

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.

Petitioner,

v.

KONINKLIJKE KPN N.V.,

Patent Owner.

IPR2023-00524

Patent No. 9,372,098

EXPERT DECLARATION OF RADOSTIN PACHAMANOV, Ph.D.

EXHIBIT LIST

Exhibit No.	Description
2001	Expert Declaration of Radostin Pachamanov, PhD.
2002	<i>Curriculum Vitae</i> of Radostin Pachamanov, PhD.
2003	3GPP TR 21.905 v.8.6.0
2004	ITU-R V.662-3
2005	Excerpts from Webster's New World College Dictionary (4 th Ed. 1999)
2006	Excerpts from Webster's New World College Dictionary (4 th Ed. 1999)
2007	Excerpts from The Oxford American Desk Dictionary (1998)
2008	Excerpts from The American Heritage Dictionary (2 nd College Ed. 1982)
2009	U.S. Patent No. 9,277,384
2010	U.S. Patent No. 10,419,899

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I. INTRODUCTION

1. I have been retained as a technical expert by Koninklijke KPN N.V. (“Patent Owner”) and asked to provide my objective and unbiased opinions concerning U.S. Patent No. 9,372,098 (“the ’098 Patent”). Specifically, I have been asked to provide my opinions on the patentability of the ’098 Patent in view of certain prior art references, the state of the art at the time of the claimed invention, and the knowledge of a person of ordinary skill in the art at the time of the claimed inventions. I have also been asked to provide my opinions on the arguments set forth in a Petition for *Inter Partes* Review of the ’098 Patent in IPR2023-00524, which was filed by Petitioner Ericsson Inc. (“Petitioner”).

II. BACKGROUND AND QUALIFICATIONS

2. In forming the opinions expressed in this Declaration, I have considered and relied upon my education, background, and experience. In addition, I have also reviewed and relied upon additional materials in preparation of this Declaration, as described below.

3. My experience, qualifications and education are detailed in my curriculum vitae (“CV”), a copy of which is attached as Exhibit 2002. My CV also lists publications on which I am a named author and identifies parties on behalf of whom I have previously provided expert testimony.

4. I graduated with a BSc in Electrical Engineering with a focus in Telecommunications Networks from the Technical University of Sofia (Bulgaria) in 2002. In 2008, I received a Ph.D. in Telecommunications Engineering from the same university. My doctoral studies focused on telecommunications traffic engineering, Quality of Service (QoS) assurance and traffic management in broadband cellular mobile networks.

5. During my studies I worked on a number of research projects funded by the government of Republic of Bulgaria, related to network planning and traffic management in fixed broadband and cellular networks. I also worked as a software developer for systems that implemented data transmission over cellular networks for the purposes of remote monitoring and control which helped me acquire firsthand experience with machine-to-machine communications performed over public cellular networks. I was also involved as a consultant in the “E-Street” initiative, part of the European Union’s “Intelligent Energy Europe” program, and participated in a research group aimed at developing recommendations for EU standards and legislation for managed outdoor networked lighting systems where my contribution was focused on the use of public cellular networks and other wireless standards for implementing intelligent remote monitoring and control.

6. From January 2008 to July 2013, I was employed by Ericsson in Sofia, Bulgaria. While at Ericsson, I worked as a Solution Architect responsible for the complete Ericsson portfolio of products and solutions in its Billing, Fulfillment, Assurance; TV & Media Management; and System Integration solution areas. As a Solution Architect I was involved in the offering, design and implementation of client specific solutions which required an extensive knowledge of the architecture, components, and operations of fixed and mobile telecommunications networks. In 2009 I was appointed as a member of the “Revenue Assurance” team at Customer Unit North Balkans and was responsible for identifying and developing opportunities related to assessing data quality and improving the operation of telecommunications networks (fixed and mobile) for identifying potential revenue leakages. I designed and worked on the implementation of various technical solutions such as, e.g., billing data consolidation of call data records originating from the network elements from both the fixed and mobile networks of an incumbent telecom operator, and an end-to-end DVB-S2 Satellite TV systems for the same carrier. I also acted as a technical lead of a large system integration project financed by the Ministry of Interior in Bulgaria for a border surveillance system providing security for the external European Union border between Bulgaria and Turkey. As part of the surveillance system, we designed and built a dedicated microwave

transport communication network and cellular coverage allowing connection, data transmission and data collection between and from the various system components such as sensors, radars, surveillance cameras, etc. and the distributed control centers. Between 2011 and 2013, I also served as an Account Manager and was responsible for the complete Ericsson portfolio in Bulgaria. I was commercially responsible and managed a team that designed an LTE radio access and core networks for a “greenfield” telecom carrier.

7. In October 2013, I moved to Elysium Digital, a technical litigation consulting company located in Boston, Massachusetts, specializing in providing computer science and electrical engineering expertise in legal disputes involving intellectual property, computer forensics, and other high-tech subject matters. Elysium Digital was acquired by Stroz Friedberg in 2015, and Stroz Friedberg was acquired by Aon, plc. in 2018. I currently serve as a Director at Aon’s Intellectual Property Solutions department.

8. Since joining Elysium Digital, I have worked on more than 50 technical matters related to telecommunications, television systems, data forensics, electronic devices, and computer networks. As part of my work, I have been involved in patent portfolios analysis and litigation cases that required an extensive study and reference to various telecommunications recommendations and standards.

9. Based on my work experience and education, I am very familiar with the structure and operation of cellular networks, including the standards governed by The 3rd Generation Partnership Project (“3GPP”). Based on that same experience and education, I consider myself an expert in the relevant field of the '098 Patent. I am familiar with how a person having ordinary skill in the art would have understood and used the terminology found in the '098 Patent as of the date of the '098 patent, which I have been asked to assume is October 28, 2008 for purposes of my Declaration.

10. I am being compensated for services provided in this matter at a rate of \$555.00 per hour for all time spent on it, and all of my travel expenses are being accounted for by Patent Owner. My compensation is not contingent on my opinions, on the outcome of any matter, or on any of the technical positions I explain in this declaration.

11. I have no financial interest in Patent Owner or the '098 Patent.

III. LEGAL STANDARDS

12. I am not an attorney. For purposes of this Declaration, I have been informed about certain aspects of the law that are relevant to my opinions, as set forth below.

A. Patentability

13. I understand that for an invention claimed in a patent to be valid and patentable, it must be, among other things, new and not obvious in light of what was known and came before it. That which was known or came before the invention claimed is generally referred to as “prior art.”

14. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to “anticipate” the claim. Second, the prior art can show that the claim was obvious to a person of ordinary skill in the field of the invention at the time the invention was made.

15. I understand that, for a patent claim to be “anticipated” by the prior art, each and every element or requirement of the claim must be found, expressly or inherently, in a single prior art reference.

16. It is my understanding that whether a claimed invention is obvious is a question of law, with underlying factual inquiries that are determined from the perspective of a person of ordinary skill in the art at the time of the claimed invention.

17. It is my understanding that a claimed invention is obvious if the differences between the claimed invention and the prior art are such that the claimed

invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art (a “POSITA”).

18. It is my understanding that obviousness requires consideration of the following underlying factual inquiries:

- determining the scope and content of the prior art
- ascertaining the differences between the claimed invention and the prior art;
- resolving the level of ordinary skill in the art; and
- evaluating objective evidence or “secondary considerations” of non-obviousness, such as commercial success, long-felt but unresolved needs, failure of others, industry praise, and unexpected results.

19. It is my understanding that a reference must be analogous art to the claimed invention in order to be properly considered for use in an obviousness inquiry. It is my understanding that a reference is analogous art to the claimed invention if:

- the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or
- the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed

invention).

20. It is my understanding that whether a reference is reasonably pertinent turns on how the problem faced by the inventor is reflected, either explicitly or implicitly, in the specification.

21. It is my understanding that the following are exemplary rationales that may support a conclusion of obviousness:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of known techniques to improve a similar method or product in the same way;
- Applying a known technique to a known method or product ready for improvement to yield predictable results;
- Obvious to try – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and

- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

22. In addition to the above, I understand that a person of ordinary skill in the art may resort to logic, judgment and common sense available to him or her at the time of the invention to find a claim feature obvious, even if the prior art relied on does not explicitly state or teach that feature. I understand that when common sense is relied on to find a feature obvious, the reasoning for that conclusion must be articulated with sufficient clarity.

23. I also understand that a patent claim is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. An obviousness determination requires finding both that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so. I understand that it is important to be careful not to allow hindsight reconstruction of references to produce the claimed invention, without any explanation as to how or why the references would be combined to produce the claimed invention.

24. Regarding “objective evidence” or “secondary considerations,” I understand that for such evidence to be relevant to the obviousness of a claim, there must be a causal relationship (called a “nexus”) between the claim and the evidence. I also understand that such objective evidence may include: commercial success of products covered by the patent claims; long-felt need for the invention; failed attempts by others to solve the problem addressed by the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making or use of the invention; and that the patentee proceeded contrary to the accepted wisdom of the prior art.

25. I understand that a person of ordinary skill is also a person of ordinary creativity. I further understand that the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take into account “ordinary innovation” that does no more than yield predictable results, which are inferences and creative steps that a person of ordinary skill in the art would be understood to employ.

26. I understand that sometimes it will be necessary to look to interrelated teachings of multiple patents and publications; the effects of demands known to the relevant field or present in the marketplace; and the background knowledge

possessed by a person having ordinary skill in the art. I understand that all these issues may be considered to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

B. Prior Art

27. I understand that for purposes of this proceeding, prior art includes patents and printed publications in or outside the United States before the effective filing date of the claimed invention. I also understand that prior art includes U.S. patents, published U.S. patent applications, and published international applications (pursuant to the Patent Cooperation Treaty) that themselves have an effective filing date before the effective filing date of the claimed invention, as long as they name another inventor.

28. I also understand that prior art may include any public disclosure, including any products in public use, on sale, or otherwise available to the public, before the effective filing date of the claimed invention. I understand that information that constitutes prior art generally must be information that was publicly disclosed before the effective filing date of the claimed invention. I understand that there may be exceptions to what is prior art but have been instructed that they are not relevant for purposes of my opinions here.

C. Inherency

29. I understand that if a prior art reference does not expressly set forth a particular claim element, the prior art may still disclose that element if it is “inherent” in its disclosure. To establish inherency, it is my understanding that evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference. It is my understanding that inherency may not be established by probabilities or possibilities. In other words, it is my understanding that the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.

30. I understand that under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform a claimed method, then the method will be considered to be anticipated by the prior art device. I also understand that when the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process.

D. Person of Ordinary Skill In The Art

31. I understand that “a person of ordinary skill in the art” or POSITA is a hypothetical person who is presumed to have known the relevant art at the time of the invention. I understand that the term “person having ordinary skill in the art” or

POSITA is sometimes used synonymously. Such a person would necessarily have the capability of understanding any scientific and engineering principles applicable to the pertinent art.

32. I understand that factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the following:

- a. the educational level of the inventor;
- b. the type of problems encountered in the art;
- c. prior art solutions to those problems;
- d. the rapidity with which innovations are made;
- e. the sophistication of the technology; and
- f. the educational level of active workers in the field.

33. I understand that a person of ordinary skill in the art is not a real person, but rather is a hypothetical individual having the qualities reflected by the factors above. This hypothetical person has knowledge of all prior art in the relevant field as if it were arranged on a workshop wall and takes from each reference what it would teach to a person of ordinary skill in the art.

34. I understand that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton. In many cases a person of ordinary skill will

be able to fit the teachings of multiple prior art references together like pieces of a puzzle.

35. I understand that a person of ordinary skill in the art can collaborate with one or more other persons of ordinary skill in the art for one or more aspects with which the other person may have superior expertise, experience, and/or knowledge.

E. Claim Construction

36. It is my understanding that claim construction, or the interpretation of the claims of a patent, is ultimately a question of law. I have been informed that claim terms are generally presumed to carry their ordinary and customary meaning. However, I understand that a patent applicant is his own lexicographer and is entitled to provide alternate definitions of words in common usage, but if the patent applicant uses a term that is in common usage without providing an alternate definition, then that term should generally be understood as having its common meaning.

37. I understand that a person of ordinary skill in the art is deemed to read a claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent specification and the “file history” of the patent developed during examination by the Patent Office.

38. I understand that the claims, the specification, and the file history are referred to as “intrinsic evidence,” and are to be read as a person of ordinary skill in the art at the time of the invention would have done at the time of the alleged invention.

39. In addition to the intrinsic evidence, I understand that the court or tribunal may also consider other relevant evidence, which is called “extrinsic evidence,” concerning relevant scientific principles, the meaning of technical terms, and the state of the art. Such evidence includes the testimony of expert witnesses. Although extrinsic evidence may be used to resolve ambiguities that may exist after reviewing the intrinsic evidence, I understand that extrinsic evidence cannot be used to contradict a claim construction that is clear from the intrinsic evidence.

