean Ideas	Min Ideas	Max Ideas
Entrepreneur	Male	47	5.8	0	20
	Female	17	3.2	0	14
Nascent Entrepreneur	Male	69	4.9	0	20
	Female	51	4.8	1	30
Not Entrepreneur	Male	73	3.3	0	20
	Female	25	1.2	0	10

Table 22: Entrepreneurial Ideas by Entrepreneur Type and Race

Entrepreneur Type	Race	(N)	Mean Ideas	Min Ideas	Max Ideas
Entrepreneur	African American	13	4.6	1	12
	Asian	3	1.3	0	2
	Hispanic/Latino	1	10.0	10	10
	White	46	3.6	0	20
	Unknown	1	10.0	10	10
Nascent Entrepreneur	African American	23	5.5	1	20
	Asian	7	2.6	0	10
	Hispanic/Latino	2	1.0	1	1
	White	87	5.0	0	30
	Other	1	3.0	3	3
Not Entrepreneur	African American	14	2.9	0	20
	Asian	7	0.4	0	2
	Hispanic/Latino	6	0.3	0	1
	White	66	1.6	0	12
	Other	5	0.6	0	1

When analyzing the number of entrepreneurial ideas by type and level of education (Table 23), it is interesting to note that those with only a high school education consistently reported either the highest or second highest mean number of ideas in each entrepreneur type.

Table 23: Entrepreneurial Ideas by Type and Level of Education

Type	Level of Education	Mean Ideas	Min Ideas	Max Ideas
Entrepreneur	High School	8.0	2	10
	Some College	3.8	1	12
	Two Year Degree	3.5	0	15
	Four Year Degree	4.7	1	20
	Some Grad. School	9.0	4	14
	Graduate Degree	2.5	0	10
	Unknown	5.0	0	14
Nascent Entrepreneur	High School	7.1	0	30
	Some College	5.1	0	20
	Two Year Degree	4.9	1	12
	Four Year Degree	3.9	1	11
	Some Grad. School	3.7	0	13
	Graduate Degree	4.5	0	20
	Unknown	4.6	1	20
Not Entrepreneur	High School	2.7	0	10
	GED	0.0	0	0
	Some College	1.9	0	20
	Two Year Degree	1.3	0	5
	Four Year Degree	1.1	0	4
	Some Grad. School	3.0	0	10
	Graduate Degree	1.4	0	12

When evaluating the number of entrepreneurial ideas reported by entrepreneur type and use of an online social network, it is notable that the mean number of entrepreneurial ideas identified for online nascent entrepreneurs is almost double that of offline nascent entrepreneurs. In addition, the online nascent entrepreneur group reported both a mean and maximum number of ideas larger than the other groups.

Table 24: Entrepreneurial Ideas by Type and Use of Online Social Network

Type	Use OSN	(N)	Mean Ideas	Min Ideas	Max Ideas
Entrepreneur	No	12	4.0	0.0	14.0
	Yes	52	3.8	0.0	20.0
Nascent Entrepreneur	No	56	3.3	0.0	20.0
	Yes	64	6.2	0.0	30.0
Not Entrepreneur	No	18	1.3	0.0	12.0
	Yes	80	1.8	0.0	20.0

5.2 Hypotheses Test Results

The first hypothesis theorized that nascent entrepreneurs who use online social network sites will communicate with a greater number of their contacts than those that do not use online social network sites.

> Hypothesis 1a: Nascent entrepreneurs who use an online social networking site communicate with a greater number of their contacts than nascent entrepreneurs who do not use a social networking site.

The *t*-test results in Table 25 show that the mean number of contacts communicated with for online nascents was slightly more than 328.6 while for offline nascents it was slightly more than 33.2. This difference was statistically significant at the $p<.001$ level. The standard deviation for both is quite large, but they are consistent in relation to their respective means.

Table 25: Hypothesis 1a *t*-Test

	N	Mean***	Std. Deviation
Online Nascent Total Contacts	64	328.61	285.06
Offline Nascent Total Contacts	56	33.23	26.93

***Significant difference at $p<.001$

Results show strong support for the difference in means. The statistical results show strong support for accepting Hypothesis 1a.

The second hypothesis theorized that nascent entrepreneur who use online social network sites will communicate with a greater number of their online contacts than with their offline contacts.

> Hypothesis 1b: Nascent entrepreneurs who use an online social networking site communicate with a greater number of their online contacts than with their offline-only contacts.

The *t*-test results in Table 26 show that the mean number of online contacts communicated with was 249 while offline contacts communicated with was 79.6. This difference was statistically significant at the $p<.001$ level. The standard deviation for both was quite large, with the standard deviation for offline contacts larger in relation to its mean.

Table 26: Hypothesis 1b *t*-Test

	N	Mean***	Std. Deviation
Online Nascent Online Contacts	64	249.02	230.39
Online Nascent Offline Contacts	64	79.59	96.10

***Significant difference at $p<.001$

Results show strong support for the difference in means. The statistical results show strong support for accepting Hypothesis 1b.

The third hypothesis theorized that nascent entrepreneurs who use online social network sites will exchange more information with their contacts then those that do not use online social networks.

> Hypothesis 2a: Nascent entrepreneurs who use an online social networking site exchange more information with their contacts than nascent entrepreneurs who do not use a social networking site.

The *t*-test results in Table 27 show that the online nascent entrepreneur information exchange mean was 191.1 compared to the offline nascent entrepreneur information exchange mean of 19.7. This difference was statistically significant at the $p<.001$ level. The standard deviation for each was large, but they were in proportion to one another.

Table 27: Hypothesis 2a *t*-Test

	N	Mean***	Std. Deviation
Online Nascent Information Exchange	64	191.11	188.83
Offline Nascent Information Exchange	56	19.67	21.13

***Significant difference at $p<.001$

Results show strong support for accepting Hypothesis 2a, that online nascent entrepreneur exchange more information with their contacts than offline nascent entrepreneurs with their contacts.

The fourth hypothesis theorized that nascent entrepreneurs who use online social network sites will exchange more information with their online contacts than with their offline contacts.

> Hypothesis 2b: Nascent entrepreneurs who use an online social networking site exchange more information with their online contacts than with their offline-only contacts.

The *t*-test results in Table 28 show that the online information exchange mean was 139.4 compared to the offline information exchange mean of 51.7. This difference was statistically significant at the $p<.001$ level. The standard deviation for each was large, but they were in proportion to one another.

Table 28: Hypothesis 2b *t*-Test

	N	Mean***	Std. Deviation
Online Contact Info Exchange	64	139.40	146.91
Offline Contact Info Exchange	64	51.72	69.78

***Significant at $p<.001$

This test confirmed that much more information was exchanged with online contacts than with offline contacts. The results show strong support for accepting Hypothesis 2b.

The fifth hypothesis theorized that nascent entrepreneurs who use online social network sites will identify more business contacts than those that do not use an online network site.

> Hypothesis 3a: Nascent entrepreneurs who use an online social networking site will identify more contacts they believe can help

them with future business ventures than those that do not use an online social network.

The *t*-test results in Table 29 show that the mean number of business contacts for online nascent entrepreneurs was 34.6 while offline business contact mean was 5.5. This difference was statistically significant at the $p<.001$ level. The standard deviation for both items was quite large.

Table 29: Hypothesis 3a Means Testing

	N	Mean***	Std. Deviation
Online Nascent Business Contacts	64	34.63	53.96
Offline Nascent Business Contacts	56	5.52	13.72

***Significant difference at $p<.001$

Results provide strong support for accepting Hypothesis 3a

The sixth hypothesis theorized that online nascent entrepreneurs will identify more business contacts from their online contacts than from their offline contacts.

> Hypothesis 3b: Nascent entrepreneurs who use an online social networking site will identify more contacts that can help them with their business venture from their online contacts than from their offline-only contacts.

The *t*-test results in Table 30 show that the mean number of online business contacts was 22.1 while offline business contact mean was 12.5. This difference was statistically significant at the $p<.001$ level. The online business contact mean was larger and both had a large standard deviation in proportion to each other's mean.

Table 30: Hypothesis 3b *t*-Test

	N	Mean***	Std. Deviation
Online Business Contacts	64	22.14	42.71
Offline Business Contacts	64	12.48	21.17

***Significant difference at $p<.001$

Results do indicate statistical support for accepting Hypothesis 3b.

The seventh hypothesis theorized that nascent entrepreneurs who use online social network sites will identify more entrepreneurial ideas than nascent entrepreneurs that do not use an online social network site.

> Hypothesis 3c. Nascent entrepreneurs who use an online social networking site will identify more entrepreneurial ideas than nascent entrepreneurs who do not use a social networking site.

The *t*-test results in Table 31 show that the mean number of entrepreneurial ideas for online nascent entrepreneurs was significantly larger than for offline nascent entrepreneurs, 6.2 compared with 3.3 respectively. This difference was statistically significant at the $p < .001$ level

Table 31: Hypothesis 3c *t*-Test

	N	Mean***	Std. Deviation
Online Nascent Entrepreneurial Ideas	64	6.19	5.532
Offline Nascent Entrepreneurial Ideas	56	3.32	4.032

***Significant difference at $p<.001$

Results show support for accepting Hypothesis 3c. As a further test of the hypothesis, a Hierarchical Regression Analysis was conducted. Entrepreneurial ideas were first regressed against age and education, then on online information exchange, and finally upon online nascent entrepreneur offline information exchange to determine if any of these factors could be used to predict the number of entrepreneurial ideas identified. The results are shown in Table 32. None of the models showed significance.

Table 32: Regression Results for Online and Offline Information Exchange, Age, and Level of Education Impact on Entrepreneurial Ideas

Variable	Model 1 Beta	Model 2 Beta	Model 3
Age	-.255	-.230	-.244
Education	.019*	.017*	.049
Online Information Exchange		.058	-.014
Offline Information Exchange			.162
F	1.952	1.344	1.336
Adjusted R Square	.029	.016	.021
Change in R from Model 2			-.013
Change in R from Model 3			.005

Significant at $p<.05$

The eighth hypothesis theorized nascent entrepreneurs who use online social network sites will identify more entrepreneurial ideas from their online contacts than from their offline contacts.

> Hypothesis 3d. Nascent entrepreneurs who use an online social networking site will identify more entrepreneurial ideas from their online contacts than from their offline-only contacts.

The means testing results in Table 33 show a mean of 3.14 and a standard deviation of 1.02, which places responses firmly around the number "3". The list of responses in Table 34 show that 15 responses were below "3", indicating disagreement or strong disagreement, and 25 were above "3", indicating agreement or strong agreement.

Table 33: Hypothesis 3d Test of Means

	N	Mean	Std. Deviation
Online Nascent – Online vs Offline Entrepreneurial Ideas	64	3.14	1.02

Table 34: Hypothesis 3d Response List

	Observed N	Expected N	Residual
1	4	13.0	-9.0
2	11	13.0	-2.0
3	24	13.0	11.0
4	21	13.0	8.0
5	4	13.0	-9.0
Total	64		

Results were mixed. the mean indicates that respondents generally neither agree nor disagree with the previously identified statement. However, the largest number of respondents (25) either "Agreed" or "Strongly Agreed" with the statement. Only 15 either "Disagreed" or "Strongly Disagreed," while 24 "Neither Agreed nor Disagreed." Results were inconclusive for Hypothesis 3d. However, Table 34 does show that when "agree/strongly agree" responses are combined, they represent the largest response group. When the 24 "neither agree/disagree" responses are added to the "agree/strongly agree" responses, more than 76% of the

respondents, 49 out of 64 respectively, did not disagree that they identified more ideas from their online network.

The ninth hypothesis theorized that nascent entrepreneurs who use online social network sites will increase their level of business knowledge.

> Hypothesis 3e: Nascent entrepreneurs who use an online social networking site will increase their level of business knowledge.

This was a single item measure based on responses to a 5-point Likert scale of agreement. A "3" in the results is an indicator that the respondents neither agreed nor disagreed with the statement that, "Since I began using my online social network, I have increased my general business knowledge." The means testing results in Table 35 show that the mean response was 3.11 with a standard deviation of 1.11. The list of responses in Table 36 show that 26 responses were above the mean and 15 below it. The two largest response categories, by a significant margin, are "3" (Neither Agree/Disagree) and "4" (Agree).

Table 35: Hypothesis 3e Test of Means

	N	Mean	Std. Deviation
Online Nascent Business Knowledge	64	3.11	1.11

Table 36: Hypothesis 3e Response List

	Observed N	Expected N	Residual
1	9	13.0	-4.0
2	6	13.0	-7.0
3	23	13.0	10.0
4	22	13.0	9.0
5	4	13.0	-9.0
Total	64		

Results were mixed, the mean indicates that respondents generally neither agreed nor disagreed with the previously identified statement. However, the largest number of respondents (26) either "Agreed" or "Strongly Agreed" with the statement. Only 15 either "Disagreed" or "Strongly Disagreed," while 23 "Neither Agreed or Disagreed." Results were inconclusive for Hypothesis 3e. However, Table 36 does show that when 'agree/strongly agree' responses are

combined, they represent the largest response group, with a total of 26 respectively. When the 23 'neither agree/disagree' responses are added to the "agree/strongly agree" responses, more than 76% of the respondents, 49 out of 64 respectively, did not disagree with the statement that "since they began using their online social network site, they have increased their level of business knowledge."

The tenth hypothesis theorized that nascent entrepreneurs who use online social network sites will possess a larger number of weak ties than those that do not use an online social network site.

> Hypothesis 4a: Nascent entrepreneurs who use an online social networking site will possess a larger number of weak ties than nascent entrepreneurs who do not use an online social networking site

The *t*-test results in Table 37 show that the mean number of weak ties for online nascent entrepreneurs was 295 while for offline nascent entrepreneurs it was 27. The difference was statistically significant at the $p<.001$ level. Both have a rather large standard deviation, but they are consistent in relation to their respective means.

Table 37: Hypothesis 4a *t*-Test

	N	Mean***	Std. Deviation
Online Nascent Weak Ties	64	295.45	272.25
Offline Nascent Weak Ties	56	26.88	24.90

***Significant difference at $p<.001$

These results show strong statistical support for accepting Hypothesis 4a.

The eleventh hypothesis theorized that nascent entrepreneurs who use online social network sites will possess a larger number of strong ties than those that do not use an online social network site.

> Hypothesis 4b: Nascent entrepreneurs who use an online social networking site will possess a larger number of strong ties than nascent entrepreneurs who do not use an online social networking site

The *t*-test results in Table 38 show that the mean number of contacts communicated with by online nascent entrepreneurs was 33 while it was 6.3 for offline nascent entrepreneurs. The

difference was statistically significant at the $p<.001$ level. The standard deviation for both is quite large, but they are consistent in relation to their respective means.

Table 38: Hypothesis 4b *t*-Test

	N	Mean***	Std. Deviation
Online Nascent Strong Ties	64	33.16	34.35
Offline Nascent Strong Ties	56	6.36	5.22

***Significant difference at $p<.001$

These statistical results show strong support for accepting Hypothesis 4b.

The twelfth hypothesis theorized that nascent entrepreneurs who use online social network sites will exchange more information with their online contacts than with their offline contacts.

> Hypothesis 4c: Nascent entrepreneurs who use an online social networking site will exchange more information with their online strong tie contacts than with their offline-only strong tie contacts.

This was a single item measure based on responses to a 5-point Likert scale of agreement. A "3" in the results is an indicator that the respondent neither agreed nor disagreed with the statement that, "they exchange more information with their very close online contacts than with their very close offline contacts." The means test results in Table 39 show that the mean response was 2.84, with a standard deviation of 1.22. A list of responses in Table 40 show that 27 responses were below the mean and 24 above it. The two largest response categories were "2" (disagree) and "4" (agree).

Table 39: Hypothesis 4c Test of Means

	N	Mean	Std. Deviation
Online Strong Ties vs Offline Strong Ties Information Exchange	64	2.84	1.22

Table 40: Hypothesis 4c Response Listing

	Observed N	Expected N	Residual
1.00	11	12.8	-1.8
2.00	16	12.8	3.2
3.00	13	12.8	.2
4.00	20	12.8	7.2
5.00	4	12.8	-8.8
Total	64		

The interval is closer to "3" than "2". This, combined with the response listings indicates that although respondents generally neither agree nor disagree, they are more likely to disagree than agree. Results are inconclusive for Hypothesis 4c.

The thirteenth and final hypothesis theorized that the number of online contacts for online nascent entrepreneurs was positively related to the number of ideas they recognized.

> Hypothesis 5: The number of contacts within a nascent entrepreneur's online network is positively related to the number of entrepreneurial ideas they identify.

A means for online nascent entrepreneurial total contacts and entrepreneurial ideas are shown in Table 41. A Pearson Product Moment Correlation was conducted to determine if any correlation or association existed between the factors, with results in 42. The Pearson results show no significance at the $p < 0.05$.

Table 41: Hypothesis 5 Means Testing

	Mean	Std. Deviation	N
Online Nascent Total Contacts	249.02	230.39	64
Online Nascent Entrepreneurial Ideas	6.19	5.53	64

Table 42: Hypothesis 5 Pearson Correlations

		Contacts	Ideas
Online Contacts	Pearson Correlation	1	.175
	Sig. (2-tailed)		.167
Entrepreneurial Ideas	Pearson Correlation	.175	1
	Sig. (2-tailed)	.167	

As a further test of the hypothesis, a Hierarchical Regression Analysis was conducted. Entrepreneurial ideas were then regressed against weak ties, strong ties, online business contacts, and offline business contacts to determine if any of these factors could be used to predict the number of entrepreneurial ideas identified. Results are in Table 43. None of the models showed significance.

Table 43: Regression Results for Weak Tie, Strong Tie, Online and Offline Business Contacts Influence on Entrepreneurial Ideas Identified

Variable	Model 1 Beta	Model 2 Beta	Model 3 Beta
Weak Ties	.253	.225	.224
Strong Ties	-.049	-.038	-.037
Online Business Contacts		.089	.081
Offline Business Contacts			.024
F	1.904	1.414	1.052
Adjusted R Square	.028	.019	.003
Change in R from Model 2			.008
Change in R from Model 3			.016

Chapter 6: Discussion

This section includes a discussion of the results, implications, and limitations of this study. It begins by describing how this study expands on Davidsson and Honig's (2003) work concerning the importance of social networks, by including the impact of online social networks. Next, a glimpse into how dramatically online social network use has increased over the last few years is provided. The general discussion is grouped into three parts, the first reviews and provides a discussion of the implications of supported results, the second does the same for inconclusive results, and the third provides a discussion on the broader impact of this study. The limitations of this study are then discussed, along with identification and discussion of possible future research directions.

Individuals use online social network sites for a variety of reasons, from leveraging a more dynamic medium for day-to-day communications to finding long lost friends. Carter (2005) found that online virtual communities share many characteristics with face-to-face communities and that these Internet-based relationships quickly become part of the daily routine, which was supported in this study. Although networking is not necessarily the goal, use of online social network sites results in connections with individuals that would not otherwise have been made, and sometimes communications with these connections continue offline (Haythornthwaite, 2005), meaning that online social network sites can also be an important facilitator for off-line communication, which appeared to be supported by the survey data. While not specifically tested for this study, survey data was collected regarding contacts that were part of both the respondent's online and offline network. Survey results showed that approximately one-third of a respondent's online contacts were also offline contacts, with 205 online contacts and 67 online/offline contacts on average.

Although Haythornthwaite (2001) discussed the social consequences of Internet use, most of the current research focuses on specific components of virtual communities (Hersberger Murray & Rioux, 2007). This dissertation study extends this research to demonstrate the positive consequences of online social network use for entrepreneurs in the future, allowing them to

maintain a larger number of contacts, exchange more information, and identify more entrepreneurial ideas than would otherwise be possible using offline networks alone.

In their 2003 study, Davidsson and Honig (2003) made three arguments that are relevant to this study: (1) entrepreneurs should develop and promote all sorts of networks, (2) changes and advances in communication technologies increase the feasibility that entrepreneurs can work in distant and autonomous environments, and (3) it would be prudent for nascent entrepreneurs to promote and develop social network capabilities. Davidsson and Honig were not aware of online social networks as they currently exist since the form and function of online social networks did not take shape until 2004 (Parameswaran & Whinston, 2007). However in retrospect, their findings seem to point to the advent and use of these online networks by nascent entrepreneurs and this study strongly supports their arguments.

At the time work on this dissertation began, there was little research conducted concerning the influence of online social network sites on the entrepreneurial identification process. At the genesis of this research project in 2008, statistics indicated that online social network sites were a tool adopted by a large number of college-aged, young adults and were beginning to gain acceptance by older adults. The research focus was on nascent entrepreneurs since the researcher believed there would be great difficulty identifying and collecting data from entrepreneurs that use online social network sites.

By the time data collection began in late 2009, it was apparent that more and more adults were using these sites, so the researcher included entrepreneur-focused questions to capture this data. To increase the likelihood of collecting entrepreneur data, the researcher sampled both undergraduate and adult continuing education students at Maryland community colleges. This approach led to an expanded data collection emphasizing a larger age range of respondents than would have been possible by sampling only undergraduates. In the end, not only was the sample of nascent entrepreneurs and entrepreneurs using online social network sites large enough, but the ironic result was that it became more difficult to collect data on those that did not use them.

To further support this finding, the researcher visited Facebook's corporate statistics page at http://www.facebook.com/press/info.php?statistics, since Facebook was used by more than 95% of the respondents in this study. Some statistical highlights from this visit on March 24th, 2010, include the following.

More than 400 million active users
50% of Facebook users log on daily
More than 5 billion pieces of content shared weekly
Those above the age of 35 are the fastest growing segment
More than 100 million users log in to their site via a mobile device
Those that use Facebook on their mobile device log in twice as often

These statistics provide strong indication that online social network use will continue to expand and that for a large number of people, use of online social networks is becoming part of their daily communication routine.

In summary, there were thirteen hypotheses identified as part of this study. Eight of the hypotheses were either supported or strongly supported, one was weakly supported, and the results for four were inconclusive.

Implications of Supported Results

Entrepreneurs tend to imbed their business decisions in social structures and the link between entrepreneurs and their use of social network has been widely researched (Borch, 1994; Greve & Salaff, 2003; Hansen, 1995; Larson & Starr, 1993; Reynolds, 1991; Singh, 2000; Starr & MacMillan, 1990). This study extends the link between entrepreneurs and their social networks to the use of online social networks. Online nascent entrepreneurs demonstrated a link between business decisions and social structures as shown through their increased number of business contacts as compared to offline nascent entrepreneurs (Hypothesis 3a). Entrepreneurs also tend to have well established social networks, using them to obtain and generate business ideas (Brown & Butler, 1995) and to get advice and resources to launch a business (Granovetter, 1985, 1992). The increased number of total contacts for online nascent entrepreneurs found in this study also seems to support this previous research.

Grossman (2005) found that at the earliest stages of new venture creation, many entrepreneurs value network connections more than the resources that might be secured via those contacts. As nascent entrepreneurs work through the discovery process, they make extensive use of their network of friends and acquaintances or in other words, their social capital. This social capital helps to expose them to varying ideas and views, providing a wider frame of reference and support for new business ideas (Aldrich et al., 1998; Aldrich & Zimmer, 1986). The large number of online contacts and increased information exchange as compared to offline nascent entrepreneurs found in this study seems to demonstrate improved access to this social capital. The immediate access to so many individuals through use of online social networks may impact how these networks are accessed and the way in which ideas and knowledge are exchanged within a network.

Online social networks provide many tools that allow nascent entrepreneurs to communicate more content, more quickly and more often than is possible in traditional network, thereby allowing them to create and maintain more social capital. One example of this is use of a Facebook Wall. All friends that have been given permission by a particular user can not only post their random thoughts/comments on the wall of an intended friend, but all friends of that intended friend can see the thoughts/comments as well.