40. I understand that some claims are independent, and that those independent claims are complete by themselves. Other claims refer to these independent claims, or other dependent claims, and are “dependent” on those claims. The dependent claims include all of the limitations of the claims on which they depend.

IV. BASES FOR OPINIONS

41. The opinions set forth in this Declaration are my own. In forming the opinions herein, I have considered the exhibits to the Petition for *Inter Partes Review*

filed against the '098 Patent, as well as the additional materials cited in this Declaration and my education, training, and experience.

42. My analysis of the materials relating to this matter is ongoing and I will continue to review any new material that is provided to me. This Declaration represents certain opinions that I have formed to date and the bases for those opinions. I reserve the right to revise, supplement, and/or amend my opinions based on new information presented to me and on my continuing analysis of the materials cited herein or later provided to me.

V. LEVEL OF ORDINARY SKILL IN THE ART

43. I have not been asked to provide an opinion on the level of ordinary skill in the art at the time of the invention. For purposes of this Declaration only, I have instead been asked by Patent Owner to apply the definition of a person having ordinary skill in the art (“POSITA”) proposed by Petitioner:

A person of ordinary skill in the art at the time of the alleged invention of the '098 Patent would have had a degree in electrical engineering or a similar discipline with at least three years of relevant industry or research experience, including designing or implementing cellular systems. EX1003, ¶ 41. A POSITA would also have familiarity with the wireless standards and protocols relating to data transmission and subscriber management. *Id.* This definition is approximate, and more education may substitute for industry experience or vice versa. *Id.*

Petition, 14. All references to a POSITA are made pursuant to that definition. However, my application of that definition is not a reflection of my agreement or disagreement with it. I reserve the right to provide my own opinion on the level of ordinary skill should there be further proceedings.

44. My experience and qualifications exceed that of a POSITA as described in Section II above. Specifically, I have a Bachelor's of Science in Telecommunications Networks and a Ph.D. in Telecommunications Engineering, including over a decade of experience with telecommunications networks and

cellular systems in particular. Unlike general electrical engineering studies, my degree and doctorate focused primarily on telecommunications technologies and networks, such as the standards established by IETF, ITU, IEEE and 3GPP.

VI. OPINIONS ON CLAIM CONSTRUCTION

45. I understand that claim terms are given their plain and ordinary meaning as understood by a POSITA. I have applied the plain and ordinary meaning of all claim terms at issue. To the extent I believe an explanation of the plain and ordinary meaning may be helpful, I have provided it where appropriate below.

VII. OPINIONS ON VALIDITY

A. Whether Krco’s “secondary data” is “non-signalling application data”

46. All independent claims require a signalling message that includes non-signalling application data. *See* Claims 1, 15, 17 (reciting a “wireless signalling message having inserted in it ***non-signalling*** application data”), Claim 21 (“encapsulating said ***non-signalling*** application data in one or more signalling messages”).

47. Petitioner alleges that Krco’s “secondary data” is “non-signalling application data” that is embedded in a Location Update Request/Routing Area

Update message (alleged “signalling message”) of the UE 10. Petition, 36. Petitioner is mistaken for the reasons below.

48. “Signalling” is a term of art that the Vocabulary for 3GPP Specifications (3GPP TR 21.905, v. 8.6.0, Release 8) accurately characterizes as “[t]he exchange of information specifically concerned with the establishment and control of connections, and with management, in a telecommunications network.” Ex. 2003, 25.¹ “Telecommunications network” broadly refers to a network of devices that communicate through electric or electronic means. *See* Ex. 2004, 11 (International Telecommunication Union Radiocommunications Sector defining as “[a]ll the means of providing telecommunication services between a number of locations where equipment provides access to these services.”)²; *see also* Ex. 2005,

¹ 3GPP TR 21.905, V. 8.6.0, Release 8 (Exhibit 2003) is a collection of terms, definitions and abbreviations used within the 3GPP project that facilitates the understanding of 3GPP technical documentation. Exhibit 2003 is a true and correct copy of 3GPP TR 21.905, V. 8.6.0 as published at: https://portal.etsi.org/webapp/workprogram/Report_WorkItem.asp?WKI_ID=29030. An expert in my field would reasonably rely on the facts or data set forth in this document in forming the opinions provided here. I’m not aware of any information or reason to doubt the accuracy or truth of the contents of this document.

² ITU-R V.662-3 (Exhibit 2004) is a technical recommendation which provides definitions of general telecommunications terms with reference to the International Electrotechnical Vocabulary (IEV). The specification serves to promote and ensure unification of terminology used across the International Telecommunication Union (ITU) sectors. Exhibit 2004 is a true and correct copy of ITU-R V.662-3 as published at: <https://www.itu.int/rec/R-REC-V.662-3-200005-W/en>. An expert in my field

9 (defining “telecommunication” as “communication by electronic or electric means, as through radio, telephone, telegraph, television or computers”); Ex. 2006, 7 (defining “telecommunication” as “communication over a distance by cable, telegraph, telephones, etc.”); Ex. 2007, 8 (defining “telecommunication” as “The science and technology of communication by electronic transmission of impulses, as by telegraphy, cable, telephony, radio, or television”).

49. A POSITA would therefore understand that “**non**-signalling data” is data that is **not** specifically concerned with the establishment or control of connections, and with management, in a telecommunications network. This is consistent with Petitioner’s assertion that data that “affects the connection between” two devices in a network is “considered ‘signalling data.’” Petition, 20-21.

50. A POSITA would understand that the secondary data of Krco is **not** “non-signalling” data because it **is** specifically concerned with the establishment, control and management of the connection between the second entity/network and the M2M service provider. More specifically, a POSITA would understand that the secondary data “about the properties” of the second entity/network (Ex. 1009, 4:44-47) is signalling data associated with the second entity/network, just like the data

would reasonably rely on the facts or data set forth in this document in forming the opinions provided here. I’m not aware of any information or reason to doubt the accuracy or truth of the contents of this document.

“about the properties of the UE” (Ex. 1009, 4:39-40) is signalling data associated with the UE.

51. Krco teaches that the UE 10 generates a first message 21 (e.g., Location Update Request) to inform the cellular network (e.g., third entity 13, 14) “about the location and properties of the UE,” including “availability information” that indicates to the network if the UE is present. Ex. 1009, 4:16-53.³ Data “about the location and properties of the UE 10” is signalling data because it is used by the network to establish, control and manage the connection of the UE 10 in the telecommunications network.

52. As an example, the Location Update Request/Routing Area Update message contains information on the location of the user terminal, which is used by the network to establish and manage a connection with the user terminal regardless of its current location (as long as it is in an area, served by the network). Ex. 1009, 5:10 (listing “location area identification” within information element of Location Update Request). A Location Update Request (in the circuit-switched domain) or the Routing Area Update message (in the packet-switched domain) belong to well-known standardized Mobility Management procedures in cellular networks for

³ Krco lists the various information elements (“IE”) that make up the signalling data of the Location Update Request and allow “a network to monitor the location and availability of UEs attached to the network.” *Id.* at 5:1-14.

establishing and managing connections. *See e.g.*, Ex. 1011, 256 (discussing Location Updating Request), 306 (discussing Routing Area Update Request)).

53. The Location Update Request/Routing Area Update message also contains information about the properties of the user terminal that is used by the network to establish and manage the user terminal's connection. For example, the identify of user terminal is included, which is used to authenticate and allow the user terminal to register with the network. Ex. 1009, 5:12 (listing "mobile identity" as one of the pieces of information in a Location Update Request information element), 5:30 (listing "P-TMSI (Mobile Identity)" as one of the pieces of information in a Routing Area Update Request). Other signalling information within these messages includes, but is not limited to, properties and capabilities of the UE and its location and availability. *See e.g.*, Ex. 1009, 5:29 (listing "TMSI status" as one of the pieces of information in a Routing Area Update Request message).

54. Information about the terminal's location, identity and availability is stored in the network registers and, e.g., in case of incoming traffic to a mobile user (e.g., an incoming call), those registers are queried to determine the user's current location. This enables, e.g., the network gateway to establish a communication session with the terminal and route the traffic through the relevant network elements responsible for serving the particular location area/routing area where the user

terminal is located. Therefore, a POSITA would understand that all of the information discussed above (e.g., status, availability, location, other mobile properties) is used to establish, manage, and control the connection of the user terminal within the network, and as such, is signalling data.

55. Krco takes this concept of the UE 10 providing signalling information to the cellular network to enable communication between the cellular network and the device and further expands it to a separate second entity/network that has been connected to the UE. Krco explains that a problem with connecting new devices to a UE is that the M2M provider is unaware of the new devices' properties, e.g., "existence, location and availability." Ex. 1009, 1:60-2:2.

56. Krco's solution is to embed signalling information of the second entity/network into the signalling message of the UE:

In order to enable the provisions for distributing information *about the second network 15 or the second entity 16* in the primary cellular network, the method according to the present invention comprises a further step, see FIG. 2. In this step the UE 10 sends 30 secondary data in the first message to the third entity 13,14. The secondary data comprises *information about the properties of the second network or entity*.

Ex. 1009, 4:41-47. Thus, just as the UE 10 generates signalling data "about the location and properties of the UE," the second network 15 and/or second entity 16

also generates signalling data “about the properties of the second network or entity” that is needed to establish, manage and control connection(s) between the M2M provider and the second entities/networks. *See* Petition, 15 (“***In order for the service provider to be aware of the M2M sensors’ ‘existence, location, and availability,’*** the UE sends ‘secondary data’—information about the M2M sensors’ properties—to the M2M service provider.”) (citing Ex. 1009, 1:59-2:24).

57. The secondary data is then used by the M2M service provider to establish, manage and/or control the connection to the secondary entity/network. Ex. 1009, 2:6-10 (“The object of the present invention is therefore to provide a way of improving the communication between the UE and the service provider when connecting a new functionality to the UE, ***so that the service provider can make use of the services of the functionality.***”). A POSITA would understand that the sole purpose of the service provider being made aware of the properties and availability of the second network or entity is so the M2M service provider can establish and manage its connection with second network/entity.

58. In fact, Krco expressly teaches that the secondary data is “***signalling*** information.” Krco states that its goal is to “enhance the possibility to build 3rd party services” by “providing a standardized interface for ***external entities to reach signalling information.***” Ex. 1009, 3:14-16. The “external entity” referenced is the

M2M service provider 17. *Id.* at 6:57-60 (“The role of the fourth entity is to enable **the service provider as an external entity to reach the secondary data.**”). And the only information that Krco teaches the M2M service provider 17 “reaching” is the secondary data. *Id.* Thus, a POSITA would understand the referenced “**signalling** information” is in direct reference to the secondary data, which includes information about properties of the second entity/network that is used to establish, control and manage its connection with the M2M service provider.

59. The claims of Krco also demonstrate that the “secondary data” is signalling information, just like the “location and properties” of the UE. For example, independent claim 1 recites “M2M **properties ... indicating an existence, location, and/or availability of the one or more M2M type networks or entities**” and “send[ing] the M2M properties to a core network of the cellular network that is configured to forward those M2M properties to the M2M type service provider, by embedding the M2M properties within **a message that indicates a location and/or availability of the UE** and sending that message to the core network **as part of a process to update the core network about the location and/or avail ability of the UE.**” Thus, even the claims of Krco teach that the exact same type of signalling information being conveyed for the UE is also being conveyed for the second entity/network.

60. A comparison of *Krco*'s secondary data's information elements ("IE") with that of Location Update Request and/or Routing Area Update Request further confirms that the secondary data is a form of signalling data. Ex.1009 4:64-5:63. For instance, as shown below the "secondary data" IE contains the same types of information as the Local Update Request IE:

IE of Secondary Data (Ex. 1009, 5:55-63)	IE of Location Update Request (Ex. 1009, 5:4-14)
ID (4 bits)	Mobile identity
Type (2 bytes)	Update type
Location (4 bytes)	Location area identification

A POSITA would thus understand that, just as the UE generates a Location Update Request that provides information about the properties of the UE for purposes of managing, establishing and/or controlling the UE's connection with the cellular network, the secondary entity/network generates secondary data that provides information about its properties to the service provider for the purpose of managing, establishing and/or controlling the secondary entity/network's connection with the M2M service provider.

61. Petitioner erroneously asserts that "a POSITA would have understood that *Krco*'s secondary data (i.e., M2M sensor data) is 'non-signalling' data because it is data about the M2M sensors, not signals." Petition, 37. It appears then that

Petitioner interprets “signalling data” to mean “data about a signal” while excluding “about a device”. However, the term at issue is “signalling data”—not “signal data.” As explained above, the term “signalling” has an established meaning in the art, as set forth by 3GPP Technical Specification. Ex. 1001 at 2:48-51, 5:64-67, 7:57-61, 9:19-25 (repeatedly citing 3GPP specifications). It refers to exchanging any information “concerned with” the establishment, control, and management of connections in a telecommunications network.” This includes both information “about signals” (e.g., message type) and “about devices” (e.g., mobile identity, location), so long as that information is used to establish, control and/or manage connections in a telecommunication network.