The researcher recently experienced the power of this capability. A pending high school reunion motivated someone to post a senior picture, which contained all members from the class, on their own wall. Within two days, 57 different people had made 127 comments regarding the picture, which generated conversation strings on various topics that lasted more than 30 days. From that posting, the author began a conversation that led to a consulting opportunity from someone they had not spoken with for more than 20 years.

Although just one example, it is the ability to expand one's social capital with little effort or capital expense, that may be the single most important aspect of online social networks. This is consistent with Davidsson and Honig's (2003) suggestion that advances in communication technologies will enable entrepreneurs to better develop and promote their network capabilities.

Davidsson and Honig (2003) also found that social capital can be an important predictor of who will elect to become a nascent entrepreneur and the overall pace of the nascent entrepreneurial process, which was also supported through results of this study. Their findings, which are strongly supported by this research, also suggest that actively pursuing, developing, and maintaining social relations are a more important predictor of success than taking business classes (Davidsson & Honig, 2003).

Although this study did not compare social relations against taking business classes, it did provide some support for the notion that social capital can be more important than obtaining a college education. This study found that the level of education has little impact on the idea identification process. Nascent entrepreneurs and entrepreneurs with only a high school education were found to identify just as many or more ideas than those with advanced (bachelors and graduate) degrees. Now, this is no guarantee of business success, but it does provide insight into the power of social capital in recognizing entrepreneurial ideas.

According to Ko and Butler (2006), social networks, a solid knowledge base, and a firm commitment to remaining alert are primary antecedent elements important to entrepreneurial creativity. Based on results from this study, the use of online social networks, with their instantaneous access to multiple information sources and ability to facilitate collaboration of information and ideas, appear to increase entrepreneurial creativity, at least in the form of idea identification, which is an important part of the opportunity recognition process.

Access and attainment of appropriate information plays a critical role in opportunity recognition (Gaglio & Katz, 2001; Kaish & Gilad, 1991; Shane, 2003), and this study postulated that the unique capabilities inherent to online social network sites would enhance a nascent entrepreneur's ability for idea identification or at the very least, increase the number of possible opportunities that nascent entrepreneurs would be exposed to. Findings support this postulation, with nascent entrepreneurs using online social networks to exchange in more information exchange with their contacts (Hypothesis 2a), possessing a larger number of online business

contacts than offline business contacts (Hypothesis 3b), and ultimately identifying more opportunities than those that do not use online social network sites (Hypothesis 3c).

Bridging social capital is related to one's ability to maintain and develop weak ties and online social networks may influence this differently than traditional social networks. Online social networks enable individuals to transfer friends from offline to online social networks and allow an individual contact with a large number of acquaintances (Steinfield et al., 2008; Subrahmanyam, Reich, Waechter & Espinoza, 2008). This ability to broadcast information while simultaneously monitoring the activities of others creates a solid infrastructure for social interaction that cannot be matched in offline networks (Steinfield et al., 2008). The increased amount of information exchange, larger number of online contacts, and larger number of weak ties reported by online nascent entrepreneurs in contrast to offline nascent entrepreneurs supports this research, while the associated number of entrepreneurial ideas associated with online nascent entrepreneurs helps to extend this research more specifically into the field of entrepreneurship.

Granovetter (1973) advocated maintaining an extensive network of weak ties since a majority of the novel information within a network is transmitted through these weak tie exchanges (Granovetter, 2004). Nascent entrepreneurs derive ideas and information through exchanges with weak ties, but when an action requires confirmation from multiple sources it is expected that strong ties will be contacted. Before conducting this study, the researcher was not sure if the strong tie contacts needed for confirmation would reside within the nascent entrepreneur's online network. However, results show that not only do online nascent entrepreneurs identify and maintain a larger number of weak ties overall (Hypothesis 4a), but they also maintain a larger number of strong ties (4b) than those that do not use an online social network.

Constructing the initial resource base in any new venture requires resource identification, acquisition, and assembly in order take advantage of a perceived opportunity (Brush et al., 2001). The use of online social networks may provide nascent entrepreneurs the ability to quickly identify and assemble these unique resource combinations. Social relations can act as the focal point for

both where and how this knowledge is created (Colarelli O'Connor & Rice, 2001; Elfring & Hulsink, 2003; Julien & Vaghely, 2001). Puhakka (2006) found that the amount of social interaction does positively affect knowledge acquisition, finding that a wide base of relations is not only used to obtain new information, but to better visualize possible future developments. This study tried to extend this concept and determine if the number of online contacts was positively related to the number of entrepreneurial ideas identified.

This study found that nascent entrepreneurs using online social network sites did report more entrepreneurial ideas than those that did not (Hypothesis 3c), supporting the belief that the use of an online social network does provide additional support for idea identification. However, this study did not provide conclusive evident for supporting the positive link between the number of online contacts and idea recognition (Hypothesis 5), which was only weakly supported in this study. It may be that the combination of both online and offline network factors is what leads to increased idea identification. Results from this study demonstrate that more entrepreneurial ideas are identified by those using online social networks, but it is still unclear what combination of online factors truly influence this increase in idea identification.

Another finding from this study was that age and level of education did not impact results. Increases in the various contact categories (total, online, business contacts, weak/strong ties) and information exchanged were consistent across age and education categories. This speaks both to the recent expansion of online networks into older age groups and the universal impact of the tools and capabilities of these online networks. Overall, this study has expanded the applicability of previous research from traditional social networks to online networks. Nascent entrepreneurs who use online social network sites communicate with more contacts (Hypothesis 1a), communicate with more online than offline contacts (Hypothesis 1b), have a larger number of business contacts (Hypothesis 3a), have a larger number of weak and strong ties (Hypotheses 4a, 4b) and identify more entrepreneurial ideas than those that do not use online social network sites (Hypothesis 3c).

Inconclusive Results

Three of the four hypotheses with inconclusive results were meant to extend previous hypothesized findings. While results supported the idea that those using an online social network exchange more information with their contacts than those that do not use one, Hypothesis 2b postulated that more information would be exchanged with online contacts than with offline contacts. While results were inconclusive, they did hint at positive results for this hypothesis. Comparison of information exchange between online and offline strong ties was the focus of Hypothesis 4c and the results for this hypothesis were also inconclusive. Hypothesis 3d postulated that more ideas would be identified from online contacts than from offline contacts. Again, results were inconclusive, but leaned towards positive results. An increased level of business knowledge was also postulated to result from online social network use (Hypothesis 3e). The results were weaker for this hypothesis than for the other three.

A key factor in these results could have been the wide range of online social network use. Interviews with the pre-test respondents revealed a variety of approaches to the use of these networks, from a glorified contacts-management source to a vital part of their own daily communications strategy. Some of these differences in use were a result of personal preference, but "newness of the tool" may have also contributed. This newness of the tool may have contributed to the lack of a fully developed sense of all that it is capable of. Newness of the online social network tools combined with the wide variety of uses for these online social networks may have made it difficult for respondents to distinguish their online network's direct impact on the areas surveyed. For instance, although respondents were not sure about whether they identified more entrepreneurial ideas from their online or offline contacts, results show that those using online social network sites did identify more ideas than those that did not use them. Perhaps as users become more mature in the use and capabilities of these online tools, understanding and perceptions of their benefits will become clearer.

The inconclusive results may have been alleviated by the use of an even numbered scale of agreement that prevented a "Neither Agree/Disagree" response. In fact, the developing

maturity surrounding online social network use did inadvertently surface during discussions with the pilot study group around the use of 5-point Likert scale measures. Since the focus of the pilot study group was to develop a better survey instrument, general questions on views concerning the use of online social networks were not specifically asked. However, when ascertaining members' views on use of the five-point interval scale of agreement, some specifically advocated for keeping it a five-point scale of agreement because they "weren't sure whether they agreed or not" and the "Neither Agree/Disagree" option should remain to accurately capture their response.

Upon reflection, perhaps another question should have been added to the survey to capture this data or a move to an even interval scale should have been made. Although the inconclusive findings for these four hypotheses were disappointing, none of them were rejected. This shows that nascent entrepreneurs do make some distinction between their online and offline social networks concerning information exchange, entrepreneurial idea identification, and business knowledge.

Broader Implications

Entrepreneurship involves the discovery, creation, and use of opportunities aimed at the introduction of new goods and services, new ways of organizing, or new processes (Shane & Venkataraman, 2000; Venkataraman, 1997). Results from this study seem to indicate that many within the next generation entrepreneurs, represented by the nascent entrepreneurs surveyed for this study, will use online social networking sites to communicate with their contacts.

Each year millions more people sign-up and use these online social networking sites and the field of entrepreneurship must take into account the impact of this widespread adoption. While the researcher does not believe online social networks can or will ever replace traditional face-to-face and telephone interaction, results from this study do indicate that online social network use seems to enhance and compliment traditional social network communication while also providing a conduit for the establishment of new contacts.

Within the introduction of this dissertation, the researcher asked how the widespread adoption and use of online networking websites might change the way in which entrepreneurs generate ideas and start new ventures. It has already been found that online social networking sites have changed the way that many individuals communicate and socialize (Davis, 2007), but this study extends the research by beginning the process of identifying specific ways in which entrepreneurs may leverage these online social networks in the future. It has already been established that entrepreneurs tend to collect ideas and information and then construct them into opportunity by using social networks (Puhakka, 2006) and that they embed the formation and growth of their business in social structures (Aldrich & Zimmer, 1986; Birley, 1985; Greve & Salaff, 2003). This study leads future researchers to include the online social network component to these findings, since results show some significant differences between nascent entrepreneurs that use online social networks and those that do not.

Widespread adoption of the Internet in many countries has eliminated the costly technical infrastructure usually required to send or receive information to large numbers of people (Gruhl et al., 2004). More recent support for this argument was easily found on the press page of Facebook's website (http://www.facebook.com/press/info.php?statistics), where it reported that of March 2010 approximately 70% of its 400 million users live outside the United States. Online social networks leverage this low cost infrastructure to support enhanced communication capabilities, capabilities that nascent entrepreneurs seem to be taking advantage of to share more information, more quickly, and to larger numbers of contacts than is possible in offline social networks. Those nascent entrepreneurs that used online social networks not only had more contacts (including business contacts, and strong and weak tie contacts), but also exchanged more information and self-reported the identification of more entrepreneurial ideas.

This low cost capability to communicate more frequently with more contacts will only continue to expand through the growing use of PDAs and mobile phones to access online networks, minimizing the need to be connected through a computer. According to Facebook, those accessing their sites through a mobile device log on twice as much as those accessing

through their computers. Perhaps the almost instantaneous access to these online social networks will impact the field of anthropology as well. Although not a focus of this study, the previously argued threshold of 150 social relations that an individual will limit themselves to (Howard, 2008) may be called into question. Nascent entrepreneurs with larger numbers of contacts did recognize more entrepreneurial ideas and maintained larger numbers of business contacts. Although the level of relationship with these contacts was not measured outside of their categorization as a weak or strong tie, results seem to indicate that larger numbers of online contacts can positively influence the number of business contacts, entrepreneurial ideas, and amount of information exchange.

The concept of information sharing has exploded with the growth of online social network sites. Although older technologies and methods allowed communication over long distances, either their delayed response between message deliver and receipt (mail) or cost (telephone) were prohibitive. Face-to-face and telephone conversations have trouble matching the media richness and contextual knowledge provided online by the combination of pre-produced content (music, video, podcasts) distributed through file sharing and near instantaneous collaboration through instant messaging or voice conversations using products like Skype.

New technical capabilities will likely continue to quicken and broaden the nature of information sharing. For example, new features like *news feeds* radically reduce the amount of time and effort needed to get new information from one's contacts. New posts and site changes can be sent to others directly, reducing the need to connect with each contact separately in order to determine up-to-date information and content. While this study did not specifically analyze the various online information sharing capabilities, it does provide an indication that online information sharing needs to be taken into account when studying an entrepreneur's social network or the opportunity recognition process.

6.1 Limitations

The survey sample was distributed through only one educational segment, community colleges within the United States. Time constraints and desire for a larger response rate provided constraints on the use of a broader sample base. This limitation was addressed through the expanded inclusion of adult continuing education students. This student base provided access to a broader age, race, and work experience demographic than was possible by targeting only undergraduate students.

By limiting the survey to the United States, findings from this study may be limited due to cross-cultural differences. However, two key factors critical to this study were easily met by conducting this survey in the United States and more specifically, in the state of Maryland. Maryland has a large percentage of the general population who have access to the Internet and social network sites. According to the November, 2007 U.S. Census Bureau Current Population Survey, the national average for households with Internet access by state was 67% and the state of Maryland was above the national average with 71.6%.

The other critical factor to be met was that the general population had to have a high enough concentration of nascent entrepreneurs so that the total sample size could be limited to hundreds instead of thousands. The highly educated and affluent population of Maryland ranked fifth in percentage of population with at least a bachelor's degree (35.2%) and among the top three states in median household income according to the U.S. Census Bureau's 2005 Annual Social and Economic Supplement to the Current Population Survey. With widespread Internet access, and high rankings in education and median income, the state of Maryland provided a good location for this study. These facts combined with the researcher's access to student groups within the state provided a good survey population from which to target nascent entrepreneurs that use online social networking sites.

The Internet-based survey method brought some limitations as well. While different Internet connection speeds and browser differences/settings (Couper 2000) can impact survey completion, the broad-based student use of college computer systems and networks mitigated

many of these limitations. However, many of the continuing education classes took place away from the college campus. In addition, some of these continuing education classes included those with varying degrees of "comfort" with Internet-based survey methods, which could have limited their effectiveness at and willingness to complete these online surveys. Since one of the student groups targeted were those that do not use online social network sites, it stands to reason that student segment may also be less inclined to complete an Internet-based survey, thereby adding a self-select bias to the results.

Opportunity recognition research has included some methodological concerns surrounding the accurate counting of opportunities that an individual recognizes (Gaglio & Katz, 2001). Requiring subjects to recall the number of opportunities recognized in past timeframes is a method used in several previous studies (Hills & Shrader, 1998; Singh et al., 1999) and was used in this study. To alleviate potential recall and retrospective bias (Goodwin, 1998) due to time lag and participant bias, respondents were asked to identify only the number of ideas they identified in the last month and year. In addition, the entrepreneurial ideas question was inserted in the middle of the survey in order to de-emphasize any importance attached to it.

6.2 Future Research

Although there are several research directions that can be further explored based on the results of this study, there are five primary and immediate directions that should be initially explored and one that should be explored in the near future. The first future research direction is to extend the research to study online and offline entrepreneurs. It is apparent, based on this study, that there is now a large enough sample of online social network users among entrepreneurs to make this sort of study feasible. The second research direction would be to focus more on the factors impacting entrepreneurial idea identification. Perhaps more extensive multi-item measures would help to better ascertain how factors such as online social network use, the number of contacts, and information exchange combine to influence the idea identification process.

Closely related to this is the third research direction, which should be to expand this research on idea identification to include the opportunity recognition process. While this study focused on idea identification and not the opportunity recognition process, results suggest a need to conduct further research concerning the impact of online social networks on the opportunity recognition process. Further studies exploring how quick and easy access to large numbers of contacts, the ability to easily exchange large amounts of information, and the further incorporation of these online social networks into everyday business should be undertaken.

The fourth research direction is to determine how the combination of online and offline factors influence idea identification. Findings from this study not only show distinct differences between online and offline nascent entrepreneurs, but also in the online and offline social networks of online nascent entrepreneurs. This study only scratched the surface by focusing primarily on contacts, information exchange, entrepreneurial ideas, and demographic factors. Additional factors such as time, socio-economic status, geographic location, and which online social network features are used could all provide essential information and understanding into the interplay between the entrepreneur's use of their online and offline social networks.

For example, this study did not provide conclusive evidence for supporting the positive link between the number of online contacts and idea recognition (Hypothesis 5). It may be that the combination of both online and offline network factors is what leads to increased idea identification. As stated earlier, the newness of these online tools may contribute to the lack of a fully developed sense of how online social networks help the entrepreneur. More time using these tools may make it easier for respondents to distinguish the direct impact of their online social network versus their offline social network on the areas being studied.

The study found that nascent entrepreneurs using online social network sites did report more entrepreneurial ideas than those nascent entrepreneurs that did not (Hypothesis 3c). However, this study did not provide conclusive evident for supporting the positive link between the number of online contacts and idea recognition (Hypothesis 5), which was only weakly supported. It may be that the combination of both online and offline network factors is what leads

to increased idea identification. Since results from this study demonstrate that more entrepreneurial ideas are identified by those using online social networks, further research is needed to determine what combination of online factors truly influence this increase in idea identification.

The fifth research direction that should be initially researched is to better measure the hypotheses that produced inconclusive results. Since results from this study indicate that more entrepreneurial ideas are identified by nascent entrepreneurs that use online social networks, further research is needed to determine the combination of online factors that influence this increase in idea identification. Development of multi-item measures, inclusion of additional factors, and an increased maturity in how to best leverage online social network tools could provide significant results from further study.

The sixth and final research direction may be the most important. Although it should not be immediately pursued, it may be considered within the next few years. It is apparent that the next generation of entrepreneurs will use computer technology as a major communication tool and mechanism for both establishing and maintaining their social contacts. The power to communicate on a *one-to-many* basis through online social networks is bound to have some negative impact on communication with one's social network and even perhaps on the entrepreneurial process. Although not specifically analyzed for this study, a review of the responses for online nascent entrepreneurs revealed that a few of them had more than 1,000 online contacts yet the corresponding number of entrepreneurial ideas recognized was not significantly different than those with less than half that number of online contacts.

Is there such a thing as too much information exchange or too many contacts for an entrepreneur? Perhaps the online social network of an entrepreneur with thousands of contacts can act like an informational black hole. A black hole is formed when a star dies and all its mass is squeezed into a single point. In much the same way, all of an entrepreneur's contacts and contextual information about those contacts can be consolidated into a single point, their online social network. Kleinberg (2008) found that through preferential attachment, new users to an

online social network will connect more often with well-connected members. This means that larger online networks will continue to grow through this attachment from new members or from the acquaintances of current network members.

Much like a black hole continues to pull in everything surrounding it through its immense gravitational pull, very large and well connected individual online social networks continue to attract and pull in more contacts and information ... an informational black hole. When the number of contacts and associated information becomes too large for an entrepreneur to manage, do entrepreneurial ideas become like light in a black hole, and can they no longer escape? This sort of future research represents a rarely explored area of study within entrepreneurship and may provide further insights into our understanding of some entrepreneurial processes.

Chapter 7: Further Statistical Analysis

This section provides some addition statistical analysis that is not directly related to the identified hypotheses and is intended to provide insight for possible further analysis based on this study. The section begins by providing insight regarding the comparison of online nascent entrepreneurs with online entrepreneurs. Next, the educational level of online nascent entrepreneurs is analyzed. Then, online networks of online nascent entrepreneurs are assessed to determine their use in establishing new contacts. Finally, the researcher conducts a gender analysis of online nascent entrepreneurs.

Online Entrepreneurs and Online Nascent Entrepreneurs

A total of 65 entrepreneurs were included in the study and 53 of them, representing 18% of the total sample, used online social network sites. Unfortunately, only 12 entrepreneurs could be considered "offline" entrepreneurs, so no comparison between the two entrepreneur groups could be conducted. However, a comparison of online nascent entrepreneur and online entrepreneurs could be conducted. The researcher wanted to determine if online entrepreneur responses were consistent of online nascent entrepreneur responses in three areas; (1) communication with online versus offline contacts, (2) number of online versus offline business contacts, and (3) number of entrepreneurial ideas versus online nascent entrepreneurs.

When comparing the number of online versus offline contacts for online entrepreneurs in Table 44, the results show that the mean of online contacts is larger, 210.3 to 159.8 respectively, at the $p<.01$ level. The standard deviation for both is very large, especially for offline contacts.

Table 44: Total Online and Offline Contacts *t*-Test for Online Entrepreneurs

	N	Mean**	Std. Deviation
Online Contacts	53	210.34	256.02
Offline Contacts	53	159.77	378.21

**Significant difference at $p<.01$

When comparing the total contacts for online entrepreneurs and online nascent entrepreneurs, the means are much closer than they were when comparing online and offline

nascent entrepreneurs, which were 301 and 32 respectively. The *t*-test results in Table 45 show that the mean number of total contacts for online entrepreneurs was larger (370) than for online nascent entrepreneurs (328.6), but no statistical difference was found. There is more variance in the potential number of contacts for online entrepreneurs sampled than for the online nascent entrepreneurs sampled and the two groups, in regards to their total contacts, compare favorably with one another.

Table 45: Total Contacts *t*-Test for Online Entrepreneurs and Online Nascent Entrepreneurs

	N	Mean	Std. Deviation
Online Nascent Contacts	64	328.61	285.06
Online Entrepreneur Contacts	53	370.11	378.21

The *t*-test results for online versus offline business contacts for online entrepreneurs are shown in Table 46. The mean number of online business contacts was larger than the number of offline business contacts, 36.57 and 19.43 respectively, at the $p<.001$ level. Results indicate that entrepreneurs do tend to identify more business contacts from their online network than from their offline network.

Table 46: Online Entrepreneur–Online vs. Offline Business Contact *t*-Test

	N	Mean***	Std. Deviation
Online Business Contacts	53	36.57	55.08
Offline Business Contacts	53	19.43	35.35

***Significant difference at p<.001

The total business contacts for online entrepreneurs were then compared against those for online nascent entrepreneurs. The *t*-test results are shown in Table 47 and show significant difference at the $p<.001$ level with 56 and 34.63 business contacts respectively.

Table 47: Business Contact *t*-Test for Online Entrepreneur vs. Online Nascent Entrepreneurs

	N	Mean***	Std. Deviation
Online Nascent Business Contacts	64	34.63	18.07
Online Entrepreneur Business Contacts	53	56.00	26.19

***Significant difference at $p<.001$

When comparing results for entrepreneurial ideas, as shown in Table 48, the online nascent entrepreneur mean is larger than the online entrepreneur mean, 6.19 versus 3.79 respectively.

Table 48: Entrepreneurial Idea Comparison–Online Nascent Entrepreneurs vs. Online Entrepreneurs *t*-Test

	N	**Mean	Std. Deviation
Online Nascent Ideas	64	6.19	5.53
Online Entrepreneur Ideas	53	3.79	4.18

**Significant difference at $p<.01$

The *t*-test results show that the difference in idea identification between online nascent entrepreneurs and online entrepreneurs was significant at the $p<.01$ level.

Based on these initial results, it would appear that further research concerning the online communication and entrepreneurial activities of entrepreneurs is warranted. Results suggest that online communication habits of online entrepreneurs and online nascent entrepreneurs have some similarities. While their total number of contacts are similar, they differ in the mean number of business contacts and entrepreneurial ideas recognized.

Educational Level of Online Nascent Entrepreneurs

Based on previously identified descriptive statistics in this study, educational level of nascent entrepreneurs may provide another area for further research. Additional analysis was conducted to determine the impact that education level had on the number of entrepreneurial ideas and business contacts reported. To insure that there were enough respondents for analysis, educational level of online nascent entrepreneurs was divided into two groups, those

with a college degree (Associates, Bachelors, Some Graduate Degree, Graduate Degree) and those without (High School Diploma, GED, Some College – No Degree, Technical or Trade School).

The *t*-test results in Table 49 show that there were 47 online nascent entrepreneurs with no college degree and 39 with a college degree. The mean number of business contacts for each was very similar. Results show there is little difference between the two groups regarding their number of business contacts.

Table 49: Online Nascent Business Contacts Based on Level of Education *t*-Test

	N	Mean	Std. Deviation
No College Degree – Business Contacts	47	19.70	48.74
College Degree – Business Contacts	39	19.97	28.46

The *t*-test results for entrepreneurial ideas by educational level, as shown in Table 50, show little significant difference, with the means for those with and without college degrees differing by less than one.