62. For instance, the “Location Area Update Request message type (Message type)” field in the IE of a Location Update Request (Ex. 1001, 5:7) is information about a signal, while the “Mobile identity” field (Ex. 1001, 5:12) is about the properties of the UE. A POSITA would nevertheless understand both to be “signalling data” because they are both used to establish, control and/or manage the connection of the UE with the network.

63. Petitioner’s interpretation is also not consistent with the use of the term “signalling” in Krco. As discussed above, Krco teaches that “providing a standardized interface for external entities to **reach *signalling*** information,

enhance[s] the possibility to build 3rd party services.” Ex. 1009, 3:14-17. The “external entity” in Krco is the M2M provider 17. *Id.* at 6:57-60. And the only information that the M2M provider “reaches” in Krco is the secondary data (i.e., the location and properties of the second entity/network) provided by the fourth entity. *Id.* (“The role of the fourth entity is to enable the service provider as an external entity to **reach** the **secondary data** provide[d] [sic] by the second network 15 or entity 16 to the third network.”). Thus, the “**signalling** information” refers directly to the “secondary data,” which is “about the second entity/network” and not “about a signal.” Krco’s use of “signalling” is thus consistent with the established meaning of “signalling” in the field of the invention to refer to both data about a signal and about a device.

64. It is also my opinion that Petitioner’s position is inconsistent with the prosecution history of the ’098 Patent. During prosecution, Patent Owner argued:

Domm discloses (paragraph 0034) a serving GPRS support node (SGSN) 303 that receives a particular type of signalling message, namely an attach request message from a mobile station (MS) 301. Further Domm discloses extracting four types of data from the attach request message, namely an International Mobile Security Identity (IMSI), a Temporary Mobile Packet Subscriber Identity (PTMSI) for a packet network, a Temporary Logical Link Identity (TLLI), and a Routing Area Id (RAI). As explained in Applicants’ Response filed

February 4, 2014, Domm expressly teaches that these data are “parameters that may be associated with a particular subscriber's connection.” Applicants therefore submit that the signalling message of Domm, like that of Johan, also does not have “inserted in it non-signalling application data generated for a machine-to-machine function by the communication module.”

Ex. 1002, 64. A POSITA would understand that Patent Owner argued that information about a device (e.g., International Mobile Subscriber Identity) and about a signal (e.g., Temporary Logical Link Identity⁴) did *not* constitute “non-signalling application data.” Thus, the prosecution history reflects that Patent Owner used the term “signalling data” in accordance with its industry meaning.

B. Whether it would have been obvious to include Benaouda’s M2M measurement data as the “secondary data” of Krco.

65. The Petitioner states that it would have been obvious to substitute or supplement Krco’s secondary data with Benaouda’s M2M measurement data. Petition, 39. Petitioner is mistaken for the reasons set forth below.

66. Petitioner’s obviousness theory is based on the incorrect statement that “a POSITA would have understood *Benaouda’s* SMS message to be a ‘signalling

⁴ A Temporary Logical Link Identifier (“TLLI”) provides the signaling address used for communication between user equipment and the SGSN (Serving GPRS Support Node) and is specified in the 3GPP specification 23.003.

message’ because it contains signalling data.” Petition, 23. Petitioner then states—based on this mistaken understanding—that *Benaouda* teaches transmitting M2M measurement data in a “signalling message,” and that it would have been obvious to include such measurement data in Krco’s Location Update Request or Routing Area Update messages. However, a POSITA would understand that an SMS message is not a wireless signalling message “of a *message type specified for carrying signalling data for managing connections* in the telecommunications network.” Ex. 1001, claims 1, 15, 17, 21.

67. A POSITA would understand that while SMS messages are transmitted over signalling *channels*,⁵ an SMS message is not itself *of a message type specified for carrying signalling data for managing connections*. Ex. 2005, 7 (defining “specify” as “to include as an item in a set of specifications”); Ex. 2006, 5 (defining “specify” as “include in specifications”); Ex. 2007, 6 (defining “specify” as “to include in a specification”); Ex. 1001, 5:64-67 (teaching that the communication module transmits a location updating request “**as specified** in subclause 9.2.15 of 3GPP TS 24.008 V8.3.0”).

⁵ A “channel” is the frequency band assigned for transmission of data, not the underlying message transmitted over a channel. Channels are also referred to as the “physical resources,” and data is transmitted over these resources. Thus, it is fair to analogize the channel to a road and the signalling messages like trucks that carry the data using the road.

68. SMS was designed to take advantage of under-utilized signalling channels by allowing *user* data (i.e., SMS messages) to be transmitted during periods of low signalling traffic. Ex. 2008, 11:17-34; Ex. 2009, 3:1-15 (“SMS was originally designed as a way to make use of under-utilized bandwidth of cellular networks in an effort to increase profitability by making use of less-used higher frequency bands.”)). As explained:

Since signaling *channels* are physically present but mostly unused during an active user connection, it is obvious to use them also **for the transmission of certain user data**. In ISDN, packet-switched data communication is therefore permitted on the D channel, i.e. the physical D channel carries multiplexed traffic of signaling data (s-data) and user (payload) data (p- data). The same possibility also exists in GSM. **Data transmission without allocation of a dedicated traffic channel is used for SMS by using free capacities on signaling channels**. For this purpose, a separate SDCCH is allocated or, if a traffic connection exists, **the SMS protocol data units are multiplexed onto the signaling data stream of the SACCH (Figure 5.2)**.

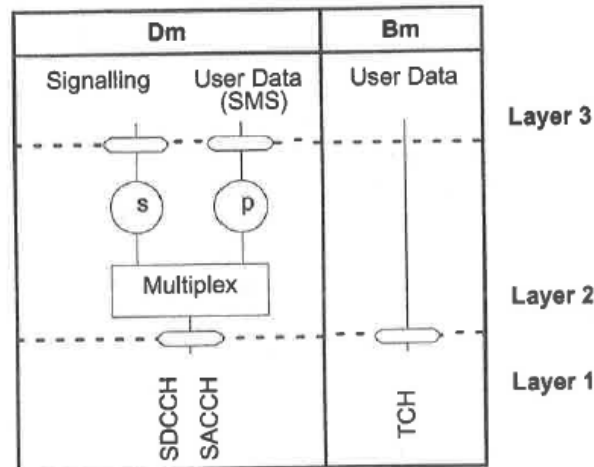


Figure 5.2 User data and control at the air interface.

The control (*signaling*) and *user* plane can be defined and implemented *separately*, ignoring for the moment that control and user data have to be transmitted across the same physical medium at the air interface and that signaling procedures initiate and control activities in the user plane. Therefore, for each plane there exists a corresponding separate protocol architecture within the GSM system: the *user* data protocol architecture (section 5.2) and the *signaling* protocol architecture (section 5.3), with an additional separate protocol architecture for the transmission of p-data on the control (*signaling*) plane (section 5.3.2).

Ex. 1008, 129-130. Stated another way, an SMS message is transmitted *over* signalling *channels* (i.e., the physical medium or “signaling resources”) but the SMS itself is of the message type specified for carrying *user* data. Such data would be included in the “TP-User-Data” field (e.g., the text “hello”) of the “SMS-Submit” message format. Ex. 1020, 47. Indeed, SMS-Submit is described in 3GPP TS 23.040

as a “short message transfer protocol data unit containing *user* data (the short message), being sent from an MS to an SC.” *Id.* at 13. Consequently, a POSITA would understand that an SMS message is a message type *specified for* carrying *user* data, not signalling data for managing connections in a network.

69. Petitioner asserts that an SMS message (e.g., SMS-Submit) qualifies as a signalling message because it contains data (e.g., TP-Message-Type-Indicator, TP-Destination-Address, TP-Reply-Path elements) that allegedly “affects the connection between the mobile station transmitting the SMS message and the short message entity receiving the SMS message.” Petition, 20-21. The problem with Petitioner’s assertion is that it would mean that *any* message of *any* type transmitted in *any* telecommunications network would be a “signalling message specified for carrying signalling data.” That is because any message transmitted over a network is going to contain data designed to ensure that the message reaches its intended destination (e.g., destination address, error checking data).

70. For example, an IP packet includes a “header” and “payload.” Ex. 1008-2, 253.

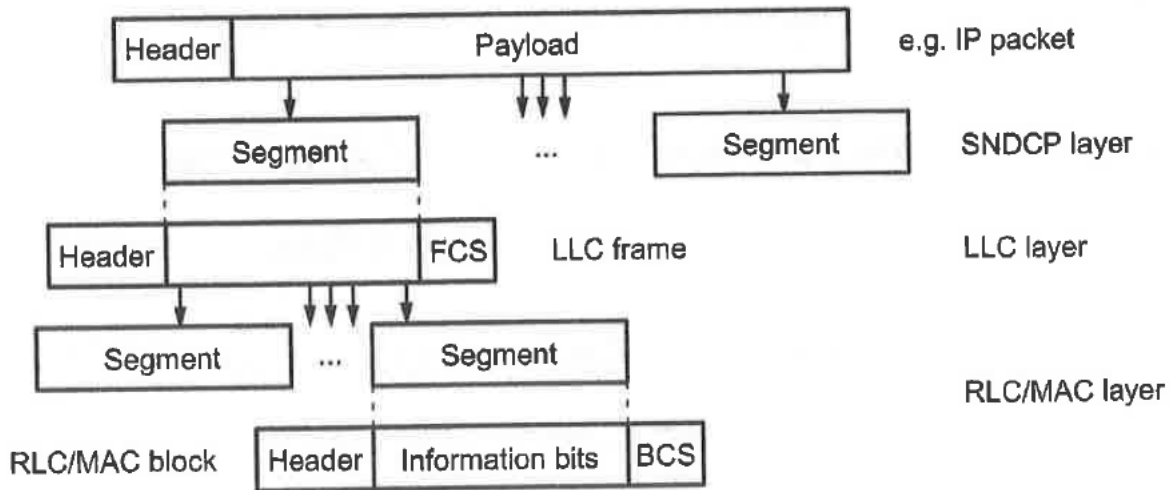


Figure 8.8 Data flow and segmentation between the protocol layers in the MS.

The payload contains, e.g., the user data, while the “header” contains, among other things, a “Destination IP Address” field (equivalent to, e.g., the TP-Destination Address in an SMS-Submit) and “Type-of-Service” field (comparable to TP-Message-Type-Indicator in an SMS-Submit). As such, under Petitioner’s mistaken theory any IP packet transmitted over the Internet would qualify as a “signalling message” simply because it includes a destination address.

71. Petitioner also argues that because an SMS “can be used for user data or signalling data” an SMS message is a “signalling message *specified for* carrying *signalling* data for managing connections in the telecommunications network.” Petition, 18-19. However, a POSITA would not understand an SMS to be “specified for” transmitting signalling messages even though a user can elect to include

signalling information in the TP-User-Data field. Rather, a POSITA would understand that SMS is specified for transmitting *user* data (e.g., in 3GPP TS).

72. Petitioner cites a patent publication (Ex. 1021) discussing the use of “SMS service to convey signalling information” in its specific embodiments. A POSITA would understand that the mere fact that a user can include signaling data as the user data in an SMS message does not mean that an SMS message is “specified for” transmitting “signalling” messages. As discussed in the preceding paragraph, SMS is “specified for” carrying user data in the TP-User-Data field. The Petition does not identify any specification (e.g., a 3GPP specification) that describes or considers SMS to be a protocol “specified for” for carrying signalling data for managing connections, and I am unaware of any such specification existing.

73. Petitioner also cites to Benaouda’s teachings about the “use of out-of-band signalling sources” as part of SMS services. However, this is merely referring to the underutilized signalling *channels* (i.e., resources) that SMS messages are transmitted over. Ex. 1008, 129-130. The term “out-of-band signalling” denotes the exchange of signalling information in a separate band from the data/voice stream and the language “out of band” refers to frequency (frequency band), which is what channels are.

74. While Petitioner is mistaken that Benaouda’s SMS message is a “signalling message” as claimed, even if an SMS message could qualify as such and even if a POSITA would have been motivated to apply the teachings of Benaouda to Krco, a POSITA still would not have found the claims obvious.