Table 50: Online Nascent Entrepreneurial Ideas Based on Level of Education *t*-Test

	N	Mean	Std. Deviation
No College Degree – Ideas	47	5.55	6.15
College Degree – Ideas	39	4.77	3.63

Based on these initial results, it appears that the educational level of a nascent entrepreneur has little impact on identifying their online business contacts or entrepreneurial ideas.

Using Online Networks to Establish New Contacts

Constructing an initial resource base in a new venture requires that resources be identified, assembled, and acquired to meet a perceived opportunity, before they are allocated to fit a product and market strategy (Brush et al., 2001). Online social networks support ongoing communication with one's current contacts and facilitate the creation of new contacts through

referrals (friends of friends). Findings from this study support the notion that nascent entrepreneurs can develop a rather extensive network of contacts and through use of automated tools and posting of materials on one's personal web page, nascent entrepreneurs can maintain ongoing communication with these contacts as frequently as desired.

The discrepancy between the number of online contacts and offline contacts helps to provide insight into both new contacts that can be established through online network use and the number of contacts can maintained using them. Respondents were asked to identify the number of online contacts, offline contacts, and the number of contacts that were members of both their online and offline network when they estimated their total number of contacts. The number of contacts that were members of both the online and offline network was deleted from the number of online contacts. The remaining contacts had to be new contacts established online since they were not part of the offline network. The same process was done for business contacts for online nascent entrepreneurs, with the results listed in Table 51.

Table 51: New Online Nascent Entrepreneur Contacts

	N	Mean	Std. Deviation
New Online Contacts	64	160.48	202.05
New Online Business Contacts	64	7.34	26.20

Results show that online nascent entrepreneurs identified a large number of new total contacts and a significant number of new business contacts online. Interviews with the survey pretest group provided some insight into the discrepancy of contacts between the online and offline contacts. When asked why there were more online contacts than offline contacts, the consistent answer given was that the larger number of online contacts was due to two reasons: the ease with which one could establish new contacts through *friends of friends* and the ability to more easily maintain contacts and relationships online rather than offline. What this study shows is that it is not necessarily the comparison of one's online versus offline network that is more important, it is the presence or absence of an online network that impacts the size of a network and number of business contacts.

Gender Analysis

The impact of gender and online social network use is another possible area of study. The impact of gender on identifying online/offline business contacts, online/offline strong ties, and online/offline entrepreneurial ideas would be interesting areas for further study for example. Breakdown of gender is shown in Table 52.

Table 52: Entrepreneur and Nascent Entrepreneur Gender Breakdown

	Online Nascent Male	Online Nascent Female	Offline Nascent Male	Offline Nascent Female	Online Entrepreneur Male	Online Entrepreneur Female
Mean	30.00	56.00	28.00	28.00	12.00	41.00

When the number of males and females for the online nascent entrepreneurs, offline nascent entrepreneurs, and online entrepreneurs was evaluated, it was determined that only two groups, online nascent entrepreneur males and online female entrepreneurs, had large enough sample sizes to analyze. Therefore, gender impact analysis is not conducted as part of this study, but does present an interesting area for future research.

Chapter 8: Conclusions

What this study demonstrates is the importance of an online social network as a supplement to one's offline network. Results comparing a nascent entrepreneur's online and offline network around information exchange (Hypothesis 2b), entrepreneurial idea generation (Hypothesis 3d), level of business knowledge (Hypothesis 3e), and strong tie information exchange (Hypothesis 4c) were all inconclusive. Although none of these hypotheses were rejected, their inconclusive results point to a need for more research so that we can better understand the difference of usage between online and offline networks.

What was clear in the study findings was that nascent entrepreneurs using online social networking sites tend to have some advantages over nascent entrepreneurs that do not use online social network sites. These advantages include: (1) a larger number of general contacts, business contacts, weak ties, strong ties, and entrepreneurial ideas (Hypotheses 1a, 3b, 4a, 4b, and 3c respectively), and (2) a tendency to exchange of more information (Hypothesis 2a) with these various contacts. Although a positive correlation between the number of online contacts and the number of entrepreneurial ideas generated was only weakly supported, linkage between the two does seem to exist.

The importance of social networks to entrepreneurial research has been well established in this dissertation and the fact that an individual can communicate more information, more frequently, and with less effort to their network certainly presents a number of possibilities for future entrepreneurial research. The size, frequency of use, and number of contacts communicated with weekly varied greatly within the study sample. Despite this variance in usage, those that had an online network consistency reported increases in the number of contacts, number of contacts communicated with, and information exchanged over those that did not use one. It is much like comparing the transportation differences between bicycles with that of the automobile. Both can get your there and both have their advantages and disadvantages. However in the time it takes to make a trip on a bicycle, you can make multiple trips in the automobile. Perhaps those trips are not as good or satisfying, but the ability to make more of

them and see more friends/family in the same amount of time makes the automobile, in many ways, the preferred option.

This study did not attempt to distinguish how respondents used their online networks only that they used them. It is clear to the researcher that determining how a nascent entrepreneur uses their network may be a more important factor on idea identification than the simply use of the online network. At this time, online social networks continue to expand rapidly, but as identified in this study, a large number of the new users are above the age of 25 and may still be trying to determine how best to integrate online social network use into their daily lives. Results of this study show that use of online networks does positively impact the number of contacts, business contacts, number of weak ties, number of strong ties, and the amount of information exchange. The next step is to determine the impact of online social network use on various aspects of the entrepreneurial process. More importantly, future research must try and determine if specific aspects or uses of these online networks are more influential than others in the entrepreneurial process.

The automobile has not replaced the bicycle, but for many, it is the preferred mode of transportation and for many in this dissertation study the same holds true when considering online and offline social network use. Not all that use an online social network prefer it to traditional face-to-face communication, but for at least some communication needs, the online network can represent a better communication option. It is reasonable to assume that online social network use will continue to evolve and with the expansion of these networks, entrepreneurs will find new ways to exploit their capabilities. While this study demonstrates that online social networks influence a number of social network factors and idea identification, it represents only the first step in understanding the overall potential impact of these online capabilities. Moving forward, the impact of online social networks on other aspects of the entrepreneurial process is ripe for study.

REFERENCES

Adler, P. & Kwon, S. (2000). Social capital: The good, the bad and the ugly. In E. Lesser (Ed.), *Knowledge and social capital: Foundations and applications* (80–115). Boston: Butterworth-Heineman.

Adler, P. & Kwon, S. (2002). Social capital: Prospects for a new concept. *Academy of Management Review, 27* (1), 17–40.

Aldrich, H. (1999). *Organizations Evolving*. Sage Publications, Newbury Park, CA.

Aldrich, H. & Zimmer, C. (1986). Entrepreneurship through social networks. In D. Sexton & R. Smiler (eds.). *The Art and Science of Entrepreneurship*, 3–23. New York: Ballinger.

Aldrich, H., Renzulli, L., & Langton, N. (1998). Passing on privilege: resources provided by self-employed parents to their self-employed children. *Research in Social Stratification and Mobility 16*, 291–17.

Aldrich, H. & Martinez, M. (2001). Many are called, but few are chosen: an evolutionary perspective for the study of entrepreneurship. *Entrepreneurial Theory Practice*, *25*(4), 41–56.

Albanese, A.R. (2006). Google is not the net: Social networks are surging and present the real service challenge and opportunity for libraries. *Library Journal, 131* (15), 32–34.

Ardichvili, A. & Cardozo, R. (2000). A model of the entrepreneurial opportunity recognition process. *Journal of Enterprising Culture, 8* (2), 103–119.

Arenius, P. & de Clercq, D. (2005). A network-based approach on opportunity recognition. *Small Business Economics, 24*, 249–265.

Armstrong, J.S. & Overton, T.S. (1977). Estimating non-response bias in mail surveys. *Journal of Marketing Research, 14* (3), 396–402.

Arnett, J.J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*, 469–480.

Bamford, C., Dean, T., & McDougall, P. (2000). An examination of the impact of initial founding conditions and decisions upon the performance of new bank start-ups. *Journal of Business Venturing, 15* (3), 253–277

Barnes J.A. (1954) Class and committees in a Norwegian island parish. *Human Relations, 7*, 39–58.

Baron, R.A. (1998). Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing, 13* (4), 275–294.

Baron, R.A. (2004). Opportunity recognition: a cognitive perspective. *Academy of Management Proceedings*, A1–A6.

Baron, R.A. (2006). Opportunity recognition as pattern recognition: How entrepreneurs "connect the dots" to identify new business opportunities. *The Academy of Management Perspectives*, Briarcliff Manor: *20* (1), 104.

Baron, R.A. & Ensley, M.D. (2006). Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management Science*, 52(9), 1331–1344.

Baron, N., & Hannan, M. (1994). The impact of economics on contemporary sociology. *Journal of Economic Literature*, 32, 1111–1146.

Batjargal, B. & Liu, M. (2004). Entrepreneurs' access to private equity in China: The role of social capital. *Organization Science, 15* (2), 159–172.

Bhave, M.P. (1994). A process model of entrepreneurial venture creation. *Journal of Business Venturing, 9*, 223–242.

Birley, S. (1985). The role of networks in the entrepreneurial process. *Journal of Business Venturing, 1*, 107–117.

Borch, O.J. (1994). The process of relational contracting: Developing trust-based strategic alliances among small business enterprises. In P. Shrivastava, A. Huff & J. Dutton (eds.), *Advances in Strategic Management, 10B*, 113–135.

Bourdieu, P. (1983). Forms of capital. In: Richardson, J. (Ed.), *Handbook of Theory and Research for the Sociology of Education*, Greenwood Press, New York, 241–258.

Boyd, D.M., & Ellison, N.B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13* (1), 210–230.

Boyd, D.M. (2006). Friends, Friendsters, and MySpace Top 8: Writing community into being on social network sites. *First Monday, 11* (12).

Brown, B. & Butler, J.E. (1995). Competitors as allies: A study of entrepreneurial networks in the U.S. wine industry. *Journal of Small Business Management, 33* (3), 57–66.

Bruderl, J., Preisendorfer, P., & Ziegler, R. (1992). Survival chances of newly founded business organizations. *American Sociological Review, 57*, 227–242.

Bruderl, J. & Preisendorfer, P. (1998). Network support and the success of newly founded businesses. *Small Business Economics, 10*, 213–225.

Brush, C.G., Greene, P.G., & Hart, M.M. (2001). From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base. *Academy of Management Executive, 15* (1), 64–78.

Burnett, G. (2000). Information exchange in virtual communities: A typology. *Information Research, 5*(4), paper 82.

Burnett, G. (2002). The scattered members of an invisible republic: Virtual communities and Paul Ricoeur's hermeneutics. *The Library Quarterly, 72* (2), 155–78.

Burt, R.S. (1984): Network items and the General Social Survey. *Social Networks, 6*, 293–339.

Burt, R.S. (1997). The contingent value of social capital. *Administrative Science Quarterly, 42*, 339–365.

Burt, R.S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.

Busenitz, L. & Barney, J. (1997). Differences between entrepreneurs and managers in organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing, 12* (1), 9–30.

Carter, N., Gartner, W., & Reynolds, P. (1996). Exploring start-up event sequences. *Journal of Business Venturing, 11*, 151– 166.

Carter, D. (2005). Living in virtual communities: An ethnography of human relationships cyberspace. *Information, Communication and Society*, 8 (2), 148–67.

Carter, N.M., Gartner, W.B., Shaver, K.G., & Gatewood, E.J. (2003). The career reasons of nascent entrepreneurs. *Journal of Business Venturing, 18*, 13–39.

Case, J. (1989). *The origins of entrepreneurship. Inc.*, June, 54.

Casson, M. (2005). The individual-opportunity nexus: a review of Scott Shane. A general theory of entrepreneurship. *Small Business Economics, 24*, 423–430.

Centola, D. & Macy, M., (2007). Complex contagions and the weakness of long ties. *American Journal of Sociology, 113*, 702–734.

Chan, H., Teo, H., Wei, K. & Zhang, Z. (2003). Evaluating information accessibility community adaptivity features for sustaining learning communities. *Journal of Human-Computer Studies*, 59 (5), 671–697.

Chandler, G. & Lyons, D. (2001). Issues of research design and construct measurement in entrepreneurship research: The past decade. *Entrepreneurship, Theory & Practice*, 25 (4), 101–113.

Christensen, P.S., Madsen, O., & Peterson, R. (1994). Conceptualizing entrepreneurial opportunity recognition. In G. E. Hills (ed.) *Marketing and Entrepreneurship: Research Ideas and Opportunities* (pp. 61–75). Westport, CT: Quorum Books.

ClickZ, (2010). *Facebook doubles, MySpace visitors down in November*. Retrieved from http://www.clickz.com/3635991.

Colarelli O'Connor G. & Rice M. (2001). Opportunity recognition process and breakthrough innovation in a large established firm. *California Management Review 43* (2), 95–116.

Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology Supplement, 94*, 95–120.

Coleman, J. (1990). *Foundations of social theory*. Cambridge, MA: Belknap Press.

Comscore (2009). *The 2009 U.S. digital year in review*. Retrieved February 7, 2010 from http://www.comscore.com/Press_Events/Press_Releases/2010/2/comScore_Releases_2009_U.S._Digital_Year_in_Review.

Cook, K. & Whitmeyer, M. (1992). Two approaches to social structure: exchange theory and network analysis. *Annual Review of Sociology, 18*, 109–127.

Cooper, A.C., Dunkelberg, W., Woo, C., & Dennis, W. (1990). *New business in America: The firms and their owners*. Washington, DC: The National Federation of Independent Business.

Cooper, A., Gimeno-Gascon, J., & Woo, C. (1994). Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing, 9*, 371- 395.

Corbett, A.C. (2002). *Opportunity recognition: A learning and cognitive approach*. Unpublished doctoral dissertation, University of Colorado.

Couper, M. (2000). Web surveys: A review of issues and practices. *Public Opinion Quarterly Volume, 64*, 464–494.

Courtright, C. & Kling, R. (2003). Group behavior and learning in electronic forums: a sociotechnical approach. *Information Society, 19* (3), 221–35.

Coyle, C.L. & Vaughn, H. (2008). Social networking: communication revolution or evolution? *Bell Labs Technical Journal, 13* (2), 13–18.

Cross, R. & Cummings, J. (2004). Tie and network correlates of individual performance in knowledge intensive work. *Academy of Management Journal, 47* (6), 928–937.

Cyert, R.M. & March, J.G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, N.J: Prentice Hall.

Davidsson, P. (2003). The domain of entrepreneurship research: Some suggestions. JIBS Working Paper Series 2003 WP2003–3: Jonkoping International Business School.

Davidsson, P. & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing, 18*, 301–331.

Davidsson, P., Lindmark, L., & Olofsson, C. (1994). New firm formation and regional development in Sweden. *Regional Studies, 28* (4), 395–410.

Davis, D.C. (2007). *My space isn't your space*. Berkeley Commercial Press, Legal Series, 1943.

De Carolis, D.M. & Saparito, P. (2006). Social capital, cognition, and entrepreneurial opportunities: A theoretical framework. *Entrepreneurship Theory, and Practice, 30* (1), 41–56.

De Koning, A. & Muzyka, D. (1996). The convergence of good ideas: When and how do entrepreneurial managers recognize innovative business ideas? In: *Frontiers of Entrepreneurship Research*. Eds Churchill, N., Bygrave, W., Butler, J., Birley, S., Davidsson, P., Gartner, W. and McDougall, P. Wellesley, MA: Babson College.

Delacroix, J. & Carroll, G. (1983). Organizational foundings: an ecological study of the newspaper industries of Argentina and Ireland. *Administrative Science Quarterly, 28*, 274– 291.

Delmar, F. & Shane, S. (2004). Legitimating first: organizing activities and the survival of new ventures. *Journal of Business Venturing, 19*, 385– 410.

Delmar, F. & Shane, S. (2004). Planning for the market: business planning before marketing and the continuation of organizing efforts. *Journal of Business Venturing, 19*, 767– 785.

Eberhardt, D.M. (2007). Facing up to Facebook. *About Campus*, Sept–Oct, 18–26.

Elfring, T. & Hulsink, W. (2003). Networks in entrepreneurship: The case of high-technology firms. *Small Business Economics, 21*, 409–422.

Ellison, N.B., Steinfield, C. & Lampe, C. (2007). The Benefits of Facebook "friends": Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication, 12* (4), 1143–1168.

Emerson, R. (1972). Exchange theory, Part I: A psychological basis for social exchange. In: Berger, J., Zelditch, M., Anderson, B. (Eds.), *Sociological Theories in Progress*, Houghton Mifflin, Boston, 38–57.

Erdos, P. & Renyi, A. (1959). On random graphs. *Publicationes Mathematicae Debrencen 6*, 290–97.

Fletcher, D.F. (2006). Entrepreneurial processes and the social construction of opportunity, *Entrepreneurship and Regional Development*, London: *18* (5), 421.

Friedkin, N.E. (1986). A formal theory of social power. *Journal of Mathematical Sociology, 12*, 103–126.

Fono, D. & Raynes-Goldie, K. (2006). Hyperfriendship and beyond: Friends and social norms on LiveJournal. In M. Consalvo & C. Haythornthwaite (Eds.), *Internet Research Annual Volume 4: Selected Papers from the AOIR Conference* (pp. 91–103). New York: Peter Lang.

Gaglio, C.M. & Katz, J. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. *Small Business Economics, 16* (2), 95–111.

Gaglio, C.M., & Taub, R.P. (1992). Entrepreneurs and opportunity recognition. *Frontiers of Entrepreneurship Research, 12*, 136–147.

Gillespie, J. (1999). Corporate social capital and the cost of financial capital: An embeddedness approach. R. Leenders, S. Gabbay, eds., *Corporate Social Capital and Liability*, Kluwer Academic Publishers, Boston, MA.

Goodwin, C.J. (1998). *Research in psychology: Methods and design*. New York: John Wiley and Sons.

Graham, D. & Hazai, H. (2004). Creation and recreation: motivating collaboration to generate knowledge capital in online communities. *International Journal of Information Management, 24* (3), 235–46.

Granovetter, M.S. (1973). The strength of weak ties. *American Journal of Sociology, 78* (6), 1360–1380.

Granovetter, M.S. (1983). The strength of the weak ties: Revisited. *Sociological Theory, 1*, 257–277.

Granovetter, M.S. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology, 91* (3), 481–510.

Granovetter, M.S. (1992). Problems of explanation in economic sociology. In N. Nohria &R. Eccles (Eds.), *Networks and organizations: Structure, form, and action* 25–56. Boston: Harvard Business School Press.

Granovetter, M.S. (2004). The impact of social structures on economic development. *Journal of Economic Perspectives, 19* (1), 33–50.

Greene, P. & Brown, T. (1997). Resource needs and the dynamic capitalism typology. *Journal of Business Venturing, 12* (3), 161–173.

Greve, A. & Salaff, J.W. (2003) Social networks and entrepreneurship. *Entrepreneurship Theory and Practice, 28* (1), 1–22.

Grossman, E.B. (2005). *New venture creation and network tie formation: A longitudinal study of nascent entrepreneurs' efforts in business-building*. University of California, Los Angeles.

Gruhl, D., Guha, R., Liben-Nowell, D., & Tomkins, A. (2004). Information diffusion through blogspace. WWW '04: Proceedings of the 13th international conference on World Wide Web, May, ACM.

Gulati, R. (1995). Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal, 38* (1), 85–112.

Gulati, R. & Gargiulo, M. (2000). Where do interorganziational networks come from? *American Journal of Sociology, 104*. 1439–1493.

Gusfield, J.R. (1975). The community: A critical response. Harper Colophon, New York, NY.

Hansen, E.L. (1995). Entrepreneurial network and new organization growth. *Entrepreneurship Theory & Practice, 19* (4), 7–19.

Hart, K. (2008). A flashy Facebook page, at a cost to privacy: Add-ons to online social profiles expose personal data to strangers. *The Washington Post*, June 12, p. A1 & A10.

Hatala, J.P. (2006). Social network analysis in human resource development: A new methodology. *Human Resource Development Review, 5* (1): 45.

Hayek, F.A. (1937). Economics and knowledge, *Economica 4* (New series), 33–54.

Hayek, F.A. (1945). The use of knowledge in society. *American Economic Review, 35* (4), 519–530.

Haythornthwaite, C. (2001). The internet in everyday life. *American Behavioral Scientist, 45* (3), 363–82.

Haythornthwaite, C. (2005). Social networks and internet connectivity effects. *Information, Communication, & Society, 8* (2), 125–147.

Hersberger, J.A., Murray, A.L., & Rioux, K.S. (2007). Examining information exchange and virtual communities: an emergent framework. *Online Information Review*. Bradford. *31* (2), 135.

Hersberger, J., Rioux, K. & Cruitt, R.O. (2005). Examining information sharing and relationship building in online social networks: an emergent analytic framework, paper presented at the Annual Conference of the Canadian Association for Information Science held with the Congress of the Social Sciences and Humanities of Canada, June 2–4, London, available at: www.cais-acsi.ca/proceedings/2005/hersberger_2005.pdf

Hills, G. (1995). Opportunity recognition by successful entrepreneurs: A pilot study. In: *Frontiers of Entrepreneurship Research*. Eds Hay, M., Bygrave, W., Birley, S., Churchill, N., Keeley, R., Bird, B., and Wetzel, W. Jr. Wellesley, MA: Babson College.

Hills, G. & Shrader, R. (1998). Successful entrepreneurs' insights into opportunity recognition. In: *Frontiers of Entrepreneurship Research*. Eds Reynolds, P., Bygrave, W., Carter, N. and Manigart, S. Wellesley, MA: Babson College.

Howard, B. (2008). Analyzing online social networks. *Communications of the Association for Computing Machinery (ACM), 51* (11), 14–16.

Jo, H. & Lee, J. (1996). The relationship between an entrepreneur's background and performance in a new venture. *Technovation, 16* (4), 161–171.

Johannisson, B. (1990). Economics of overview – Guiding the external growth of small firms. *International Small Business Journal, 9*, 32–44.

Joshi, A., Labianca, G., & Caligiuri, P.M. (2002). Getting along long distance: Understanding conflict in a multinational team through network analysis. *Journal of World Business, 37*, 277–284.

Julien, P.A. & Vaghely, I. (2001). From weak signals to decision making: Information acquisition and use as the entrepreneur's source of opportunities. In *Frontiers of Entrepreneurship Research*. Eds Bygrave, W., Autio, E., Brush, C., Davidsson, P., Green, P., Reynolds, P., and Sapienza, H. Wellesley, MA: Babson College.

Kaish, S. & Gilad, B. (1991). Characteristics of opportunities search of entrepreneurs versus executives: Sources, interests, general alertness. *Journal of Business Venturing, 6*, 45–61.

Katz, J. & Gartner, W. (1988). Properties of emerging organizations. *Academy of Management Review, 18* (3), 429– 442.

Kempe, D., Kleinberg, J., & Tardos, E. (2003). Maximizing the spread of influence in a social network. In *Proceedings of the 9th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 137–146.

Kirzner, I. (1973). *Competition and entrepreneurship*. Chicago: University of Chicago Press.

Kleinberg, K. (2008). The Convergence of social and technological networks. *Communications of the ACM, 51* (11), 66 – 72.

Kleinberg, J. (2001). Small-world phenomena and the dynamics of information. In *Proceedings of the 14th Advances in Neural Information Processing Systems*, 431–438.

Ko, S. & Butler, J.E. (2007). Creativity: A key link to entrepreneurial behavior. *Business Horizons*, Greenwich: *50* (5); 365.

Koh, J., Kim, Y., Butler, B., & Bock, G. (2007). Encouraging participation in virtual communities. *Communications of the ACM, 50* (2), 69–73.

Kolb, D.A., Boyatzis, R.E., & Mainemelis, C. (2000). Experiential learning theory: previous research and new directions. In R.J. Sternberg & L.F. Zhang (Eds), *Perspectives on cognitive, learning and thinking styles* (227–247). Mahwah, NJ: Lawrence Erlbaum.