75. Krco teaches embedding data about the properties of a second entity/network into a signalling message (e.g., Location Update Request or Routing Area Update request) so that an M2M provider is made aware of the “availability, location and existence” of the second entity/network. Ex. 1009, 1:61-64, 4:24-52. In stark contrast, Benaouda embeds M2M measurement data in a very *different type* of message—namely a Short Message Service (“SMS”) text message. Ex. 1010 ¶ [0014], [0023]. Moreover, Benaouda touts the effectiveness of transmitting M2M measurement data in an SMS message:

Use of the SMS technology *meets the small data bandwidth and real-time transmission requirements for M2M communications*, and *it offers increased capacity over the prior wireless methodologies*. Employing SMS also provides a wireless data solution by design. By default, it takes advantage of a nationwide SMS network infrastructure that is fully integrated, already exists and is built upon industry-standard digital wireless technology.⁶

⁶ Nowhere does Petitioner explain why a POSITA would elect to include the M2M

Id. ¶ [0006]. Even if one were to assume that it would be obvious to combine the teachings of Krco and Benaouda, the combination would merely result in modifying Krco to rely on SMS text messaging to particularly transmit the M2M sensor measurement data, while still relying on the Location Update Request / Routing Area Update messages (i.e., “signalling message”) for transmitting the M2M signalling data (i.e., the “properties of the second network/entity” or “secondary data”) since the object of the invention in Krco is clearly to allow transmitting the “secondary data” about the properties of the secondary network/entity (M2M properties) in a different way compared to the M2M measurement data. See Ex.1009 2:60-3:99; 4:24-40, Claims 1, 12 (distinguishing how “M2M properties” (i.e., “secondary data”) are transmitted to how “M2M data” is transmitted). Therefore, such a combination would not render any claims obvious because the combination would still lack the inclusion of M2M measurement data (i.e., the alleged “non-signalling application data”) in Krco’s Location Update Request / Routing Area Update message.

76. Petitioner offers several arguments to justify taking the M2M measurement data from Benaouda’s SMS message and including it in the vastly

sensor data of Benaouda in the signalling message of Krco, when Benaouda expressly teaches that SMS “meets the demands” of M2M data transmission.

different Location Update Request / Routing Area Update message of Krco. Petitioner asserts that it would have been obvious to include Benaouda's M2M measurement data in Krco's Location Update Request / Routing Area Update message because it "would have involved simple ***substitution of one known element for another*** to obtain predictable results." Petitioner, 23. I understand that "substitution" means *replacing* one thing *with another*. Ex. 2005, 8; Ex. 2006, 6; Ex. 2007, 7. Petitioner is therefore proposing ***replacing*** the "existence, location and availability" data of Krco with the M2M measurement data of Benaouda. This substitution would not have been obvious, because it would fundamentally destroy the only stated purpose of Krco, which is to inform the M2M provider about the existence, availability and location of a second entity/network that has been newly connected to the UE. Ex. 1009, 1:59-63. Specifically, if the M2M properties data of Krco were substituted for the M2M measurement data of Benaouda, the M2M provider would not be informed of the existence, availability, or location of the newly connected second entity/network as taught by Krco. This would render Krco inoperable for its intended purpose, which is to provide M2M properties information about a secondary network/entity to an M2M service provider.

77. Petitioner also asserts the proposed combination would have been obvious because it allegedly "would have involved simply substituting, ***or***

supplementing, Krco’s M2M sensor data with Benaouda’s M2M measurement data.” Petition, 24. As explained below, a POSITA would not have found it obvious to supplement Krco’s secondary data to include M2M measurement data as well.

78. Petitioner argues that Krco discloses embedding M2M sensor properties (e.g., identity, type, location) in a “ExtDeviceInfo” information element of a Location Update Request signalling message, and that a POSITA would have understood that data sent in this manner “was not restricted, and that any data, including the M2M measurement data discussed in *Benaouda*, ***could be*** included in the ExtDeviceInfo information element.” Petition 23. Petitioner also argues that the name ExtDeviceInfo “indicates that it ***could be*** extended to include any sort of device information.” Petition, 24. Even accepting these statements as true, the mere fact that the ExtDeviceInfo fields could hypothetically be modified to include M2M measurement data does not constitute a reason that a POSITA would have sought to make that modification.

79. Petitioner argues that “ExtDevice***Info***” indicates that it could include “any sort of device ***information***.” Petition, 24. However, a POSITA would understand that Benaouda’s M2M measurement data is not “device ***info***” because measurement data is not information *about the* device. Nothing in Krco teaches or suggests that M2M measurement data could be “secondary data.” Instead, Krco

teaches that the M2M measurement data is transmitted over the cellular network by means *other* than a signalling message. *See e.g.*, Ex. 1009, Claim 1 (distinguishing the transmission of “M2M data” (e.g., sensor or alarming data) over the “cellular network” from “M2M properties” (i.e., secondary data) transmitted over a “core network”), 1:23-28 (explaining that UEs transmit data over the Internet). Consequently, there is no basis for a POSITA viewing “ExtDevice***Info***” as a suggestion to include M2M measurement data, or any other non-device info for that matter.

80. Petitioner’s statement that “the name of this information element—ExtDeviceInfo—indicates that it could be ***extended*** to include any sort of device information” is incorrect. Petition, 24. Petitioner seems to incorrectly imply that a POSITA would understand “Ext” to mean “extended.” A POSITA would instead recognize and understand “Ext” to mean “external,” because the secondary data is information about an *external* device/network (i.e., the second entity or network). For example, Krco teaches that the information element “ExtDeviceInfo” includes the “identity of an ***external*** device” and “location of the ***external*** device relative to the UE position.” Ex. 2009, 5:55-63. In fact, Krco does not use the word “extended” (or any of its variants). As such, a POSITA would not understand “ExtDeviceInfo” to refer to “extended” device info.

81. Further, Petitioner states that Ananthanarayanan is “*an example of why it would be obvious*” to include Benaouda’s M2M measurement data in Krco’s Location Update Request signaling message,” that “Ananthanarayanan’s disclosure of bundling application-layer data in the access channel signaling message therefore *suggests to a POSITA why it would be obvious* to include data like Benaouda’s M2M measurement data,” and a POSITA “would have found it obvious to transmit M2M measurement data via the Location Update Request message, at least because a POSITA *would have been aware of similar teachings*, such as those disclosed by Ananthanarayanan.” Petition, 24-25, 41. However, the mere fact that a POSITA may have been aware of Ananthanarayanan’s teachings, or that those teachings allegedly provide an example of a missing claim feature, does not mean that a POSITA would have had a reason to combine those teachings with the teachings of Krco.