Koller, R. (1988). On the source of entrepreneurial ideas. In: B. Kirchhoff, W. Long, W. McMullan, K. Vesper and W. Wetzel, Editors, *Frontiers of entrepreneurship research*, Center for Entrepreneurial Studies, Babson College, Wellesley, MA, 194–207.

Kossinets, G. & Watts, D. (2006). Empirical analysis of an evolving social network. *Science, 311*, 88–90.

Kristiansen, S. (2004). Social networks and business success: The role of subcultures in an African context. *The American Journal of Economics and Sociology, 63* (5), 1149–1171.

Lai, L. & Turban, E. (2008). Group decision and negotiation. *Dordrecht: 17* (5), 387–403.

Lampe, C., Ellison, N., & Steinfield, C. (2006). A Face(book) in the crowd: Social searching vs. social browsing. *Proceedings of CSCW–2006* (pp. 167–170). New York: ACM Press.

Landström, H. & Winborg, J. (1995). Small business managers' attitudes and use of financial sources. *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College.

Lenhart, A. & Madden, M. (2007). Teens, privacy, & online social networks. *Pew Internet and American Life Project Report*. Retrieved July 30, 2007 from http://www.pewinternet.org/pdfs/PIP_Teens_Privacy_SNS_Report_Final.pdf

Larson, A. & Starr, J.A. (1993). A network model of organization formation. *Entrepreneurship Theory and Practice, 17* (2), 5–15.

Leana, C. & Van Buren, H. (1999). Organizational social capital and employment practices. *Academy of Management Review, 24*, 538–555.

Lee, J.H. & Venkataraman, S. (2006). Aspirations, market offerings, and the pursuit of entrepreneurial opportunities. *Journal of Business Venturing, 21*, 107–123.

Leskovec, J., Kleinberg, J., & Faloutsos, C. (2005). Graphs over time: Densification laws, shrinking diameters and possible explanations. In *Proceedings of the 11th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 177–187.

Liben-Nowell, D., Novak, J., Kumar, R., Raghavan, P., & Tomkins, A. (2005). Geographic routing in social networks. In *Proceedings of National Academy of Science, 102* (33), 11623–11628

Lin, N. (2001). *Social Capital: A theory of social structure and action*. New York: Cambridge University Press, 150–151

Lin, N., Ensel, W., & Vaughn, J. (1981). Social resources and strength of ties: structural factors in occupational status attainment. *American Sociological Review, 46* (4), 393–405.

Lin, N., Woelfel, M., & Light, S.C. (1986). *Buffering the impact of the most important life event*. New York: Academic Press.

Long, W. & McMullan, W.E. (1984). Mapping the new venture opportunity identification process. *Frontiers of Entrepreneurship Research, 4*, 567–590

Loury, G. (1987). Why should we care about group inequality? *Social Philosophy and Policy, 5*, 249–271.

Lumpkin, G.T., Hills, G., & Shrader, R. (2004). Opportunity recognition. In H.P. Welsch (Ed.) *Entrepreneurship: The way ahead* (73–90). New York: Routledge.

Lumpkin, G.T. & Lichtenstein, B.B. (2005). The role of organisational learning in the opportunity recognition process. *Entrepreneurship Theory and Practice*, 29, 451–472.

MacMillan, I., Siegel, R. & Subbanarasimha, P.N. (1985). Criteria used by venture capitalist to evaluate new venture proposals. *Journal of Business Venturing, 1* (1), 119–128.

Marsden, P. (1981). Introducing influence processes into a system of collective decisions. *American Journal of Sociology, 86*, 1203–1235.

Marsden, P.V. & Campbell, K.E. (1984). Measuring tie strength. *Social Forces, 63*, 482–501.

McAdam, D. & Paulsen, R. (1993). Specifying the relationship between social ties and activism. *American Journal of Sociology, 99*, 640–67.

Nahapiet, J. & Ghoshal, S. (1998). Social capital, intellectual capital, and the organization advantage. *Academy of Management Review, 23*, 242–266.

Newbert, S.L. (2005). New firm formation: a dynamic capability perspective. *Journal of Small Business Management, 43* (1), 55–77.

Ouchi, W.G. (1980). Markets, bureaucracies and clans. *Administrative Science Quarterly, 25* (1), 129–141.

Ozgen, E. (2003). *Entrepreneurial opportunity recognition: Information flow, social and cognitive perspectives*. Unpublished doctoral dissertation, Rensselaer Polytechnic Institute, Troy, NY.

Parameswaran, M. & Whinston, A. (2007). Research issues in social computing. *Journal of the Association for Information Systems, 8* (6), 336–350.

Paxton, P. (1999). Is social capital declining in the United States? A multiple indicator assessment. *American Journal of Sociology, 105* (1), 88–127.

Piatetsky, G. (2007). Interview with Jon Kleinberg. *SIGKDD Explorations Newsletter, 9* (2), 47–50.

Portes, A. (1998). Social capital. *Annual Review of Sociology, 23*, 1–24.

Powell, W.W., White, D.R, Koput, K.W. & Owen-Smith, J. (2005). Network dynamics and field evolution: The growth of interorganizational collaboration in the life sciences. *American Journal of Sociology, 110* (4), 1132–1205.

Puhakka, V. (2006). Effects of social capital on the opportunity recognition process. *Journal of Enterprising Culture, 14* (2), 105–124.

Putnam, R.D. (1993). The prosperous community: Social capital and economic growth. *American Prospect, 13*, 35–42.

Putnam, R. (2000). Bowling alone: the collapse and revival of American community. New York: Simon and Schuster.

Rapoport, A. (1953). Spread of information through a population with socio-structural bias 1: Assumption of transitivity. *Bulletin of Mathematical Biophysics, 15* (4), 523–533.

Reynolds, P.D. (2000). National panel study of U.S. business startups: Background and methodology. In: Katz, J.A. (Ed.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, 4, 153–227, Stanford, CT: JAI Press.

Reynolds, P.D. (1994). Autonomous firm dynamics and economic growth in the United States 1986–1990. *Regional Studies, 28* (4), 429–442.

Reynolds, P.D. (1994). Reducing barriers to understanding new firm gestation: Prevalence and success of nascent entrepreneurs. Paper presented at the Academy of Management Meetings, Dallas, TX (August).

Reynolds, P.D. (1991). Sociology and entrepreneurship: Concepts and contributions. *Entrepreneurship Theory and Practice, 16* (2): 47–70.

Reynolds, P.D., Hay, M., Bygrave, W.D., Camp, S.M., & Autio, E. (2000). *Global entrepreneurship monitor: 2000 executive report*. Kansas City, MO: Kauffman Center for Entrepreneurial Leadership.

Reynolds, P.D. & Maki, W.R. (1990). Business volatility and economic growth. Final project report. Small Business Administration, Contract SBA, Washington, DC, 3067–OA–99, May.

Reynolds, P.D & Miller, B. (1992). New firm gestation: conception, birth, and implications for research. *Journal of Business Venturing, 7*: 405–417.

Reynolds, P.D. & White, S.B. (1997). *The entrepreneurial process: Economic growth, men, women, and minorities*. Westport, CT: Quorum Books.

Rheingold H. (2003). Smart mobs: The next social revolution. New York: Basic Books.

Rioux, K. (2005). Rioux's Information Acquiring-and-Sharing Framework. In S. Erdelez, Karen Fisher & Lynne McKechnie (Eds.), *Theories of Information Behavior: A Researcher's Guide*. Medford, NJ: Information Today, Inc. Rogers, E. (1995). *Diffusion of Innovations, 4th Edition*. Free Press.

Salancik, G (1995). WANTED: A good network theory of organization. *Administrative Science Quarterly, 45* (1), 1–24.

Sapienza, H. & Grimm, C. (1997). Founder characteristics, start-up process, and strategy/structure variables as predictors of shortline railroad performance. *Entrepreneurship Theory and Practice, 21*. 5–24.

Schumpeter, J. A. (1934). *Theory of economic development* (trans. R. Opie). Cambridge, MA: Harvard University Press.

Schumpeter, J. (1934). *Capitalism, socialism and democracy*. New York: Harper & Row.

Shane, S. (2003). A general theory of entrepreneurship: The individual-opportunity nexus. Northampton, MA: Edward Elgar.

Shane, S. & Cable, D. (2002). Network ties, reputation, and the financing of new ventures. *Management Science, 48* (3), 364–381.

Shane, S. & Stuart, T. (2002). Organizational endowments and the performance of university start-ups. *Management Science, 48* (1), 154–170.

Shane, S. & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review, 25*. 217–226.

Shaver, K.G. & Scott, L.R. (1991). Person, process, choice: The psychology of new venture creation. *Entrepreneurship Theory and Practice, 16* (2), 23–45.

Singh, R. (2000). *Entrepreneurial opportunity recognition through social networks*. New York: Garland Publishing, Inc. Taylor and Francis Group.

Singh, R., Hybels, R., & Hills, G. (2000). Examining the role of social networks size and structural holes. *New England Journal of Entrepreneurship, 3* (2), 47–59.

Singh, R., Hills, G.E., Hybels, R.C. & Lumpkin, G.T. (1999). Opportunity recognition through social network characteristics of entrepreneurs. *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College: 228–241

Starr, J. & MacMillan, I.C. (1990). Resource cooptation via social contracting: Resource acquisition strategies for new ventures. *Strategic Management Journal, 11*, 79–92.

Steinfield, C., Ellison, N.B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology, 29*, 434–445.

Stimpert, J.L. (1992). Managerial thinking and large diversified firms. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Subrahmanyam, K., Reich, S.M., Waechter, N., & Espinoza, G. (2008). Online and offline social networks: Use of social networking sites by emerging adults. *Journal of Applied Developmental Psychology, 29*, 420–433.

Thomsen, S., Straubhaar, J., & Bolyard, D. (1998). Ethnomethodology and the study of online communities: Exploring the cyber streets. *Information Research*, 4(1). Retrieved from http://informationr.net/ir/4-1/paper50.html.

Tornikoski, E.T. & Newbert, S.L. (2007). Exploring the determinants of organizational emergence: A legitimacy perspective. *Journal of Business Venturing, 22*, 311–335.

Uzzi, B. (1996). The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *American Sociological Review, 61*, 674–698.

Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in Entrepreneurship Research, Firm Emergence and Growth, 3*, 119–138.

Vesper, K. (1996). *New venture experience*. Revised, Seattle, WA: Vector Books.

Ward, T.B. (2004). Cognition, creativity, and entrepreneurship. *Journal of Business Venturing, 19* (2), 173–188.

Watts, D. (2002). A simple model of global cascades on random networks. *Proceedings of the National Academy of Sciences 99*, 5766–5771.

Watts, D.J., Dodds, P.S., & Newman, M.E.J. (2002). Identity and search in social networks. *Science, 296* (5), 1302–1305.

Watts, D.J. & Strogatz, S.H. (1998). Collective dynamics of 'small-world' networks. *Nature, 393*, 440–42.

Weiss, A. (2005). The power of collective intelligence. *Collective Intelligence, 9* (3), 16–23.

Wellman, B. & Haythornthwaite, C. (2002). *The internet in everyday life*. Blackwell Publishing, Malden, MA.

Wellman, B., Salaff, J., Dimitrova, D., Garton, L., Gulia, M., & Haythornthwaite, C. (1996). Computer networks as social networks: Collaborative work, telework, and virtual community. *Annual Review of Sociology, 22*, 213–38.

Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society, 27* (2), 151–208.

Zimmerman, M.A. & Zeitz, G.J. (2002). Beyond survival: Achieving new venture growth by building legitimacy. *Academy of Management Review, 27* (3), 414– 431.

APPENDIX 1

SOCIAL NETWORK SURVEY

The explosive growth of online social networking sites provides millions with the ability to communicate more information to a larger group of people than existed in the past. The focus of this study is to determine whether online social networks are different from traditional 'offline' social networks. Your responses will be kept confidential and will NOT be released to anyone on an individual basis. Please click on the button that best represents your response to each question.

For the purpose of this survey, the definitions of online social network and offline social networks are:

An **online social network** - ***those friends/contacts that you communicate with via an online social network or through electronic means such as email and instant messaging.***

An **offline social network** – ***those friends/contacts that you communicate with via the phone or face-to-face conversations.***

*It is important to note that since we live in a dynamic communication environment, it is not unusual for some friends/contacts to be in both your online and offline social networks.

Do you use an online social network site?

- Yes
- No

Which ones do you use? (select all that apply)

- My Space
- Facebook
- LinkedIn
- Orkut
- Friendster
- Flickr
- College Tonight
- MEETin
- Twitter
- Classmates.com
- Bebo

Other_____

Please estimate the number of contacts/friends you have. Please enter a number in the box provided.

In your **ONLINE SOCIAL NETWORK ONLY** _____

In your **OFFLINE SOCIAL NETWORK ONLY** That you communicate with and are part of **BOTH** your **ONLINE AND OFFLINE NETWORKS** _____

How many of these contacts/friends you communicate with on a weekly basis? Please enter a number in the box provided.

In your **ONLINE SOCIAL NETWORK ONLY** _____

In your **OFFLINE SOCIAL NETWORK ONLY** That you communicate with and are part of **BOTH** your **ONLINE AND OFFLINE NETWORKS** _____

How many of these contacts/friends do you consider to be current or future business contacts? Please enter a number in the box provided.

In your **ONLINE SOCIAL NETWORK ONLY** _____

In your **OFFLINE SOCIAL NETWORK ONLY** That you communicate with and are part of **BOTH** your **ONLINE AND OFFLINE NETWORKS**

How many contacts/friends you consider to be "very close"?

In your **ONLINE SOCIAL NETWORK ONLY** _____

In your **OFFLINE SOCIAL NETWORK ONLY** That you communicate with and are part of **BOTH** your **ONLINE AND OFFLINE NETWORKS** _____

Please mark your level of agreement with the following statements.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
I exchange more information within my online social network than within my **offline social network**.					
I exchange more information with my "very close" online friends/contacts than with my "very close" offline friends/contacts.					
I communicate more frequently within my online **social network** than within my **offline social network**.					
Since I began using an **online social network** site, I have increased my general business knowledge.					
I exchange very little information within my online **social network**.					

How much information do you exchange on a weekly basis?

	A Very Large Amount	A Large Amount	Some	Little	Very Little	None
Information within your **online social network**?						
Information within your **offline social network**?						
General business information within your **online social network**?						

General business information within your **offline social network?**						
Financial information within your **online social network?**						
Financial information within your **offline social network?**						
Marketing information within your **online social network?**						
Marketing information within your **offline social network?**						

For the purpose of this survey, an entrepreneur is someone who generates revenue from an independent business. Which of the following best describes your entrepreneurial experiences? (Select all that apply)

- I am currently an entrepreneur.
- I am not currently an entrepreneur, but I have been one in the past.
- I am in the process of trying to start a business.
- I am not currently trying to start a business, but plan to in the near future.
- I am not currently trying to start a business, but may in the next few years.
- I am not planning to start a business.

Which of the following most accurately describes how you began your current/past firm?

- I first decided to start a business. I then conducted a search for opportunities which led to the idea for my business.
- I first recognized an idea for my business. I then initiated the process of starting my business to take advantage of it.

Entrepreneurial ideas are initial concepts for new business ventures. How many entrepreneurial ideas have you come-up with, if any?

In the past month _____

In the past year _____

Please mark your level of agreement with the following statements.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
My **online social network** is a more important source of business contacts that can help me with future business ventures than my offline network.	L	_	L	L	_
I identify more entrepreneurial ideas**I** using my **online social network** than my offline network.			I	I	
As the size of my **online social network** grows, I identify more entrepreneurial ideas.	I		I	I	

What is your highest level of formal education?

L High school diploma
I GED
I Technical or trade school
L Some college-no degree
I Two-year degree (AA, AS, AAS)
I Four-year degree (BA or BS)
L Graduate level course work, no degree
I Graduate degree

Undergraduate major

Technical or Trade speciality _____

Do you currently hold a trade or industry certification?

L Yes
I No

Gender

- ☐ Male
- ☐ Female

Age _____

Race/Ethnicity

- ☐ African American/Black
- ☐ American Indian
- ☐ Asian American
- ☐ Hispanic/Latino
- ☐ Caucasian/White
- ☐ Other

Thank you for your time

APPENDIX 2: Survey Email Notification

I am a doctoral student in management at Morgan State University and am conducting a survey of individuals to study the link between social networks and entrepreneurial idea generation. Your voluntary participation in this scientific study is absolutely critical for its success. The survey takes between 5 to 10 minutes to complete. The survey is completely anonymous.

If you wish to continue with the survey, please click on the following link (it may take a few seconds to load):

http://tinyurl.com/ycs7xll

If you have questions, you may contact me at 443-840-4495 or MLang12@verizon.net. Thank you in advance for your willingness to be a part of this study.

Matthew Lang

Bibliographic Data

Application No: 16/279,387

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /GURKANWALJIT SINGH/ Examiner's Signature | Initials

Title: TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
02/19/2019	705	3683	A12875-088356
RULE			

APPLICANTS

Afterwords, Inc., Tampa, FL;

INVENTORS

Steven A. Roberts Tampa, FL; UNITED STATES

Drew Peloubet Tampa, FL; UNITED STATES

CONTINUING DATA

This application is a CON of 14997434 01/15/2016

14997434 has PRO of 62104043 01/15/2015

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED

03/06/2019

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

ADDRESS

SHUMAKER LOOP & KENDRICK, LLP

101 E. KENNEDY

SUITE 2800

TAMPA, FL 33602

UNITED STATES

FILING FEE RECEIVED

$785

To: patdocketing@slk-law.com,ktirilli@slk-law.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 57838

Apr 05, 2019 04:01:55 AM

Dear PAIR Customer:

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 57838 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
16279387	NOA	04/05/2019	A12875-088356
	892	04/05/2019	A12875-088356
	1449	04/05/2019	A12875-088356

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice.

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

To: patdocketing@slk-law.com,ktirilli@slk-law.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 57838

Mar 08, 2019 04:08:39 AM

Dear PAIR Customer:

SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 57838 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
16279387	APP.FILE.REC.	03/08/2019	A12875-088356

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice.

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
[illegible]

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY DOCKET NO	TOT CLAIMS	IND CLAIMS
16/279,387	02/19/2019	3623	785	A12875-088356	19	2

CONFIRMATION NO. 6934

FILING RECEIPT



57838
SHUMAKER LOOP & KENDRICK, LLP
101 E. KENNEDY
SUITE 2800
TAMPA, FL 33602

Date Mailed: 03/08/2019

Receipt is acknowledged of this non provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Steven A. Roberts, Tampa, FL;
Drew Peloubet, Tampa, FL;

Applicant(s)

Afterwords, Inc., Tampa, FL;

Power of Attorney: The patent practitioners associated with Customer Number 57838

Domestic Priority data as claimed by applicant

This application is a CON of 14/997,434 01/15/2016
which claims benefit of 62/104,043 01/15/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 03/08/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/279,387**

Projected Publication Date: 06/13/2019

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **
Title

TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

Preliminary Class

705

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/279,387

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE($)	FEE($)		RATE($)	FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s)			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
If the difference in column 1 is less than zero, enter "0" in column 2			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 01/31/2016. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
16/279,387	2-19-2019

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

Number: 57838

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

AFTERWORDS, INC.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	Steve A. Roberts	Date (Optional)	20 Feb 2019
Name	Steve A. Roberts		
Title	President / Founder		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	35227960
Application Number:	16279387
International Application Number:	
Confirmation Number:	6934
Title of Invention:	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM
First Named Inventor/Applicant Name:	Steven A. Roberts
Customer Number:	57838
Filer:	Jeffrey Bruce Fabian/Charise Christianson
Filer Authorized By:	Jeffrey Bruce Fabian
Attorney Docket Number:	A12875-088856
Receipt Date:	22-FEB-2019
Filing Date:	
Time Stamp:	15:37:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	AFTERWORDS_Power_of_Attorney.pdf	3133442	no	1

Warnings:

Information:	
Total Files Size (in bytes):	3133442

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8328094	B2	2012-12-11	Proud, et al.	
	2	8417561	B2	2013-04-09	Ghosh, et al.	
	3	7937286	B2	2011-05-03	Newman,et al.	
	4	8027891	B2	2011-09-27	Preston, et al.	
	5	8255269	B2	2012-08-28	Rane et al.	
	6	7792697	B2	2010-09-07	Bhagchandani, et al.	
	7	7328169	B2	2008-02-05	Temares, et al.	
	8	6839682	B1	2005-01-04	Blume, et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2019-02-19
	First Named Inventor	Steven A. Roberts
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A12875-088356

	9	6078891	A	2000-06-20	Riordan, et al.	
	10	5832458	A	1998-11-03	Jones	
	11	9208461	B2	2015-12-08	Arzumanyan, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100070376	A1	2010-03-18	Proud, et al.	
	2	20110196754	A1	2011-08-11	Proud, et al.	
	3	20030016550	A1	2003-01-23	Rotman, et al.	
	4	20070100728	A1	2007-05-03	Rotman, et al.	
	5	20100076813	A1	2010-03-25	Ghosh, et al.	
	6	20090006151	A1	2009-01-01	Zargham, et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2019-02-19
	First Named Inventor	Steven A. Roberts
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A12875-088356

	7	20070050229	A1	2007-03-01	Tatro, et al.	
	8	20060151598	A1	2006-07-13	Chen, et al.	
	9	20020026348	A1	2002-02-28	Fowler, et al.	
	10	20070055597	A1	2007-03-08	Patel, et al.	
	11	20030216881	A1	2003-11-20	Tillman	
	12	20100010905	A1	2010-01-14	Arzumanyan, et al.	
	13	20110087519	A1	2011-04-14	Fordyce, III et al.	
	14	20100280881	A1	2010-11-04	Faith, et al.	
	15	20120109709	A1	2012-05-03	Fordyce, III et al.	
	16	20140372184	A1	2014-12-18	Blumenthal	
	17	20160247111	A1	2016-08-25	Blumenthal	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at [illegible] or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2019-02-19
First Named Inventor	Steven A. Roberts
Art Unit	
Examiner Name	
Attorney Docket Number	A12875-088356

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jeffrey B. Fabian/	Date (YYYY-MM-DD)	2019-02-19
Name/Print	Jeffrey B. Fabian	Registration Number	70164

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

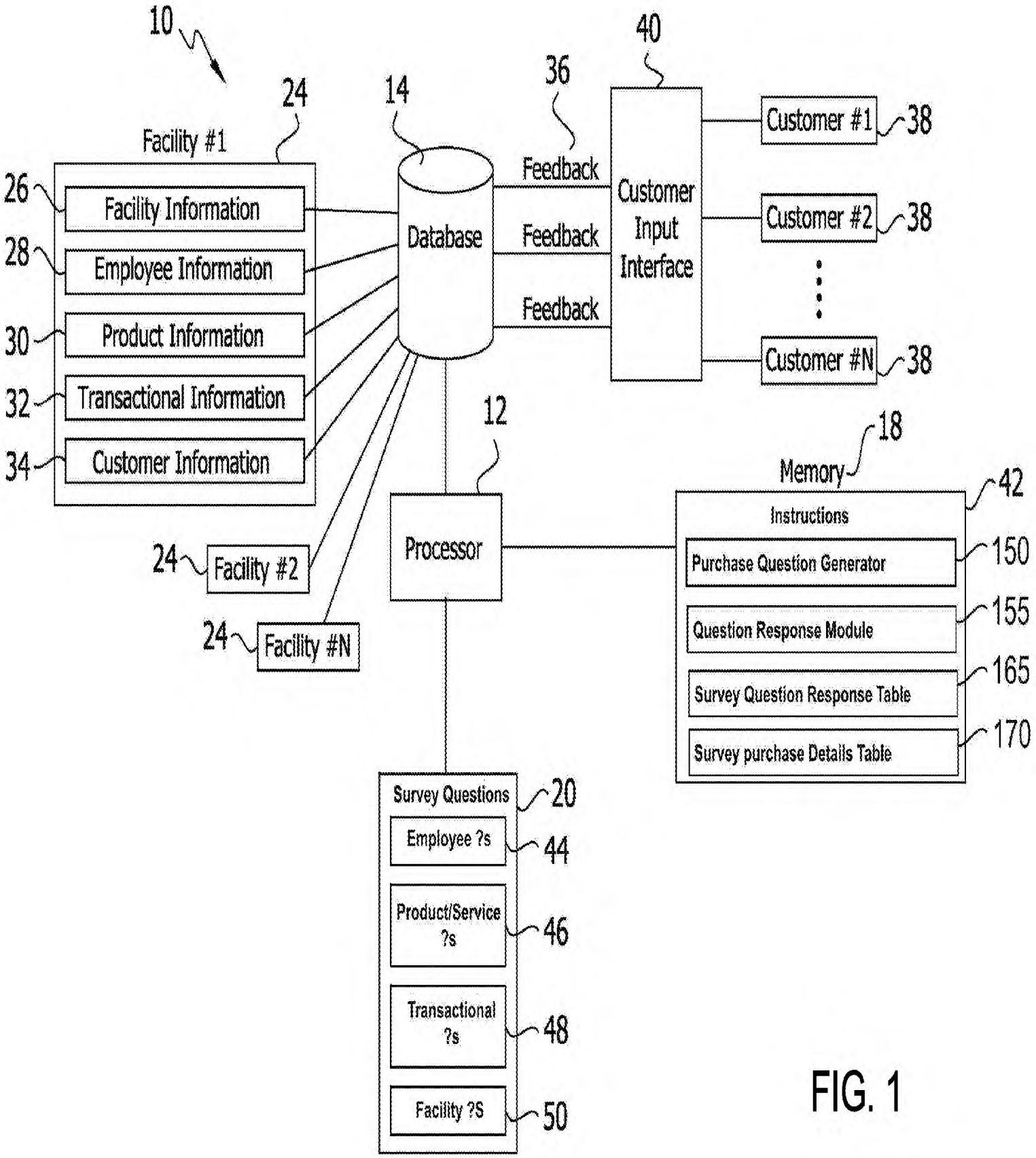

10
24
Facility #1
26
Facility Information
28
Employee Information
30
Product Information
32
Transactional Information
34
Customer Information
14
Database
36
Feedback
Feedback
Feedback
40
Customer Input Interface
Customer #1
38
Customer #2
38
Customer #N
38
12
Processor
18
Memory
42
Instructions
Purchase Question Generator
150
Question Response Module
155
Survey Question Response Table
165
Survey purchase Details Table
170
24
Facility #2
24
Facility #N
Survey Questions
20
Employee ?s
44
Product/Service ?s
46
Transactional ?s
48
Facility ?S
50

FIG. 1

FIG. 2

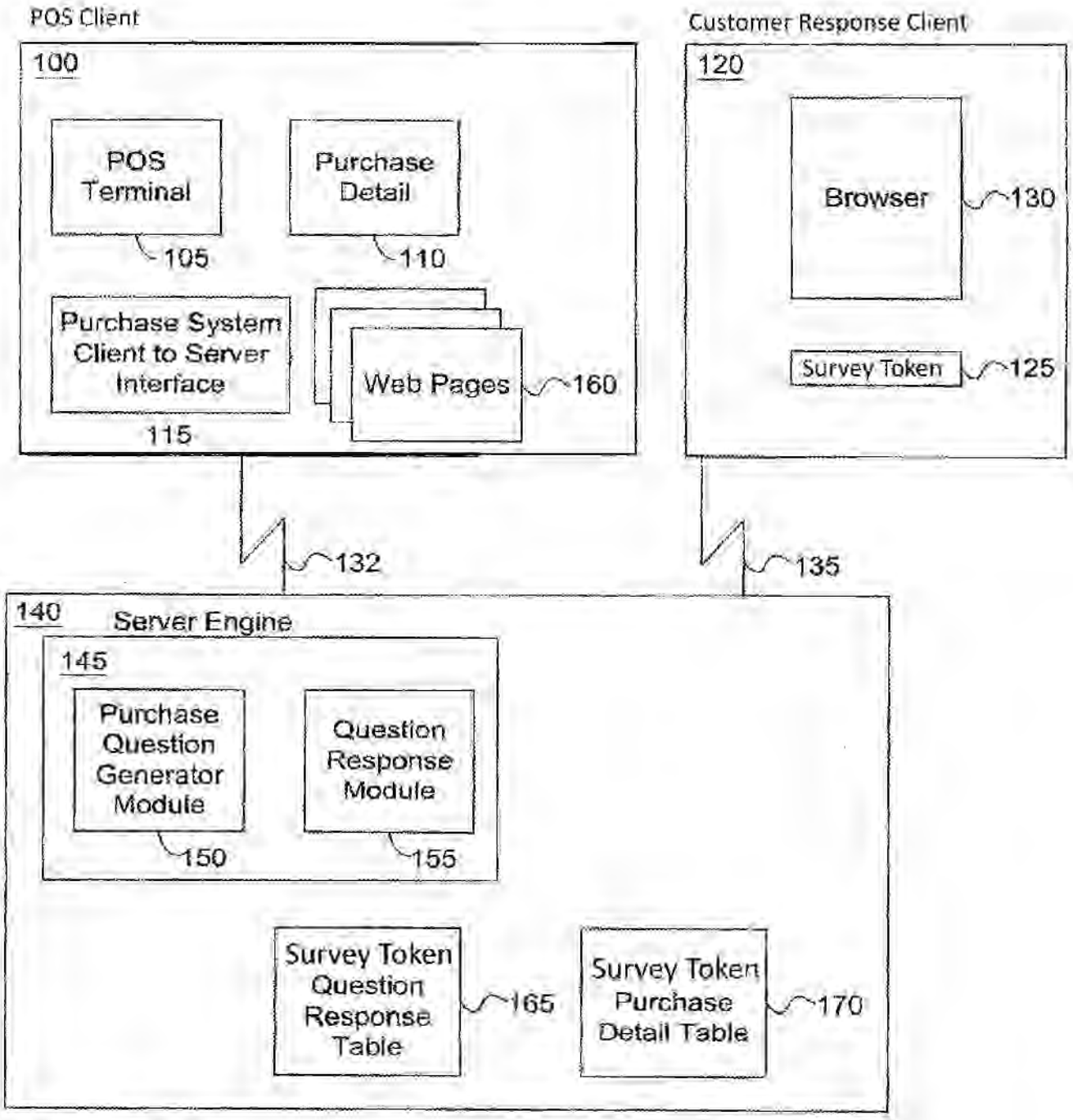

POS Client
100
POS Terminal
105
Purchase Detail
110
Purchase System Client to Server Interface
115
Web Pages
160
Customer Response Client
120
Browser
130
Survey Token
125
132
135
140
Server Engine
145
Purchase Question Generator Module
150
Question Response Module
155
Survey Token Question Response Table
165
Survey Token Purchase Detail Table
170

FIG. 3

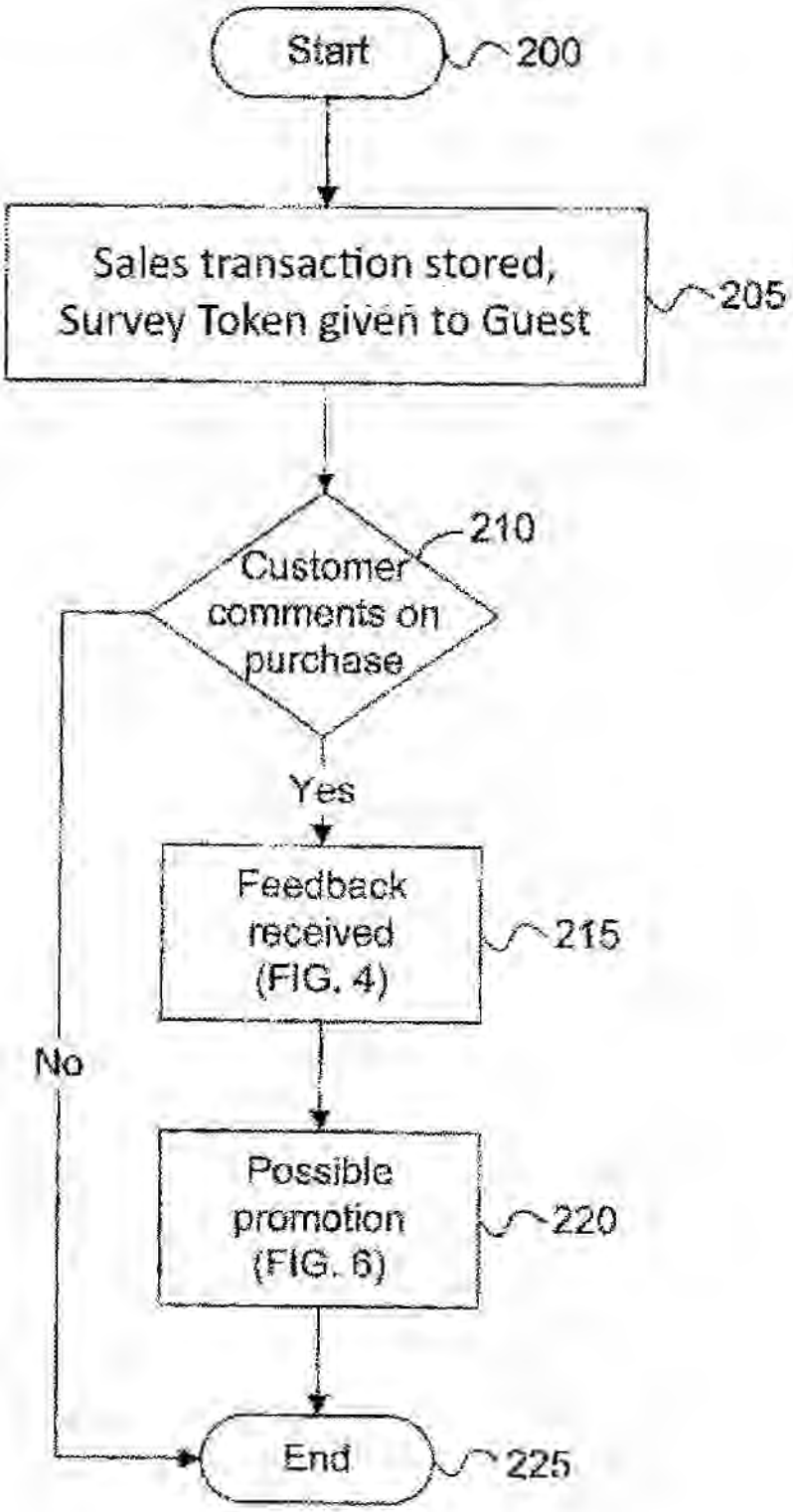

Start
200
Sales transaction stored, Survey Token given to Guest
205
210
Customer comments on purchase
Yes
No
Feedback received (FIG. 4)
215
Possible promotion (FIG. 6)
220
End
225

FIG. 4

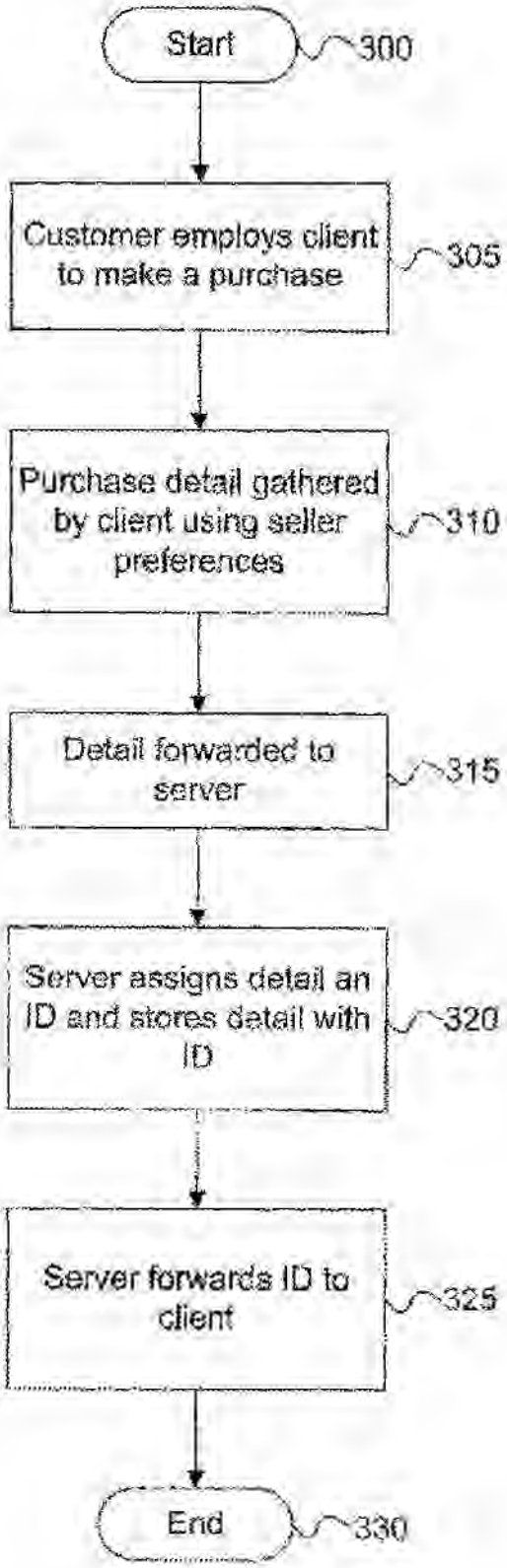

Start
300
Customer employs client to make a purchase
305
Purchase detail gathered by client using seller preferences
310
Detail forwarded to server
315
Server assigns detail an ID and stores detail with ID
320
Server forwards ID to client
325
End
330

FIG. 5

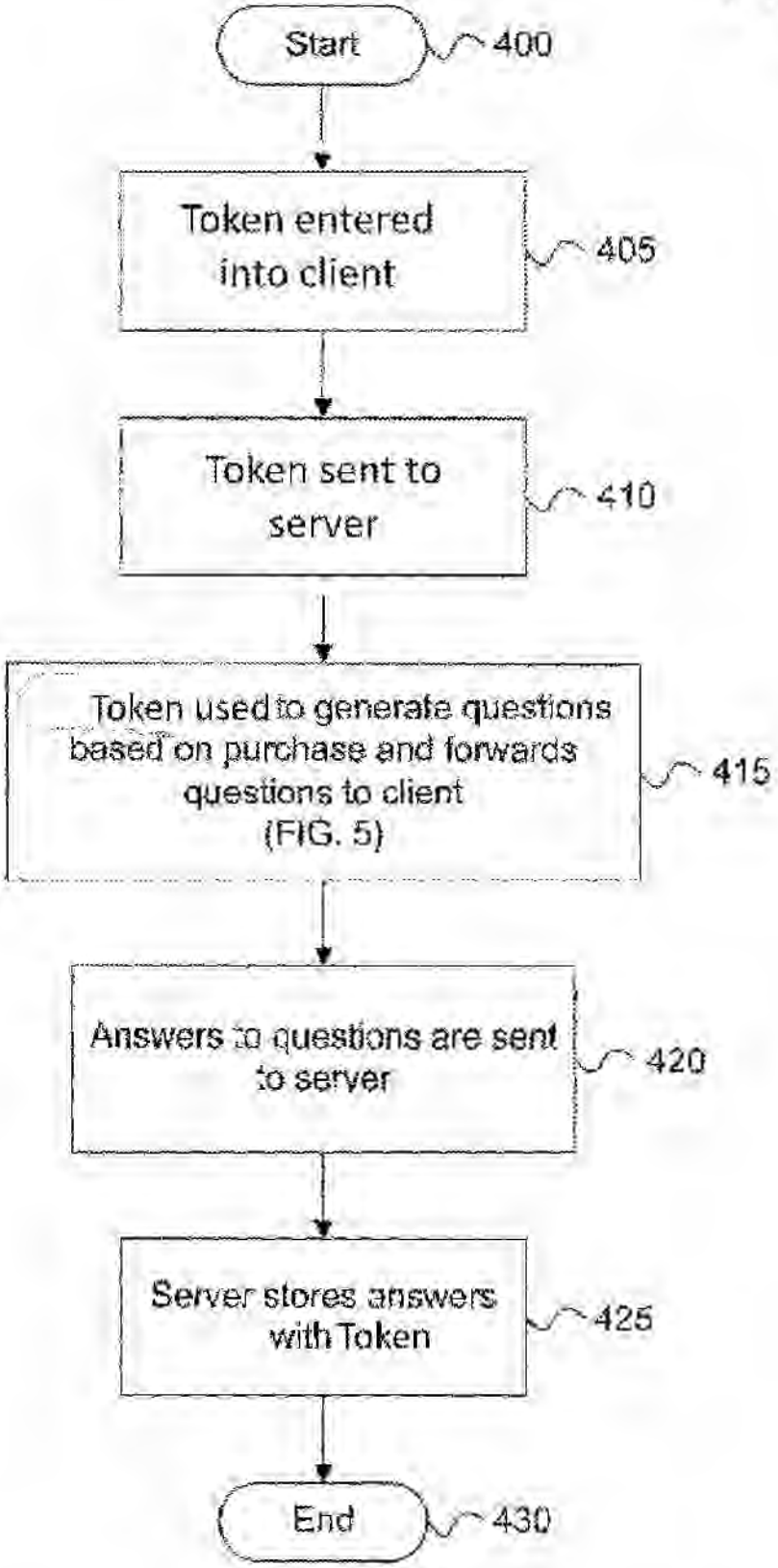

Start
400
Token entered into client
405
Token sent to server
410
Token used to generate questions based on purchase and forwards questions to client (FIG. 5)
415
Answers to questions are sent to server
420
Server stores answers with Token
425
End
430

FIG. 6

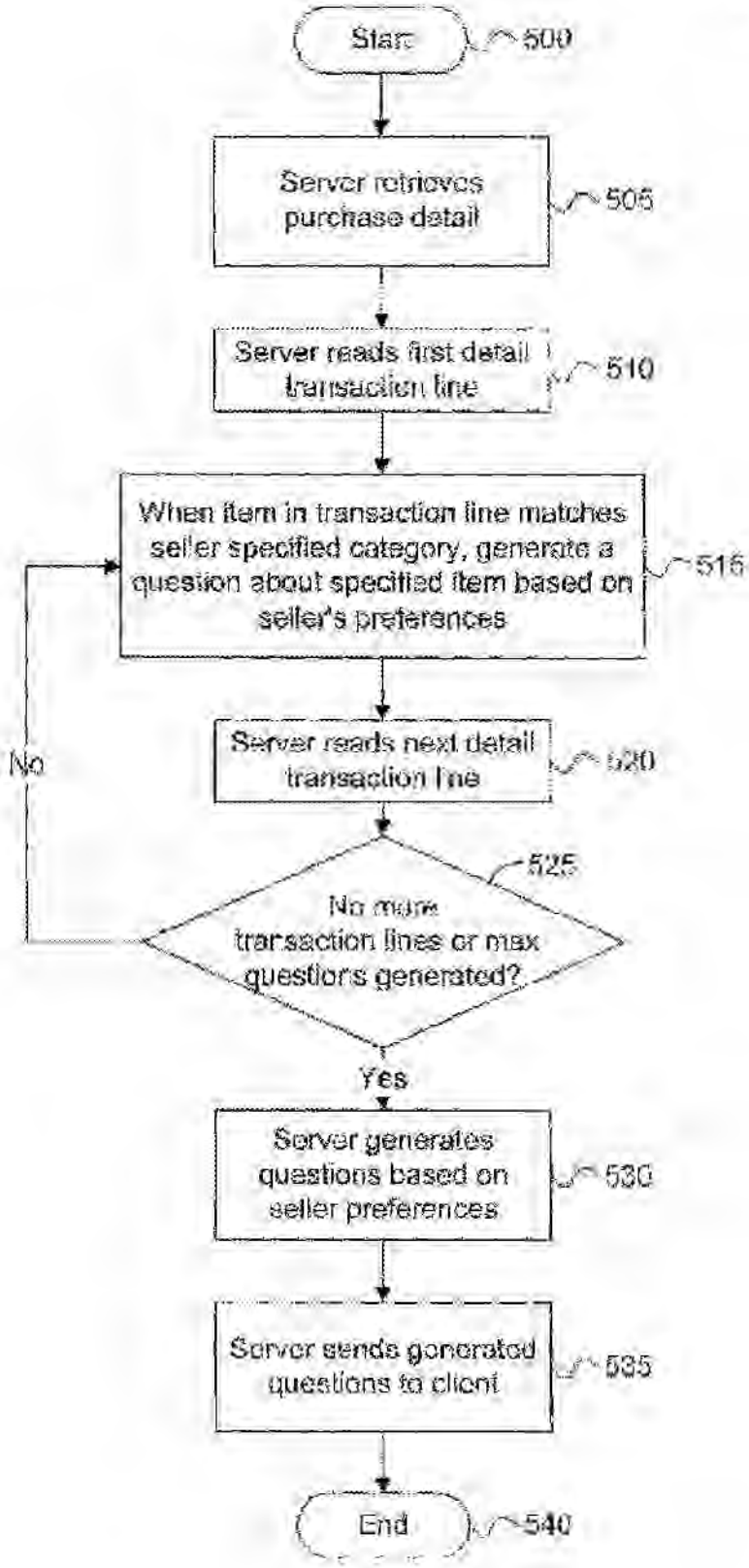

Start
500
Server retrieves purchase detail
505
Server reads first detail transaction line
510
When item in transaction line matches seller specified category, generate a question about specified item based on seller's preferences
515
Server reads next detail transaction line
520
No
No more transaction lines or max questions generated?
525
Yes
Server generates questions based on seller preferences
530
Server sends generated questions to client
535
End
540

FIG. 7

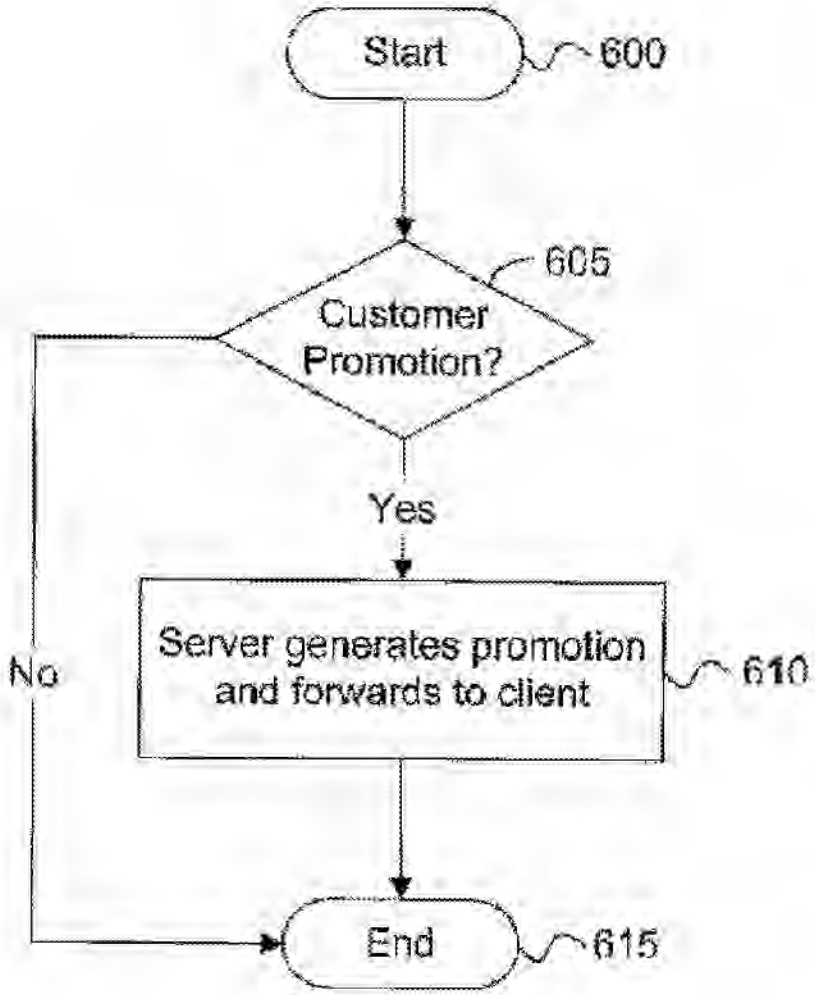

Start
600
605
Customer Promotion?
Yes
No
Server generates promotion and forwards to client
610
End
615

FIG. 8

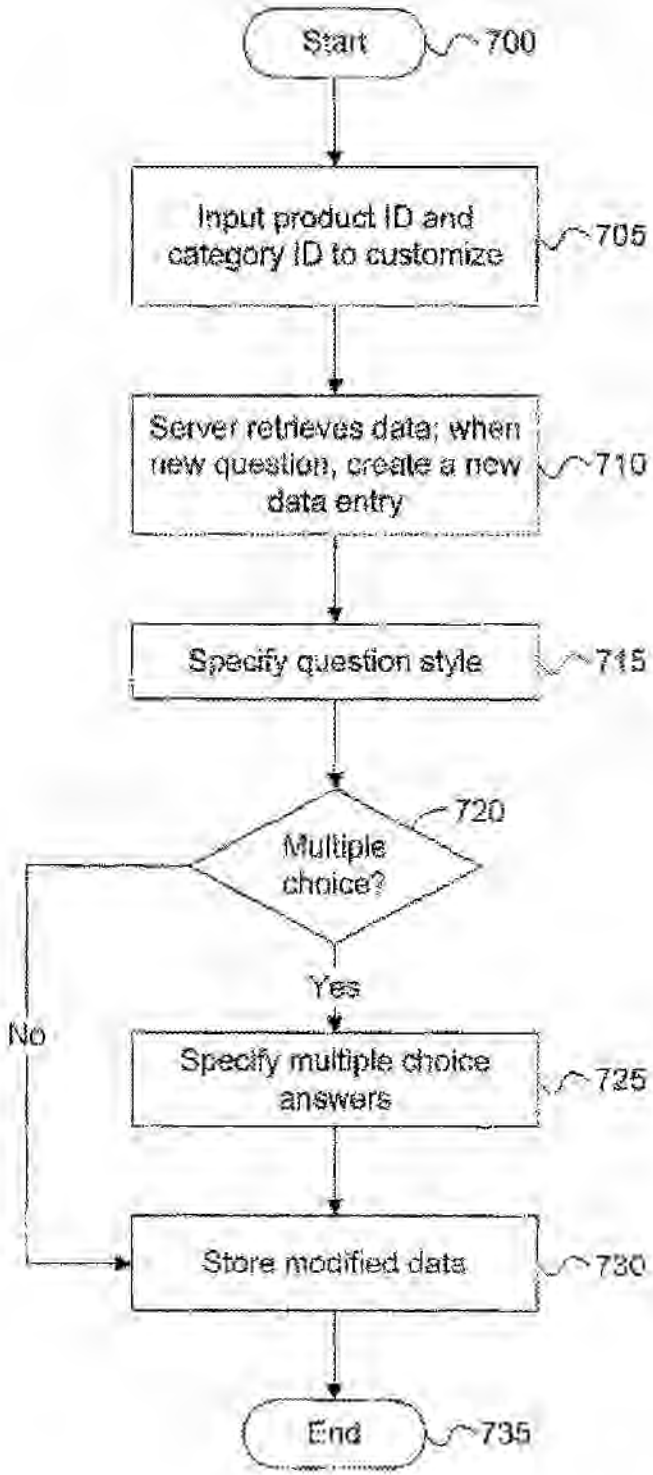

Start
700
Input product ID and category ID to customize
705
Server retrieves data; when new question, create a new data entry
710
Specify question style
715
Multiple choice?
720
Yes
No
Specify multiple choice answers
725
Store modified data
730
End
735

FIG. 9


Did you enjoy your boneless wings?
No
Not Really
Yes
Very Good
Great!!
Did you enjoy your Taco Salad?
Very Bad
Not Good
Acceptable
Good
Great!!
How was your server, Tiffany?
Very Bad
Not Good
Acceptable
Good
Great!!
Will you return?
Yes
No
Done
810

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/997,434

filed on January 15, 2016.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Drew Pelaubet Date (Optional): _____

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/997,434

filed on January 15, 2016

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Steven A. Roberts Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	TRANSACTION SPECIFIC CUSTOMER SURVEY SYSTEM
First Named Inventor/Applicant Name:	Steven A. Roberts
Filer:	Jeffrey Bruce Fabian/Cherise Christianson
Attorney Docket Number:	A12875-088356

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	785

Electronic Acknowledgement Receipt

EFS ID:	35190146
Application Number:	16279387
International Application Number:	
Confirmation Number:	6934
Title of Invention:	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM
First Named Inventor/Applicant Name:	Steven A. Roberts
Customer Number:	57838
Filer:	Jeffrey Bruce Fabian/Charise Christianson
Filer Authorized By:	Jeffrey Bruce Fabian
Attorney Docket Number:	A12875-088856
Receipt Date:	19-FEB-2019
Filing Date:	
Time Stamp:	15:45:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	5785
RAM confirmation Number	022019INTEFSW00002614505605
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Continuation_Guest_Survey_NonProvisional_Application.pdf	346006 2f1a6[illegible]0f1773f0453[illegible]	yes	54

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	44
	Claims	45	53
	Abstract	54	54

Warnings:

Information:

2	Application Data Sheet	Continuation_ADS.pdf	130609 d88bc[illegible]f0d5	no	8

Warnings:

Information:

This is not an USPTO supplied ADS fillable form

3	Information Disclosure Statement (IDS) Form (SB08)	IDS_Continuation.pdf	48938 52948[illegible]1d1[illegible]	no	6

Warnings:

Information:

This is not an USPTO supplied IDS fillable form

4	Drawings-only black and white line drawings	Drawings_Continuation.pdf	2123606 f77a[illegible]e4bb	no	9

Warnings:

Information:

5	Oath or Declaration filed	OATH_Peloubet.pdf	126038	no	1
Warnings:					
Information:					
6	Oath or Declaration filed	Oath_Roberts.pdf	126453	no	1
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	35235	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2936895		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[001] This application is a non-provisional of co-pending U.S. Non-provisional Application 14/997,434 filed January 15, 2016, which application is incorporated herein by reference.

TECHNICAL FIELD

[002] The present invention relates to a computer method and system for receiving customer feedback and information relating to a purchase, and more particularly, automatically generating a particular questionnaire for each purchase and linking the questionnaire results to transaction data.

BACKGROUND

[003] In any business, keeping customers satisfied is critical. Many techniques have been used to determine the level of customer satisfaction. One technique provides for analyzing sales histories and related product matrices. However, only limited information is typically gathered from sales histories. For example, while analyzing sales history for a particular product or group of products may provide information about which products are beginning to weaken in sales, little if any information is provided about why particular products are slowing in sales. Furthermore, although sales history may provide information about regional buying trends, it usually cannot indicate why a particular customer was dissatisfied.

[004] Getting customer response through the use of generic surveys has several disadvantages. First, surveys tend to be impersonal and ask general questions such as "How was your meal?" or "Would you shop here again?" that are not unique to a particular customer's experience. Second, surveys are often unnecessarily cumbersome to complete. For example, a survey may ask for the product name, identifier (survey token), serial number, store purchased

from, purchase price, purchase date, and a host of other questions unrelated to a particular customer's feedback. While the answers to these questions may be important to determine which product or service the customer is commenting on, a customer looking over this type of survey often determines that too much work must be done that is unrelated to their particular transaction and foregoes answering any of the questions in the survey.

[005] Many merchants, such as retail establishments, restaurants and other service providers, use modern Point-of-Sale (POS) systems that capture rich details around their customers' purchasing activity. This information, herein referred to as a customer-check, receipt, bill or simply check, however, has never been made available for the customer to interact with in terms of survey and satisfaction. With most POS systems, check-level data can include: the server or cashier, the date and time of service, the check duration, the table, the location, the mode, and each item ordered on the check plus modifications, comps, etc. applied to the check – this is *rich* data to the customer. Other systems provide customer satisfaction surveys but they ask only a pre-determined set of questions and rarely (if ever) provide actual feedback on the customers' specific experience. To get check-level survey information many businesses hire "Secret Shoppers" (secret only in that the merchant does not know they are professional consumer/survey takers) to provide feedback on service, product purchases, and experience.

[006] What is needed is a system that allows customers to provide valuable feedback for merchants not only through pre-set survey template(s), but also in obtaining detailed feedback on the customer's specific experience such as the actual items sold, the server, the table, the time of day, and more.

SUMMARY

[007] The invention includes method and system for automatically generating context-based survey questions predicated on the customers' actual purchase experience with the merchant, thus eliminating for the customer the need to respond to obvious, redundant, and even irrelevant questions, and providing to the merchant customer feedback directly bound to the actual purchase event and correlating data. Purchase information is stored at the time of purchase and the customer is given an identifier for the purchase. Then, at the customer's convenience, either at the point of sale or through a networked computer, the customer can provide responses to questions that are selectively and automatically generated based on the items purchased, or other definable attributes associated with the sale, and based upon configurable preferences of the merchant. Survey questions are displayed and feedback responses are stored, analyzed and associated with purchase information in real time.

[008] In accordance with the present invention, there is provided a method and system for automatically generating questions, receiving customer feedback, and associating the feedback with purchase information. With this invention, purchase information is stored at the time of purchase and the customer is given a survey token correlating to the purchase. Then, at the customer's convenience, either at the point of sale or through any web-enabled device, the customer can provide feedback to questions that specifically relate to the items purchased. This feedback is then stored, associated with the purchase information, and immediately available for analysis.

[009] Specifically, in accordance with the present invention, there is provided a method of providing a web-service (WS) that allows merchants, such as retailers and service providers, to integrate a check-level survey module into their own branded web-site. This WS feature allows customers to participate in a survey within the merchant's web-site and to interact with their

check details and other survey features being delivered to the merchant web-site using a Customer Survey Module (CSM or GSM (Guest Survey Module)) web-service as the data-integration and storage platform.

[0010] The invention may be implemented as a computer process, a computing system or as an article of manufacture such as a computer program product or computer readable media. The computer program product may be instructions for executing a computer process encoded on a computer storage media readable by a computer system. The computer program product may also be instructions for executing a computer process encoded on a propagated signal on a carrier readable by a computing system.

[0011] These and various other features as well as advantages, which characterize the present invention, will be apparent from a reading of the following detailed description and a review of the associated drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a block diagram of a system according to one embodiment of the invention.

[0013] FIG. 2 shows a block diagram for a system for receiving customer feedback in a GSM-Web Services configuration;

[0014] FIG. 3 illustrates a flow chart for generating questions and receiving feedback related to a purchase;

[0015] FIG. 4 illustrates a flow chart for gathering information relating to a purchase and associating a survey token with the purchase;

[0016] FIG. 5 shows a flow chart for automatically gathering feedback associated with a purchase;

[0017] FIG. 6 illustrates a flow chart for automatically generating questions for a purchase;

[0018] FIG. 7 illustrates a flow chart for automatically generating promotions or other special offers to reward customer feedback;

[0019] FIG. 8 shows a flow chart for specifying merchant preferences for reporting and/or for questions automatically generated for purchases;

[0020] FIG. 9 shows an exemplary questionnaire that includes a list of feedback questions that could be asked of a customer; and

DETAILED DESCRIPTION

[0021] In the following detailed description of exemplary embodiments of the invention, reference is made to the accompanied drawings, which form a part hereof, and which are shown by way of illustration, specific exemplary embodiments of which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[0022] The inventive survey system is described below. For the sake of illustration a scenario involving a customary transaction at a dining establishment is presented. The invention, however, is not limited to such transactions. As one will appreciate after reading the following description, the inventive system has equal utility in other commercial transactions including, but not limited to, retail, wholesale, online sales, hospitality, hotel, fine dining, fast food and other product or service transactions

[0023] FIG. 1 is a block diagram of a system **10** according to one embodiment of the invention. The system **10** combines product/service, transaction, employee, team and facility

data and customers' experiences during commercial transactions to provide various metrics associated with the performance of a particular employee, team, store(s)/region (e.g., a facility), for example, metrics related to customer feedback, employee performance metrics, and process improvement metrics for the facility. As used herein, instructions and/or rules mean computer executable instructions. It should also be noted that the term "customer" is synonymous with the term "guest."

[0024] System **10** includes a processor **12** connected to a database **14**, a set of computer-executable instructions stored in a memory **18**, a plurality of survey questions **20**, and an interactive customer interface **40**. Database **14** can store information from multiple facilities **24**. As shown, there may be more than one facility **24** (e.g., Facility #1, Facility #2, Facility #N). For example, Database **14** stores facility information **26** regarding an identity of a particular facility; employee information **28** regarding the identity of each employee at the facility and their performance over a period of time; product/service information **30** identifying products/services available for purchase at each facility; transactional information **32** regarding the amount of product/services sold to a particular customer during a particular transaction, metrics regarding sales quota, and the like; and customer information 34 such as a customer's identity, e-mail address, enrollment in a loyalty program and other particulars.

[0025] In addition, Database **14** is populated with customer feedback information **36** regarding a commercial transaction made by the customer, via survey, after purchasing a product/service at one of the facilities **24**. For example, a customer who has purchased a product/service at a facility **24** can access a customer interface **40** through various modalities (e.g., kiosk, mobile application or website) to provide feedback **36** (e.g., via surveys) regarding the specific commercial transaction. In general, as used herein, an interface is a

component of computer executable instructions stored in a tangible, non-transitory medium and executed by processor 12 to present a display of information related to the interface allowing someone to view and/or interact with the presented information.

[0026] Processor **12** executes computer-executable instructions that are stored in memory **18**, which instruct processor **12** to utilize the facility information **26**, employee information **28**, product information **30**, and transactional information **32** for each facility **24** in order to generate invitations for customers **38** to respond to surveys **40** regarding their transactions. For example, in one embodiment, processor **12** executes the computer-executable instructions for processing the facility data **24** to determine which of the facility's customers **38** will receive a survey. The customer feedback **36** is stored in Database **14** and related to the customer information **34** identifying a particular customer **38**.

[0027] In a preferred embodiment, processor **12** executes the computer-executable instructions for processing the facility data **24** to identify the facility's customers **38**. Invitations to the survey can be transmitted by email or through a mobile application on the customer's electronic device. Alternatively, the URL of a website through which the customer can access the survey can be printed on the customers transaction receipt. The customer feedback **36** is stored in Database **14** and related to the customer information **34** identifying a particular customer **38**. Further, processor **12** executes computer-executable instructions for processing transaction information **32** to determine the composition of the survey to be delivered to customer.

[0028] All data groups can be organized into smart groups. A smart group is a collection of data classes according to definable and changeable customer defined, or auto generated criteria. For example, Facilities can be organized into a plurality of smart groups. The criteria for a facility smart group could be, for example, square footage. Other illustrative criteria could be

facilities located in shopping malls, or distance from an interstate. Any objective criteria are suitable for defining a smart group.

[0029] Smart groups can also be used for other data categories as well. Employees, for example, can be placed in smart groups based on location, seniority, title, status, education, attendance record or demographic information. All data categories are capable of being placed in smart groups. Accordingly, and using FIG. 1 as an example, smart groups can be meta-data references to sets of facility information **26**, employee information **28**, product information **30**, transactional information **32** and customer information **34**. Similarly smart groups can be larger meta-data references to sets of facilities **24**.

[0030] FIG. 2 shows a block diagram for a system for receiving customer feedback in a client/server configuration. POS client **100** includes point of sales (POS) terminal **105**, purchase detail component **110**, purchase system client to server interface **115** and web pages **160**. POS terminal **105** represents anywhere a purchase takes place and includes on-line purchasing, restaurants, grocery stores, department stores, and other places where goods or services are purchased. Purchase detail component **110** collects transaction information that may include price, quantity, and name of each item purchased, time and date of purchase, employees on duty, and/or any other relevant information associated with a purchase. For example, when a customer uses a loyalty card or some other means of identification during the purchase, purchase detail component **110** may collect a survey token that identifies the particular customer. As used herein a "token" can be any identifying information that is unique to a particular customer or transaction. In the case of a customer token, for example, the token can be a unique identifier generated at the point of sale or the token can be a loyalty program account number. The customer token can also be a name, email address or the like. The token can be generated by the

point of sale system or can be connected to the merchant's customer records management (CRM) software and/or loyalty program database.

[0031] The token can also be a composite of several different pieces of data. For example, the token can comprise a facility identification number, transaction number and transaction date. Similarly the token can comprise a facility identification number, register number and employee identification. These and many other data points are often present on checks/receipts and can be used in combination as a token.

[0032] All data received from a vendor is normalized for full data alignment. For example, continuing with the example of a restaurant transaction, different vendors convey the same information differently. A hamburger on a check from a first vendor may state "Hamburger" while a second vendor may list it as "HMBRG" while a third vendor may list the item under a name such as "Super Bacon Burger."

[0033] Purchase system client to server interface **115** provides an interface between purchase system client **100** and server **140**. Purchase system client **100**communicates with server **140** through communication link **132**.

[0034] Server **140** includes server engine **145**, response table**165**, and purchase detail table **170**. Server engine **145** includes purchase question generator module **150** and question response module **155**. Server **140** includes communications link **132** to purchase system client **100** and communication link **135** to customer response client **120**. Purchase question generator module **150** generates questions based on purchase information stored in purchase detail table **170** and preference data associated with merchant preferences. Question response module **155** receives customer responses from customer response client **120**. Web pages **160** enable customer response client **120** to include a web browser that provides a

customizable interface for collecting customer responses (feedback). Response table **165** stores customer responses and a survey token for referencing purchase detail table **170**. Purchase detail table **170** stores purchase detail collected on purchase system client **100** and associates a survey token and possibly a customer survey token with each entry.

[0035] In some circumstances, not all purchase detail collected may be stored in purchase detail table **170**. For example, a merchant may pre-determine that the server should not ask any questions related to certain items. Rather than consume disk space storing purchase detail related to the items, the server may omit storing the items altogether. Alternatively, a purchase detail line may be deleted from purchase detail table **170** when it is determined that it is no longer needed. For example, certain purchase detail transaction lines may trigger purchase generator module **150** to generate a question, while other transaction lines may not cause a question to be generated. In one embodiment, during these scenarios, the transaction lines not triggering a question are deleted to conserve storage space and/or decrease access time to the other remaining transaction lines.

[0036] In a preferred embodiment, however, the check data is stored so that the survey can be contrasted with all of the check details. It is possible, however, to ignore some check items, as determined by the user's discretion (although they are still stored) when generating survey questions. The existence or absence of a product/item, in the purchase table can be a factor to trigger a survey question.

[0037] Customer response client **120** is comprised of browser **130** and survey token **125**. It is appreciated that browser **130** may be a web browser, application program, or any device capable of reading web pages. Unique survey token **125** is typically the same survey token given to the customer at the time of the sale and associated with the customer's purchase in purchase detail

table **170**. Before submitting responses, a customer enters this survey token to identify the particular purchase for which the responses will be given.

[0038] While entering the unique survey token to identify the purchase, the customer may optionally enter a user ID and password to identify the customer. This enables tracking of responses made by a particular customer. The purchasing behavior of the particular customer can be analyzed to provide a unique promotional experience. For example, a merchant could promote customer feedback by giving points or coupons to repeat customers who provide feedback regarding their purchasing experience. Alternatively, customer data can be captured through the use of a Website Contact Module (discussed below).

[0039] Purchase system client **100**, server **140**, and customer response client **120** may reside on the same electronic device or may reside on separate electronic devices.

[0040] Computing devices, such as the ones shown in FIG. 2, typically include at least some form of computer-readable media. Computer readable media can be any available media that can be accessed by the computing device. By way of example, computer-readable media might comprise computer storage media and communication media.

[0041] Computer storage media includes volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structure, program modules or other data. Computer storage media includes RAM, ROM, EPROM, flash memory or other memory technology, CD-ROM, digital versatile disk (DVD) or other optical storage or any other medium that can be used to store the desired information and that can be accessed by a computing device.

[0042] Communication media typically embodies computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or

other transport mechanism and includes any information delivery media. Combinations of any of the above should also be included within the scope of computer-readable media. Computer-readable media may also be referred to as computer program product.

[0043] FIG. 3 illustrates a flow chart for generating questions and receiving feedback related to a purchase. The process starts at block **200** when a purchase is made.

[0044] At block **205**, a purchase occurs as described in detail in conjunction with FIG. 4. Briefly stated, a customer makes a purchase, details regarding the purchase are stored, and a survey token identifying the purchase transaction is given to the customer. For example, referring to FIG. 2, a customer makes a purchase at POS terminal **105**. Purchase detail is sent to server **140**, and a survey token is generated and sent back to POS terminal **105** and given to the customer.

[0045] At block **210**, a determination is made as to whether as to whether a survey token is valid and a survey will be generated. When a survey is to be generated, the yes branch is followed and processing continues at block **215**. Otherwise, the no branch is followed and processing continues at block **225**. It will be appreciated that feedback may be provided immediately after the transaction or any time thereafter.

[0046] At block **215**, feedback about a purchase is received as described in conjunction with FIG. 5. Briefly stated, a survey token associated with a purchase is entered into a client computer which forwards the survey token to a server. The server generates questions related to the purchase and forwards the questions to the client computer. The client computer receives the questions, solicits responses to the questions, and returns the responses to the server which then stores them. For example, referring to FIG. 2, a customer uses browser **130** to connect to

server **140** and to provide feedback regarding a purchase associated with unique survey token **125**.

[0047] In another embodiment, a server may pre-generate questions after the purchase details are forwarded to the server. Pre-generating questions may be done to move the generation of questions to off-peak compute times, to speed response when the customer provides feedback, or for other reasons. The generated questions may then be stored together with the survey token that is returned to the customer. When a user desires to provide feedback, the pre-generated questions may then be retrieved by the server and sent to the computer receiving feedback regarding the purchase.

[0048] At block **220**, a promotion may be generated. For example, a merchant may promote customer feedback by giving points or coupons to repeat customers who provide feedback regarding their purchasing experience. For example, referring to FIG. 2, server **140** generates a promotion and forwards it to customer response client **120**.

[0049] At block **225**, processing ends. At this point, details related to the purchase have been recorded. When feedback is received, this is also recorded and associated with the purchase. Both the purchase detail and the feedback may be immediately retrieved for analysis and reporting. A user may be rewarded when the server determines that a promotion is appropriate.

[0050] FIG. 4 illustrates a flow chart for gathering information relating to a purchase and associating a survey token with the purchase. The process starts at block **300** when the purchase is made.

[0051] At block **305**, a customer employs client hardware and/or software (hereinafter referred to as the client system) to make a purchase. Client hardware includes cash registers, personal computers, hand-held devices, multiprocessor systems, microprocessor-based or

programmable consumer electronics, network PCs, minicomputers, mainframe computers, and the like. Client software typically executes on client hardware and works in conjunction with the hardware to enable the customer to make the purchase and to perform various other functions described in conjunction with FIG. 4. For example, referring to FIG. 2, a customer employs purchase system client **100** to make a purchase.

[0052] At block **310**, purchase detail is collected by the client system. For example, referring to FIG. 2, purchase detail component **110** may collect price, quantity, and name of each item purchased, time of purchase, employees working during purchase, and a survey token identifying the customer. An advantage of collecting this information is that the customer does not have to re-enter the purchase information when providing feedback about the purchase. Another advantage is that information the customer may be unaware of and should not need to be concerned with may also be collected such as manager on duty, cashier, supervisor, employee, technician, etc.

[0053] Yet another advantage is that the purchase detail can be used to generate customized questionnaires automatically. For example, instead of asking "How was your food?" or "Would you recommend us to a friend?" the purchase detail can be used to ask "How was your foot-long meatball sub?," "Did you enjoy the view from room 107?" or "How was your server, Joan?" Such transaction-related questions may aid the customer in providing more accurate and relevant answers. Furthermore, because a customer is not required to fill in details regarding the purchase such as what they ate, what item they purchased, the time and date of the transaction, etc., the customer may determine that the questionnaire will not require too much time to complete and may be more willing to complete it.

[0054] At block **315**, the purchase detail is forwarded from the client system to a server. For example, referring to FIG. 2, purchase system client to server interface **115** sends the purchase detail to server **140**.

[0055] At block **320**, the server receives the purchase detail, assigns a survey token to the detail, and stores the purchase detail with the survey token for future access. This allows the server to retrieve the purchase detail when a client system identifies the purchase by giving the survey token. Typically, the survey token assigned will be unique with respect to other IDs stored. Over time, however, IDs may be reused. For example, after a purchase detail associated with a survey token is no longer needed, it may be deleted or archived. When the purchase detail is deleted or archived, the survey token may be available for use in identifying another purchase detail. For example, referring to FIG. 2, server **140** receives purchase detail from purchase system client to server interface **115**. Then, server **140** generates a survey token and stores the purchase detail with the survey token in detail table **170**.

[0056] At block **325**, the server sends the survey token to the client system. This allows the client system to give the survey token to a customer for use when the customer provides feedback. For example, referring to FIG. 2, server **140** sends purchase system client **100**the survey token.

[0057] At block **330**, processing ends. At this point, the client system has collected purchase detail and forwarded it to the server. The server has generated a survey token and stored the purchase detail with it for future use. Additionally, the server has sent the survey token to the client system so that it may give the survey token to the customer.

[0058] It will be appreciated that the client system may give the survey token to the customer in many ways, including displaying it for the customer to read, storing it in a file on a computer,

such as in a cookie, printing it on a bar code on a receipt or check given to the customer, encoding it on a loyalty card presented by the customer, encoding it on a ticket given to the customer, transmitting it to the customer through electronic mail, transmitting it to a wireless personal communication device, and the like.

[0059] In one embodiment of the invention, purchase detail is forwarded to the server at the time of the purchase. In another embodiment of the invention, purchase detail is forwarded in batches. When purchase detail is forwarded in batches, the survey token may be generated differently. When a customer is ready to complete a purchase transaction, typically, the customer desires to be finished as soon as possible. For example, when checking out of a grocery store a customer typically wants to pay for the items purchased and take the groceries to the car. When leaving a restaurant, a customer typically wants to pay the waiter or cashier and leave. When purchase details are sent as a batch, depending on the batch size and the number of customers, it may take several minutes or hours before a batch is sent. A customer would not likely wish to wait the minutes or hours for the batch to be sent and a survey token to be returned to the customer for use during feedback.

[0060] The wait for a survey token in a batched system may be avoided by having the client system generate a survey token immediately which it displays to the customer. Upon sending of the batched information, the client system would also send the survey token so that the server system could store the survey token given to the customer with the purchase made by the customer. In this embodiment of the invention, the server does not need to generate the survey token or send it back to the client because the client generated it. Many clients systems, however, may be active simultaneously. Without proper integration, the client systems may assign the same survey token to two different purchases. In light of this disclosure, it will be recognized

that in a batched system a method or system for avoiding or dealing with duplicate IDs may be required. One system, for example, for avoiding duplicate IDs is to assign each client a unique client survey token and to have the client embed its unique client survey token in IDs the client generates, thus creating IDs that uniquely identify purchases when multiple clients are employed in a batched system.

[0061] FIG. 5 shows a flow chart for automatically gathering feedback associated with a purchase. The process starts at block **400** when a user is ready to provide feedback regarding a purchase transaction.

[0062] At block **405**, a survey token is inputted into a customer response client. Inputting the survey token into the customer response client may be done in many ways, including entering the survey token on a keyboard, using a computer on which the survey token was stored as a cookie or otherwise, scanning a bar code, swiping a loyalty card containing the survey token, etc. For example, referring to FIG. 2, a customer uses customer response client **120** to input unique survey token **125** into browser **130**.

[0063] At block **410**, the customer response client forwards the survey token to the server. For example, referring to FIG. 2, customer response client **120** forwards unique survey token **125** to server **140**.

[0064] At block **415**, the server retrieves purchase detail associated with the survey token and generates questions for the purchase as described in detail in conjunction with FIG. 6. Briefly, the questions generated are related to the items purchased and preference data associated with merchant preferences. For example, referring to FIG. 2, server **140** uses the survey token to retrieve related purchase information in purchase detail table **170**. Then, purchase question

generator module **150** generates questions based on the detail retrieved. Typically, these questions are then formatted into web pages **160** which are then sent to browser **130**.

[0065] At block **420**, the questions are displayed to the customer and answers are collected. Then, the answers are sent to the server. When a customer does not answer one or more questions, the response(s) of not answering for the one or more questions may also be sent to the server. For example, referring to FIG. 2, browser **130** reads the questions on web pages**160** and displays them to the customer. The customer answers the questions by using browser **130** and indicates that the answers are completed. Then, browser **130** sends the answers to server **140** for use in question response module **155**. The answers may be sent one-at-a-time in real time to the server, or, alternatively, answers may be grouped together and sent to the server in batches.

[0066] At block **425**, the server stores the answers together with the survey token for future analysis. When the server stores the answers, they are immediately available for analysis. For example, referring to FIG. 2, server **140** stores the answers with the survey token in question response table **165**.

[0067] At block **430**, processing completes. At this point, questions related to a purchase have been generated, and feedback has been received and stored for analysis and reporting.

[0068] FIG. 6 illustrates a flow chart for automatically generating questions for a purchase. The process starts at block **500**when a user is ready to provide feedback regarding a purchase transaction.

[0069] At block **505**, the server locates purchase detail associated with the purchase that was previously stored on the server. The server typically retrieves the purchase detail by using a survey token supplied by the user. Usually, the survey token is associated with the purchase

detail previously stored on the server. For example, referring to FIG. 2, server **140** locates purchase detail associated with the survey token from purchase detail table **170**.

[0070] At block **510**, the server retrieves a first transaction line from the purchase detail the server previously located. A purchase may include many items and each item may be associated with a different transaction line. For example, a restaurant check may have appetizers, entrees and drinks each on separate transaction lines. Referring to FIG. 2, for example, server **140** reads a first transaction line from the purchase detail.

[0071] At block **515**, the transaction line is searched for merchant specified items. When an item in the transaction line matches a merchant's specified category, a question about the item may be generated depending on preference data associated with merchant preferences. The merchant may prefer to generate one type of question when alcohol is purchased and another type of question when soft drinks are purchased. For example, referring to FIG. 2, purchase question generator module **150** determines if an item in the retrieved transaction line matches a merchant specified category. When an item in the retrieved transaction line matches a merchant specified category, the purchase question generator module **150** may generate a question.

[0072] At block **520**, the server retrieves the next detail transaction line (if it exists) from the purchase detail. For example, referring to FIG. 2, server **140** reads the next transaction line from the purchase detail.

[0073] At block **525**, a determination is made as to whether either no more transaction lines exist for the purchase or whether a maximum number of questions have been generated regarding the purchase. When either of these conditions exists, the yes branch is followed to block **530**. Otherwise, the no branch is followed to block **515**. For example, referring to FIG. 2, server **140** determines when additional transaction lines exist for a purchase and purchase

question generator module **150**determines when the maximum number of questions has been generated.

[0074] At block **530**, the server generates additional questions based on preference data associated with merchant preferences. The merchant may prefer, for example, that a question be asked regarding the quality of service rendered to the customer in addition to other questions related to specific transaction lines. For example, referring to FIG. 2, purchase question generator module applies preference data associated with merchant preferences to add additional questions to be asked to the customer.

[0075] At block **535**, the server sends the generated questions to the client computer. The server may do so by populating the merchant's web pages **160** that the client computer accesses. For example, referring to FIG. 2, purchase question generator module **150** completes the list of questions to be asked and populates web pages **160** to be read by customer response client **120**.

[0076] At block **540**, processing ends. At this point, questions have been generated based on the items purchased and preference data associated with merchant preferences. These questions have been made available to the customer, typically in the form of web pages.

[0077] It will be appreciated that merchant preferences may cause question generation to depend on previous questions generated and responses received. For example, a merchant may prefer that a particular question no longer be generated when no or few customers queried respond to it. In addition, a merchant may prefer that a question that has been answered numerous times no longer be generated as a large enough sample has been generated for analysis. The merchant may specify that after the question has been answered a certain number of times that another question be asked instead of the question.

[0078] FIG. 7 illustrates a flow chart for automatically generating promotions to reward customer feedback. The process starts at block **600** when a user has provided feedback regarding a purchase transaction.

[0079] At block **605**, a determination is made as to whether a promotion should be generated. The determination may depend on many factors including how many questionnaires a customer has completed, advertising needs for a particular product, the feedback the customer provides, items in the purchase transaction, random generations calculated to promote customer feedback, and/or any other factor(s) a merchant prefers. For example, a positive determination to generate a promotion may occur when a customer provides feedback for a television (or other electronic device) for selected questions of a questionnaire. The system may determine, for example, that the customer should be given a coupon giving a discount on a selected DVD. When it is determined that a promotion should be generated, the yes branch is followed to block **610**. Otherwise, the no block is followed to block **615**.

[0080] At block **610**, the server generates a promotion and forwards it to a client computer to give to the customer. The client computer may prompt the customer to save the promotion for future use or to print a coupon. When the customer elects to save the promotion, it may be saved on the server and a survey token identifying the customer may be required. For example, referring to FIG. 2, server **140** generates a promotion and forwards it to customer response client **120**.

[0081] At block **615**, processing ends. At this point a promotion, when generated, has been forwarded to a client computer and given to the customer.

[0082] FIG. 8 shows a flow chart for specifying merchant preferences for reporting and/or for questions automatically generated for purchases. The process starts at block **700** when a user desires to set preferences.

[0083] At block **705**, the user inputs a product ID and a category ID. The product ID and category ID identify the product or products for which preferences will be set. For example, the user may enter a product ID identifying a type of steak and category ID identifying entrees. Referring to FIG. 2, for example, a user uses a client computer (not shown) to connect to server **140** and enters a product ID and a category ID.

[0084] At block **710**, the server retrieves preference data related to the product ID and the category ID. When the user is adding a new question, a new data entry is added in a preference table. When the user is modifying an existing question, the existing data entry is located. For example, referring to FIG. 2, server **140** retrieves or adds an entry to a merchant preferences table (not shown).

[0085] At block **715**, the user specifies a question style. Question styles include multiple choice, yes/no, fill in the blank, rating scales, free form text responses, and the like. Question styles include questions that could be asked in a paper survey. For example, referring to FIG. 2, server **140** receives a selection as to which question style is desired.

[0086] At block **720**, a determination is made as to whether the question style selected is multiple choices. When it is, the yes branch is followed to block **725**. Otherwise, the no branch is followed to block **730**. For example, referring to FIG. 2, server**140** determines whether a multiple choice question style has been selected.

[0087] At block **725**, choices for a multiple choice question are selected. These choices are stored for use when the server is generating multiple choice questions regarding a purchase. For

example, referring to FIG. 2, server **140** prompts the user for choices allowed in a multiple choice question.

[0088] At block **730**, the question style and information about the question are stored so that the server can access the information when it is generating questions regarding a purchase. Information about the question includes such things as product ID, category ID, text used for the question, where to insert an item description or name, and other information relevant to generating the question. For example, referring to FIG. 2, server **140** stores information about the question and the question style in a merchant preferences database (not shown) for use when purchase question generator module **145**generates questions.

[0089] At block **735**, processing ends. At this point a question style and information about a question have been stored on the server for use during automatic question generation. A user setting merchant preferences may add or change questions by repeating the process above.

[0090] FIG. 9 shows an exemplary questionnaire that includes a list of feedback questions that could be asked of a customer. Questions **810** illustrate customer feedback questions with the names of exemplary items purchased shown in italics along with multiple choice responses. It will be appreciated that the third and fourth feedback questions, "How was your service?" and "Will you return?" may be generated based on the preference of a merchant and may not be related to the actual items purchased.

[0091] The questions shown in FIG. 9 represent only a sample of questions that may be asked of a customer. Other question styles include star ratings, numerical ratings, fill in the blank, quality of service ratings, free form text responses, and the like.

[0092] An incentive may be provided for answering a questionnaire regarding a purchase. Illustrative incentives may include an offer for a 20% discount at the customer's next meal at

Joe's. It will be appreciated that several different incentive programs could be used to encourage a customer to provide responses to a survey.

[0093] The various embodiments of the invention may be implemented as a sequence of computer implemented steps or program modules running on a computing system and/or as interconnected machine logic circuits or circuit modules within the computing system. The implementation is a matter of choice dependent on the performance requirements of the computing system implementing the invention. In light of this disclosure, it will be recognized by one skilled in the art that the functions and operation of the various embodiments disclosed may be implemented in software, in firmware, in special purpose digital logic, or any combination thereof without deviating from the spirit and scope of the present invention as recited within the claims attached hereto.

[0094] The above specification, examples and data provide a complete description of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

[0095] *Examples*

[0096] The following illustrative embodiments of individual modules can be implemented as a computer program product for use with a computer system. Such implementations may include a series of computer instructions fixed either on a tangible medium, such as a computer readable medium (e.g., a diskette, CD-ROM, ROM, or fixed disk) or transmittable to a computer system, via a modem or other interface device, such as a communications adapter connected to a network over a medium. The medium may be either a tangible medium (e.g., optical or electrical communications lines) or a medium implemented with wireless techniques (e.g., microwave, infrared or other transmission techniques). The series of computer instructions embodies all or

part of the functionality previously described herein. Those skilled in the art should appreciate that such computer instructions can be written in a number of programming languages for use with many computer architectures or operating systems. Furthermore, such instructions may be stored in any memory device, such as semiconductor, magnetic, optical or other memory devices, and may be transmitted using any communications technology, such as optical, infrared, microwave, or other transmission technologies. It is expected that such a computer program product may be distributed as a removable medium with accompanying printed or electronic documentation (e.g., shrink wrapped software), preloaded with a computer system (e.g., on system ROM or fixed disk), or distributed from a server over the network (e.g., the Internet or World Wide Web). Of course, some embodiments of the invention may be implemented as a combination of both software (e.g., a computer program product) and hardware. Still other embodiments of the invention may be implemented as entirely hardware, or entirely software (e.g., a computer program product).

[0097] Other features and advantages of the present embodiment will become apparent to those skilled in the art from the following detailed description. It is to be understood, however, that the detailed description above and specific examples below, while indicating preferred embodiments of the present embodiment, are given by way of illustration and not limitation. Many changes and modifications within the scope of the embodiments disclosed herein may be made without departing from the spirit thereof, and such embodiments include all such modifications.

[0098] *WS-Based GSM*

[0099] The WS-based Customer Survey Module (GSM) of the current invention allows merchants to integrate a GSM into their branded website allowing integration to both survey

templates and actual check details. All administration of the GSM occurs within a Data Collection Handler (DCH) smart client. The WS features are implemented as a multi-unit (MU) role based services; this allowing an MU login to be setup by survey smart group scope for either centralization or decentralization based upon MU login scope to units.

[00100] The challenge of this type of survey concept is to get the customer to volunteer to complete a survey. One solution is to offer limited support for incentives (such as special offers described below). Another solution is to "gamify" the survey. For example, providing a bingo letter/number that the user can then use to start filling in a bingo card, and the winner gets a better prize. In order to fill the bingo card, the customer is encouraged to come back for another purchase and survey round.

[00101] At the time of the sale, the POS provides a printed survey token (either directly on the check/receipt or on separate piece of paper) that allows the system to retrieve check data in order to complete a survey. Additionally, check information and the token can be provided electronically such as through email or the use of a mobile application. The survey invitation begins with a survey token being generated by the POS, this token is preferably a concatenation of STORE+DATE+CHECK, and presented on the customer check. These three (3) key informational components (unit, check-date, and check number) are used by the DCH to retrieve, with a high level of confidence, information about the check.

[00102] The structure of the token in this preferred embodiment can be literally described as "0103+01282011+12345". It is possible, however, to support different masks, per unit, depending upon what POS is in use by individual units. The GSM-WS uses the survey token as a passed service parameter to determine the actual unit, business-date (by using start of business day rules), and check number. The POS system, plus other cards and placards, etc., can request

that the customer to complete a survey at the merchant's website (e.g. www.somemerchantwebsite.com/surveys). The target website will then prompt the customer to enter the survey token, or similar. It is also possible, when the customer is known to the POS, such as via a customer loyalty program, the POS (or related CRM) may generate a direct email with an embedded link requesting the loyalty program member to complete a survey.

[00103] Many POS systems are not able to universally provide some form of printed token that will allows the DCH to retrieve check data in order to complete a survey. If a POS is not able to generate a survey token, the customer check is still likely to contain the three criteria (unit, check-date and check number) needed to locate the requisite data. The GSM web-service provides support for both survey-token and/or manual entry of unit, date and check as they appear on most printed customer checks.

[00104] *Data Structure*

[00105] In a preferred embodiment, surveys are template based thereby allowing a merchant to deliver more than one survey type at a time to its customers. The following represents an illustrative template data structure:

- **Survey Header** – a collection of settings that describes a particular survey that can be deployed to one or more restaurants using smart groups, and with start-on-date viewing for changing surveys;
- **Survey Master Questions** – permanent key based list of questions that can be re-used in different surveys, having durable research value independent of differing survey templates;
- **Survey Questions** – taken from the Survey Master Question as a permanent key instance, a collection of these questions are joined to the Survey Header;

- **Respondent Header** – the response header is generated by the customer respondent and contains the information about the survey response itself; a survey is likely to have many responses, but there should only be one response per unit/customer/check instance;
- **Respondent Details** – detail rows of the Response Header containing customer response for survey questions, item surveys and comments;
- **Special Offers Master** – a table of special offer descriptions that might be offered as inducements for survey completion.

[00106] The system can select from the list of surveys a complete survey based upon check content and/or context around the check. For example, the system generate a different survey if the customer is known (a loyal customer) vs. an anonymous customer, or the system can generate a survey based upon what time of day they interacted with the merchant, etc. This is addition to the fact that individual questions within the chosen and generated survey can be context controlled.

[00107] An illustrative Survey Header could consist of the following columns *(bold shows default settings)*:

- Survey Description
- Active (Hide) {**Active**, Inacuve}
- Active Date
- CkDetails Scope Limit {can be null, or single selection of item smart group }
- Rate CkDetail Quality {**Checked**, Unchecked}
- Rate CkDetail Value {**Checked**, Unchecked}
- CkDetails Exist Action {**Details and Questions**, Details Only}
- CkDetails Missing Action {**Questions Only**, No Survey}

- Allow Customer Edit Hrs (0 – 999, default **0.5** Hrs)
- Special Offer (can be null or select from Special Offer Globally Unique Identifier (GUID)/list)
- Require Customer Authentication {Checked, **Unchecked**}
- >->>Survey Header Smart Groups
- >->>Survey Questions (described below)

[00108] When a survey is created by the system it should default to being hidden – so that at first it cannot be seen. The hidden column should be designated as 'Active' and 'In-active' for this purpose. An active survey template is by default active for all stores with optimistic and/or assigned smart group associations, according to the greatest active date. Only one survey can be active per customer per store at a time – however if an active survey can't be found for a store a return message to the WS caller must be provided.

[00109] The system does allow a collection of surveys to be available to the survey taker and the selection logic is applied to the collection so that only one survey is generated. The selection can have to do with venue (where the customer interacted with the merchant), or the check content (what they did, or did not purchase), or the size of the transaction, etc. It is generating different surveys to a repeat survey taker that keeps the customer more interested in participating by allowing variety in the survey itself.

[00110] The Active Date should default to the current date and should not be null. When the **Rate CkDetail Quality** is set to true the Survey Result table is populated for all sold items with the row flagged to measure the quality of the item. Likewise when the **Rate CkDetail Value** is set to true then the survey result table is populated with Detail Value types per items sold. The **CkDetails Exist Action** and **CkDetails Missing Action** work together to configure how the

GSM web-service will respond in the event that check details are found, or not found. If details do exist then the merchant has the option to only survey the check items sold, based upon the configurable options, or they may want to survey the details and appended general survey questions.

[00111] If check details do not exist (e.g. there is a network problem or the POS data has not yet been received by the DCH) the **Ck Details Missing Action** allows the system to deliver the general survey questions, or to reject the survey and include a rejection statement such as "The check you entered is not yet available in the survey system – please check back tomorrow." The **Allow Customer Edit Hrs** determines the amount of time a customer could come back and change their survey. If set this value is set to zero, then once the web-site sends the survey result a subsequent request for this same survey token would result in an error message: "This survey was previously completed; no survey is available." The **Special Offer**, when not-null, will hold a GUID linking to the details of the special offer and this information will be available to the web-site according to the Special Offer instructions (see Special Offer Processing). Setting the **Require Customer Authentication** flag requires that a customer authenticate (see Customer Authentication) to submit the survey and/or to receive the special offer benefit if so directed by the setup.

[00112] *Survey Master Questions*

[00113] In the preferred embodiment, the Survey Master Questions include the following illustrative columns, although other answer types are contemplated, (defaulted column values showing in bold):

- Survey Question (vchar)
- Required {Checked, **Unchecked**}

- Answer Type {5-Star, Single Select, Multi-Select}
- Answer List (vchar – can be null for 5-Star)
- Hide {Checked, **Unchecked}**

[00114] The master list of permanent questions is contained in this list. If a question goes out of favor it can be hidden, but it still may be referenced by an older survey. Hiding a question only makes it so that it cannot be looked up in the survey form or in a report parameter. The **Survey Question** should be able to hold a significant paragraph in the order of 400 characters minimum. If a response is **'Required'** the flag indicating such should be set to true; however it is up to the merchant web-site to manage this flag – the GSM web service module generates the flag but does not enforce it.

[00115] The system supports, at least, the following **Answer Types:** 5-Star where the web-site will allow an integer recording "1" through "5" as the result (similar to Amazon.com book reviews). Anything other but 1, 2, 3, 4, or 5 will not be stored by the DCH for this type; Single Select will allow the customer to select one answer from a multiple choice list; Multi-Select will allow the customer to select multiple choices from a multiple choice list. The **Answer List** is also a large storage vchar column that will hold a pipe delimited list of answers that will build the multiple choice list of answers to the question; this column can be null if the Answer Type equals '5-Star'.

[00116] *Response Header*

[00117] The Response Header includes the following columns (DCH generated column values showing in bold):

- Survey Master GUID
- Response Instance GUID

- Merchant GUID (can be null)
- UnitID
- Check Number (can be null)
- Check DateTime (can be null)
- Server/Cashier (can be null)
- Table/Station (can be null)
- Check Duration(can be null)
- Special Offer Grant (can be null)
- Request Manager Contact {checked, unchecked, **null**}
- Wrong Check {checked, unchecked, **null**}

[00118] The Result Header table will be generated by a GSM service. The generation of the survey contains the **Survey Master GUID**, and the **Response Instance GUID,** the instance representing a single survey instance of the master and the join for Response Details. If the merchant has authenticated then the **Merchant GUID** would be stored, else we store a null. **UnitID, Check Number, CheckDateTime, Server/Cashier, Table/Station, and Check Duration** are all columns populated from the original survey token and only if the check data is found at the time of survey. The **Special Offer Grant** is assigned if an offer exists with the survey and the customer qualities (for example both in terms of completed survey and number of prior offers extended). **Request Manager Contact** is the only web-client-side editable column in the Result Header: this option can be set to Checked/Unchecked or left as NULL. The **Wrong Check** state can be Customers' Web Site Designer (CWSD) utilized allowing the customer to declare that the check presented by our service was not identified as the correct customer check.

[00119] *Response Details*

[00120] **The Response Details** include following columns (DCH generated column values showing in bold):

- Survey Instance GUID
- Type {Item Quality, Item Value, Question}
- Question/Item GUID
- Answer (vchar)
- Comment (vchar)

[00121] The Response Details table is generated by the GSM service (discussed below). The generation of the survey contains **Survey Instance GUID**, this key joining data to the Response Header. The **Type** column holds the row-type of generated survey-result rows. A row type of *Item Quality* is generated from check details and only when the Rate Detail Quality flag of the survey is set to 'checked' (or true); this is also the case with *Item Value* and its corresponding flag named Rate Detail Value. Both the Item Quality and Item Value are automatically generated as '5-Star' survey rows. A row-type of Question indicates that the row is an answer to a survey question and the answer is in accordance with the Master Question option for answering the question. The **Answer** column must be large enough to store the multiple or single choice selections of the survey and will store the character value of '1', '2', '3', '4' or '5' for 5-Star values; null or empty Answer values will be considered to be invalid or were ignored by the customer. The **Comment** column is an optional value that can be populated by the web-site for each generated survey result row.

[00122] *Special Offers Master*

[00123] **The Special Offers Master** includes the following columns (defaulted states shown in bold):

- Special Offer Name (unique)
- Special Offer Details (vchar – 1,000)
- Special Offer Restrictions (vchar = 1,000)
- Limit Mode Per Guest {**None**, Per Month, Per Week, Per Day, Total}
- Limit Count {**0**, zero unlimited; 1 – 9999}

[00124] The Special Offers Master table holds a list of offers, plus details of that offer and control settings that the GSM uses to limit excessive repeat customer redemptions on an offer.

[00125] *Smart Client Tasking*

[00126] The system provides, as a part of the smart client tasking function, an administrative task named [Guest Survey Setup]. This task is organized in sub-tabs of "Survey Master Questions", "Special Offers", and "Survey Templates". All of the setup work for creating a new survey, creating and maintaining survey questions and offers, and the collection of this information known as a survey template. The form is preferably presented as a wizard with the option to show/hide the individual sub-tabs. Full wizard-tools can be provided for all row-elements (including child rows) for copy/paste to enable highly efficient setup of customer surveys.

[00127] The [Store Master] includes a column named [POS Unit survey token]. This column is populated with the existing unit number on conversion and upon a new row insert. Subsequent maintenance of this column is done by the DCH administrator. The POS Unit survey token is used to translate the unit portion of the survey token to retrieve the actual DCH UnitID used for subsequent web-service calls.

[00128] The Store Master row is where attributes about the selling store are stored. The connection to the POS Unit survey token is that the system provides mapping between the POS data (using the token or otherwise) from the merchant site to our store row.

[00129] *Web-Services Tasking*

[00130] The system preferably includes a new service locator URL for the Customer Survey Module (GSM) according to a predefined URL convention. An illustrative convention could be www.rmdatacentral.com/web/webservices/gsm and a service login. The GSM includes multiple services required for implementing the inventive method on the system. Services include:

- [GetGSMUnit] – identifies the DCH unit from customer check information;
- [GSM Customer Authentication] – optional feature to allow a returning customer to authenticate;
- [GSM Create/Edit Customer] – optional feature allows customer to create/edit their information;
- [GenerateSurvey] – generates the survey data;
- [EditSurvey] – allows the edited survey data to be stored in the DCH; and
- [GetSurveyState] – allows the survey to be validated as complete and with limited support for generating coupon benefits on a completed survey.

[00131] A [GetGSMUnit] service allows the merchant's web site designers to pass some or all of the following data for the purpose of locating the correct DCH unit, business date and check. For example the website may already have a store locator and this locator might be used instead of a survey token (if the POS is not able to produce the token) and in this case the locator would pass to the DCH the necessary columns to start the survey process. The following are examples of the columns that could be passed to the GetMSMUnit service:

- Survey Token
- External Unit Number
- External Unit Description
- External Unit Address
- External Unit City
- External Unit State
- External Unit Zip
- External Check Number
- External Check DateTime

[00132] Although variations are possible, the sequence precedence for this service of the preferred embodiment is important. The service must first ascertain if it can locate an actual DCH unit, and if not, the service generates a unit locator error. If a unit is found the service second will look for a valid Survey Template, and if none found a Survey locator error is generated. If a survey is found the service will third convert the check to a business date (for after midnight check DateTimes) and fourth attempt to locate the check. If a check is found, or not found, the resulting survey or error message response is determined by settings in the Survey Header. The following are examples of service response columns:

- DC Unit ID
- Survey Description
- Master Survey GUID
- Details Exist Mode
- Details Missing Mode
- Require Customer Authentication

- Special Offer GUID
- Special Offer Name
- Special Offer Details
- Special Offer Restrictions
- DC Check Number
- DC Business Date
- Service Error Message

[00133] The [GSM Customer Authentication] service allows a customer to either create or authenticate using an extant reference. The keys to customer authentication are [Last Name] and ([Phone] or [Email]). There is no secure data contained within this authentication – the purpose of authentication is to identify a regular customer and to have some mechanism for the manager/software to generate replies to surveys. The service will allow these values to be passed.

- DCH Unit ID (required)
- Customer Last Name
- Customer Phone Number
- Customer Email Address

[00134] The return values for authentication indicate that the customer was located; a null return indicates the customer information does not exist for this store. We won't know if the CWSD has their own customer tracking so this feature will be used to coordinate our customer table with web-site customers. The DC customer table only contains Customer Contact (for contact name) so the service will have to perform an 'IndexOf()' determination on last name and

then find either an email and/or phone number correlation. The result set for GSM Customer Authentication is:

- Contact Name
- Contact City
- Contact State
- Contact Zip
- Customer GUID

[00135] The [GSM Create/Edit Customer] allows the merchant's web page to react to a failed customer authentication or to handle a new authentication or allow a customer to edit an existing authentication. Service-confirmation returns the Customer GUID for successful insertion or an edit success or fail error message.

[00136] Examples of service options include:

- Customer GUID (if null then service assumes create, else it assumed edit)
- Master Customer GUID (can be null)
- Customer Salutation
- **Customer First Name**
- Customer MI
- **Customer Last Name**
- Customer Suffix
- Note: We concatenate SalFN+MI+LN+Sfx into our [Cusomer.Contact Name]
- **Customer Address1**
- Customer Address2
- **Customer City**

- **Customer State**
- **Customer Zip**
- Customer Cell (one of Cell/Phone/Email required to insert new customer row)
- Customer Phone (one of Cell/Phone/Email required to insert new customer row)
- Customer Email (one of Cell/Phone/Email required to insert new customer row)

[00137] The [GenerateSurvey] service generates the actual survey response rows or may generate an error message according to survey setup requirements. Example service options include:

- UnitID (required)
- MasterSurveyGUID (required)
- Check Number (optional)
- CheckDateTime (optional)
- CustomerGUID (optional)
- *Return:* Survey Instance GUID or NULL if not possible
- *Return:* Service Error Message

[00138] The generated survey must follow all of the rules of survey header (mastersurveyGUID). For check-details the CkDetail Scope Limit is used to include only those items belonging to the limiting smart group. If this group is not established, then all sold items are included in the group. The check details are consolidated using the DCH Item description, so that if more than one "7 oz. Sirloin Steak" was sold, only one instance would appear in the survey, but the quantity of sales would be part of the result description, such as "(2) – 7 oz Sirloin Steak". These survey descriptions would be doubled if the customer rates both the quality and value of check details.

[00139] A call to the [EditSurvey] service will return all of the rows generated by the service provided that the GenerateSurvey did not result in an error. This service will return row sets, but the service is initiated on the following:

- Survey Instance GUID (required)

[00140] The service returns the following row(s) columns according to the generated survey. fields that can be edited and re-submitted are indicated in **bold:**

- SurveyRowGUID
- RowType {Item Value, Item Quality, Question}
- RatingType {5-Star,Single-Select,Multi-Select}
- Item/QuestionText
- AnswerOptions (1,2,3,4,5 for 5-Star)
- ResponseRequired
- **SurveyResponse**
- **SurveyComment**

[00141] The cycle plan for this EditSurvey is that the CWSD passes the only the SurveyInstanceGUID as the initial pass to fill the return dataset with the survey rows. Our instructions indicate that the CWSD must build the survey presentation, including managing the multi-select and single-select answers as well as a 5-Start rating system and that the customer responses are stored in the SurveyResponse row column, and if the CWSD so enables, a corresponding comment. The CWSD, when sending the completed survey is required to only send the SurveyInstanceGUID, SurveyRowGUID, and the SurveyResponse (and optionally the SurveyComment). DC will save the survey but it is up to the CWSD to maintain, at the client (browser) things like required answers.

[00142] The [GetSurveyState] service requires only a passed parameter of SurveyInstanceGUID. The dataset returned is.

- SurveyState {Partial, Complete}
- SpecialOfferGUID
- SpecialOfferName
- SpecialOfferDetails
- SpecialOfferTerms
- ErrorMessage

[00143] This last service step provides a confirmation (or lack thereof) to the CWSD so that a coupon can be rendered by the CWSD, complete with offer name, details, terms and the GUID for coupon tracking. If the special offer exceeded a limit the error message would display the limit. If a customer does not want to use special offer incentives these columns would return nulls.

[00144] *IP Blocking*

[00145] Another aspect of the inventive system includes the ability to present an administrator with a list of IP address as 'select-distinct' from all IP's that have ever generated a website contact or survey. A second column [Block] should allow the admin to set a block on the IP address.

[00146] The web-services for generating a survey or web-site contact must check the blocked IP list, and if the IP is found to be blocked the service should return a message that the IP is blocked. The Customer Survey and Web Site contact apps must simply report that "The underlying service is not available at this time." and no further processing should be allowed for that IP.

[00147] *Website Contact*

[00148] The website contact feature is a special subset of the current configurable survey. In general the feature allows merchants to bury a small java-tag into their website to call a dedicated Website Contact form. The form works like the current survey in that the first page will allow the customer to select a unit, but instead of selecting a date and check, the date is always defaulted to the current server date-time, and no check information is required. The next page asks the customer to identify themselves, but in this case 'I prefer to remain anonymous' is not allowed. The next page generates the two questions and one comment in a single page. The submit page provides the customer a last point before submitting the comment, and the Thank you page provides a simple thank you statement.

[00149] *Customer Survey Review*

[00150] Reporting will be the primary method for users to review surveys but the DCH client also provides a platform for reviewing surveys as well as the preferred platform for DCH administrators to manage junk surveys. Just as forum administrators can manage the occasional problematic forum entry, the DCH administrator for surveys is able to invalidate a toxic survey.

[00151] The Customer Survey Review feature is preferably presented as a wizard for Admin/MU and Unit access. The start page of the wizard could provide the following filters:

- Unit (required)
- Templates (multi-select of possible templates, default to 'All')
- Questions (multi-select to master questions, default to 'All')
- Minimum and Maximum scores (default to 'All', if present filters only those questions that have an associated answer score)
- From and through dates (filters dining dates, default to current-7 through current)

[00152] Questions and scores are filter tests for survey details while Unit, Template, and Dates are survey header filters. There is preferably a hidden filter for MU and U users that will filter out 'Junk' surveys allowing only administrators to see surveys/questions marked as junk.

[00153] Clicking next opens a combination of grid (top panel) and grid (lower panel). The top panel should display the survey headers and the bottom the survey questions, answers and scoring (many to one). The data should appear as read-only.

[00154] The administrator is able to see all surveys and questions, including headers and questions marked as junk. The survey header and survey questions should have an 'YN (checkbox)' column named junk. Because the data is to be shown as read-only, two TOOLBAR actions should be available to the administrator:

- Mark Survey as Junk
- Mark Question/Response as Junk

[00155] These two should show as a toggle, so that a survey or question accidentally therefore marked can be un-marked. Also for the administrator there should be a TOOLBAR option to 'Block Survey IP'. Clicking this feature would write the IP address of this survey into the blocked IP list.

[00156] The various embodiments of the invention may be implemented as a sequence of computer implemented steps or program modules running on a computing system and/or as interconnected machine logic circuits or circuit modules within the computing system. The implementation is a matter of choice dependent on the performance requirements of the computing system implementing the invention. In light of this disclosure, it will be recognized by one skilled in the art that the functions and operation of the various embodiments disclosed may be implemented in software, in firmware, in special purpose digital logic, or any

combination thereof without deviating from the spirit and scope of the present invention as recited within the claims attached hereto.

[00157] The above specification, examples and data provide a complete description of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

What is claimed is:

1. A system for implementing transaction-specific surveys comprising

(a) a point-of-sale interface used in conducting a commercial transaction between a consumer and a vendor, the point-of-sale interface being configured to record transaction data relating to the commercial transaction, wherein the transaction data comprises at least one product/service identifier and a survey token;

(b) a survey server computing device configured to receive and store the transaction data generated by the point-of-sale interface, wherein:

(i) the survey server computing device comprises (A) a survey database having master survey question data, (B) a vendor database storing a plurality of product/service identifiers identifying products/services available for purchase through the vendor, and (C) a survey header having stored vendor preference data corresponding to each product/server identifier, wherein the vendor preference data includes a CkDetail flag having a first value when the product/service is selected to be the subject of at least one Product Survey Question and having a second value when the product/service is not selected to be the subject of at least one Product Survey Question;

(ii) the survey server computing device is configured to perform the operations comprising (A) receiving a survey token, (B) retrieving the transaction data having the stored survey token corresponding to the received survey token, (C) generating, based on the master survey question data, at least one Product Survey Question for each product/service identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value, and (D)

generating a Survey Module comprising software code for displaying the at least one Product Survey Question;

(c) a vendor survey interface configured to perform the operations comprising: (i) transmitting the survey token to the survey server computing device, (ii) receiving from the survey server computing device the Survey Module, (iii) generating a graphical user interface on a display screen, (iv) running the Survey Module to display the at least one Product Survey Question as an integrated component within the graphical user interface; (v) generating a Respondent Header based on user-generated inputs in response to the at least one Product Survey Question; and (vi) transmitting the Respondent Header to the survey server computing device.

2. The system of claim 1, wherein: (a) the vendor survey interface is implemented as a web server computing device; (b) the graphical user interface is a host vendor webpage; (c) and the Survey Module is a webpage frame configured for display as an integrated component of the host vendor webpage.

3. The system of claim 2, wherein the point-of-sale interface is implemented as a point-of-sale computing device.

4. The system of claim 1, wherein vendor survey interface is implemented as a software application running on a mobile computing device, and the survey token is input by the consumer to the vendor survey interface.

5. The system of claim 1, wherein the point-of-sale interface and the vendor survey interface are both implemented as a software application running on a mobile computing device.

6 The system of claim 1, wherein:

(a) the transaction data further comprises at least one vendor facility identifier identifying a vendor facility where the commercial transaction occurred;

(b) the vendor database further comprises a plurality of vendor facility identifiers identifying one or more vendor facilities used to conduct commercial transactions;

(c) the survey header further comprises stored vendor preference data corresponding to each vendor facility identifier, wherein the vendor preference data includes a CkDetail flag having a first value when the vendor facility is selected to be the subject of one or more Facility Survey Questions and having a second value when the vendor facility is not selected to be the subject of one or more Facility Survey Questions; and wherein

(d)) the survey server computing device is configured to perform the operations comprising (E) generating, based on the master survey question data, at least one Facility Survey Question for each vendor facility identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value, and (F) incorporating within the Survey Module software code for displaying the at least one Facility Survey Question.

7. The system of claim 6, wherein:

(a) the transaction data further comprises at least one internal facility location identifier identifying an internal location within a vendor facility.

(b) the vendor database further comprises a plurality of internal facility location identifiers identifying one or more internal locations within a vendor facility;

(c) the survey header further comprises stored vendor preference data corresponding to each internal facility location identifier, wherein the vendor preference data includes a CkDetail flag having a first value when the internal location is selected to be the subject of one or more Internal Facility Survey Questions and having a second value when the internal location is not selected to be the subject of one or more Internal Facility Survey Questions; and wherein

(d) the survey server computing device is configured to perform the operations comprising (G) generating, based on the master survey question data, at least one Internal Facility Survey Question for the each internal facility location identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value, and (H) incorporating within the Survey Module software code for displaying the at least one Internal Facility Survey Question.

8. The system of claim 7, wherein the internal facility location identifiers are table numbers.

9. The system of claim 6, wherein

(a) the transaction data further comprises at least one vendor personnel identifier identifying vendor personnel;

(b) the vendor database further comprises a plurality of vendor personnel identifiers identifying one or more vendor personnel;

(c) the survey header further comprises stored vendor preference data corresponding to each vendor personnel identifier, wherein the vendor preference data includes a CkDetail flag

having a first value when the vendor personnel is selected to be the subject of one or more Personnel Survey Questions and having a second value when the vendor personnel is not selected to be the subject of one or more Personnel Survey Questions, and wherein

(d) the survey server computing device is configured to perform the operations comprising (G) generating, based on the master survey question data, at least one Personnel Survey Question for each vendor personnel identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value, and (H) incorporating within the Survey Module software code for displaying the at least one Personnel Survey Question.

10 The system of claim 1, wherein: (a) the master survey question data includes at least one General Survey Question that is not specific to the transaction data; and (b) the survey server computing device is further configured to perform the operation of incorporating within the Survey Module software code for displaying the at least one General Survey Question.

11 The system of claim 1, wherein: (a) the master survey question data comprises at least one template survey question; and (b) the survey server computing device is further configured to perform the operation of generating the at least one Product Survey Question based on the template survey question and the product/service identifier.

12 The system of claim 1, wherein: (a) the master survey question data comprises at least one product specific survey question corresponding to one or more product/service identifiers; and (b) the survey server computing device is further configured to perform the operation of

generating the at least one Product Survey Question based on the product specific survey question and the one or more product/service identifiers.

13 The system of claim 9, wherein the vendor preference data further comprises a Max Question value setting a maximum number of survey questions included within the Survey Module.

14 A computer-implemented method for providing transaction-specific surveys comprising the operations of:

(a) providing a survey server configured to receive and store transaction data generated by point-of-sale interface relating to a commercial transaction between a consumer and a vendor, wherein

(i) the transaction data comprises at least one product/service identifier and a survey token, and

(ii) the survey server comprises (A) a survey database having master survey question data, (B) a vendor database storing a plurality of product/service identifiers identifying products/services available for purchase through the vendor, and (C) a survey header having stored vendor preference data corresponding to each product/server identifier, wherein the vendor preference data includes a ClkDetail flag having a first value when the product/service is selected to be the subject of at least one Product Survey Question and having a second value when the product/service is not selected to be the subject of at least one Product Survey Question;

(b) receiving by the survey server, a survey token;

(c) retrieving by survey server, the transaction data having the stored survey token corresponding to the received survey token;

(d) generating by survey server, based on the master survey question data, at least one Product Survey Question for each product/service identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value;

(e) generating by the survey server, a Survey Module comprising software code for displaying the at least one Product Survey Question as an integrated component within a graphical user interface;

(f) transmitting by the survey server, the Survey Module to a vendor survey interface; and

(g) receiving by the survey server, a Respondent Header generated based on user-generated inputs in response to the at least one Product Survey Question.

15 The method of claim 14, wherein: (a) the vendor survey interface is implemented as a web server computing device; (b) the graphical user interface is a host vendor webpage; (c) and the Survey Module is a webpage frame configured for display as an integrated component of the host vendor webpage.

16 The method of claim 14, wherein:

(a) the transaction data further comprises at least one vendor facility identifier identifying a vendor facility where the commercial transaction occurred;

(b) the vendor database further comprises a plurality of vendor facility identifiers identifying one or more vendor facilities used to conduct commercial transactions;

(c) the survey header further comprises stored vendor preference data corresponding to each vendor facility identifier, wherein the vendor preference data includes a CkDetail flag having a first value when the vendor facility is selected to be the subject of one or more Facility Survey Questions and having a second value when the vendor facility is not selected to be the subject of one or more Facility Survey Questions; and wherein

(d) the survey server is configured to perform the operations comprising (i) generating, based on the master survey question data, at least one Facility Survey Question for each vendor facility identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value, and (ii) incorporating within the Survey Module software code for displaying the at least one Facility Survey Question.

17. The method of claim 14, wherein:

(a) the transaction data further comprises at least one vendor personnel identifier identifying vendor personnel;

(b) the vendor database further comprises a plurality of vendor personnel identifiers identifying one or more vendor personnel;

(c) the survey header further comprises stored vendor preference data corresponding to each vendor personnel identifier, wherein the vendor preference data includes a CkDetail flag having a first value when the vendor personnel is selected to be the subject of one or more Personnel Survey Questions and having a second value when the vendor personnel is not selected to be the subject of one or more Personnel Survey Questions; and wherein

(d) the survey server is configured to perform the operations comprising (i) generating, based on the master survey question data, at least one Personnel Survey Question for

each vendor personnel identifier in the transaction data having a corresponding vendor preference data CkDetail flag set to the first value, and (ii) incorporating within the Survey Module software code for displaying the at least one Personnel Survey Question.

18. The system of claim 14, wherein: (a) the master survey question data includes at least one General Survey Question that is not specific to the transaction data; and (b) the survey servet is further configured to perform the operation of incorporating within the Survey Module software code for displaying the at least one General Survey Question.

19. The system of claim 14, wherein: (a) the master survey question data comprises at least one template survey question; and (b) the survey server is further configured to perform the operation of generating the at least one Product Survey Question based on the template survey question and the product/service identifier.

ABSTRACT

Provided are a method and system for automatically generating context-based survey questions predicated on the customers' actual purchase experience with the merchant, thus eliminating for the customer the need to respond to obvious, redundant, and even irrelevant questions, and providing to the merchant customer feedback directly bound to the actual purchase event and correlating data. Purchase information is stored at the time of purchase and the customer is given an identifier for the purchase. Then, at the customer's convenience, either at the point of sale or through a networked computer, the customer can provide responses to questions that are selectively and automatically generated based on the items purchased, or other definable attributes associated with the sale, and based upon configurable preferences of the merchant. Survey questions are displayed and feedback responses are stored, analyzed and associated with purchase information in real time.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12875-086356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Steven	A.	Roberts	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Tampa	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	4010 W. Boy Scout Blvd.		
Address 2	Suite 300		
City	Tampa	State/Province	FL
Postal Code	33607	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Drew		Peloubet	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Tampa	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	4010 W. Boy Scout Blvd.		
Address 2	Suite 300		
City	Tampa	State/Province	FL
Postal Code	33607	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12875-088356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	57838		
Email Address	jfabian@shumaker.com	Add Email	Remove Email
Email Address	paldocketing@slk-law.com	Add Email	Remove Email

Application Information:

Title of the Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM		
Attorney Docket Number	A12875-088356	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	9	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative Information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	57838		

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12875-088356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	14997434	2016-01-15
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
14997434	Claims benefit of provisional	62104043	2015-01-15

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[1] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[1]	Filing Date (YYYY-MM-DD)	Access Code[1] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12875-088356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12875-088356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. [•]

Organization Name	AFTERWORDS, INC.		
Mailing Address Information For Applicant:			
Address 1	4010 W. Boy Scout Blvd.		
Address 2	Suite 300		
City	Tampa	**State/Province**	FL
Country	US	Postal Code	33607
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12675-088356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Jeffrey B. Fabian/			Date (YYYY-MM-DD)	2019-02-19
First Name	Jeffrey B.	Last Name	Fabian	Registration Number	70164

Additional Signature may be generated within this form by selecting the Add button.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A12875-088356
	Application Number	
Title of Invention	TRANSACTION-SPECIFIC CUSTOMER SURVEY SYSTEM	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Servires, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.