82. The Petition does not provide any explanation or justification for its assertion that a POSITA would have had a reason to combine the teachings of Ananthanarayanan with Krco. A POSITA would have understood that Ananthanarayanan is designed for a different purpose (e.g., improving “Push-to-talk (PTT)”⁷ service) and involves a different type of application data (e.g., “a PTT call

⁷ PTT is a walkie-talkie type function provided over a cellular telephone network, which is not related to M2M communications.

request”) transmitted in a different type of message. Ex. 1012 ¶¶[0006]-[0007], [0032], [0034], [0037], [0038], [0044], [0048]. The Petition does not explain why Ananthanarayanan is including application-layer data in its message, and how the purpose of including that application-layer data in Ananthanarayanan in anyway relates to the fundamentally different system of Krco. Accordingly, it is entirely unclear why a POSITA would have been motivated to implement any aspect of Ananthanarayanan in Krco. To the contrary, a POSITA would have had no reason to believe that Ananthanarayanan’s inclusion of a PTT call request in its PTT message would have any application or relevance to Krco.

83. Petitioner asserts that:

A POSITA would have recognized that applying such a basic technique, bundling M2M measurement data into a signaling message from a UE, would have yielded predictable results and an improved system, such as a UE that can more efficiently transfer M2M measurement data by bundling this data in a Location Update Request message.

Petition, 25 (citing Ex. 1003 ¶102). Petitioner does not explain how including M2M measurement data in Krco’s Location Update Request would somehow allow for “more efficiently” transferring M2M measurement data. For example, Krco teaches that UEs leverage the standard transmission services provided by a cellular network (e.g., a CS or PS connection) to transmit data. *See* Ex. 1009, 1:24-28 (explaining that

UEs access Internet, use MMS and other services to transmit data), Claim 1 (describing forwarding “M2M data, via the cellular network,” which a POSITA would understand to include packet-switched or circuit-switched connection). A POSITA would have thus understood that the M2M measurement data of Krco would have been transmitted using a conventional CS or PS connection at the time, while the secondary data related to the properties of the secondary network/device is being transmitted via a signalling message in a similar fashion to transmitting signalling data related to the properties and availability of the UE.

84. For example, it was well-known that a UE could establish a PDP Context in the PS domain of the cellular network, and could then leverage the Internet to further transmit M2M user data to entities external to the cellular network such as the M2M service provider. Petitioner does not explain how transmitting M2M sensor data (user data) in a signalling message is somehow “more efficient” than doing so via any of these well-known transmission means. Petitioner does not provide any baseline for comparison, making it impossible for Petitioner to demonstrate that its proposed combination would provide for a “more” efficient transmission. In order to determine whether one thing is “more efficient” than another thing, the “another thing” must be discussed and analyzed. There is no such analysis or discussion in the Petition.

85. Absent the benefit of hindsight, a POSITA would not have recognized that including M2M sensor measurements (M2M sensor data) into a Location Update Request would have yielded any improvements, let alone “improved efficiency.” As previously discussed, Benaouda transmits M2M measurement data in an SMS message and explains that SMS transmission “meets the ... requirements for M2M communication, and it offers increased capacity over the prior wireless methodologies.” Ex. 1010 ¶ [0006]. To the extent a POSITA would have recognized any potential improvements to Krco based on Benaouda, it would have been that the M2M measurement data of Krco could be transmitted via SMS to achieve the explicit improvements discussed in Benaouda.

86. Petitioner asserts that a POSITA would have had a reasonable expectation of success of inserting Benaouda’s M2M measurement data into Krco’s Location Update Request because (1) the “ExtDeviceInfo” information element is allegedly not limited to any unique formatting or data type and (2) Benaouda and Ananthanarayanan both allegedly teach transmitting application-layer data (M2M measurement data in the case of Benaouda) in a signalling message. Petition, 26-27. Even if both of these statements are accepted as true, they do not actually address the issue of reasonable expectation of success.

87. The purpose, function, and capabilities of the signalling message of Krco are fundamentally different than the purpose, function, and capabilities of the SMS message of Benaouda, as the SMS message of Benaouda is *designed to carry user data* (e.g., M2M measurement data) as I explained earlier. Simply because Benaouda teaches that using SMS messages is suitable for transmitting M2M measurement data, does not mean that a Location Update Request / Routing Area Update Request message would be suitable for the transmission of that same data. The Petition does not provide any discussion or evidence demonstrating that a POSITA would have recognized that a Location Update Request or Routing Area Request would be capable of effectively transmitting M2M *measurement* data, which would be expected to be more voluminous and to be transmitted on a more frequent basis than the M2M signalling information in Krco. A POSITA would have recognized that signalling messages specified for carrying signalling data for managing connections in cellular networks had varying data structures and limited data capacity, are sent less frequently and usually in specific situations (e.g., registering to the network or updating the network about the current location), and the consideration whether additional data (e.g., M2M measurement data) could and should be included would have required careful analysis.

C. Whether Krco teaches a “communication module” / “communication apparatus” / “communication device” that (1) generates non-signalling application data and (2) transmits said data in a signalling message (Claims 1, 15, 17, 21)

88. Each of the independent claims requires a communication module/apparatus/device⁸ configured to: (1) generate “non-signalling application data”;⁹ and (2) “transmit a “wireless signalling message” containing the “non-signalling application data” to a telecommunications node.”¹⁰ A POSITA would thus understand that the communication module/apparatus/device must be configured to perform both of these steps.

89. The claim language is consistent with an embodiment in the '098 specification, which has a communication module 2 that “**comprises**” a sensor 10,

⁸ For purposes of this Declaration only, I do not dispute Petitioner’s assertion that “communication module” would be understood to be the same as a “communication apparatus” or “communication device.” Petitioner 32, 60. Thus, references to “communication module” herein should be viewed as equivalent to “communication apparatus” and “communication device.”

⁹ See Cls. 1, 15, 17 (“non-signalling application data **generated ... by the communication [apparatus/module],**”); Cl. 21 (“**communication device** comprising . . . a processor” for “**generating** non-signalling application data”).

¹⁰ See Cl. 21 (“**communication device** comprising a transmitter” for “**transmitting** ... said signaling messages ... to a signalling termination node”), Cls. 1, 15, 17 (reciting “**receiving** a wireless signalling message **from said communication [module/apparatus]** ... at the signalling termination node,” which necessarily means that the communication module/apparatus is capable of transmitting the signalling message.).

processor 11, encapsulation module 12, and transmitter 13. Ex. 1001, 4:34-52. The sensor 10 generates “user data U” which is processed by processor 11, inserted by the encapsulation module 12 into “signalling message S” and then transmitted to a telecommunications network 1 by the transmitter. *Id.* The term “comprises” means that the sensor is part of the communication module 2, rather than the sensor being an external device.

90. Figure 1 of the patent clearly depicts the embodiment where sensor 10, processor 11, encapsulation module 12, and transmitter 13 are all part of the communication module 2:

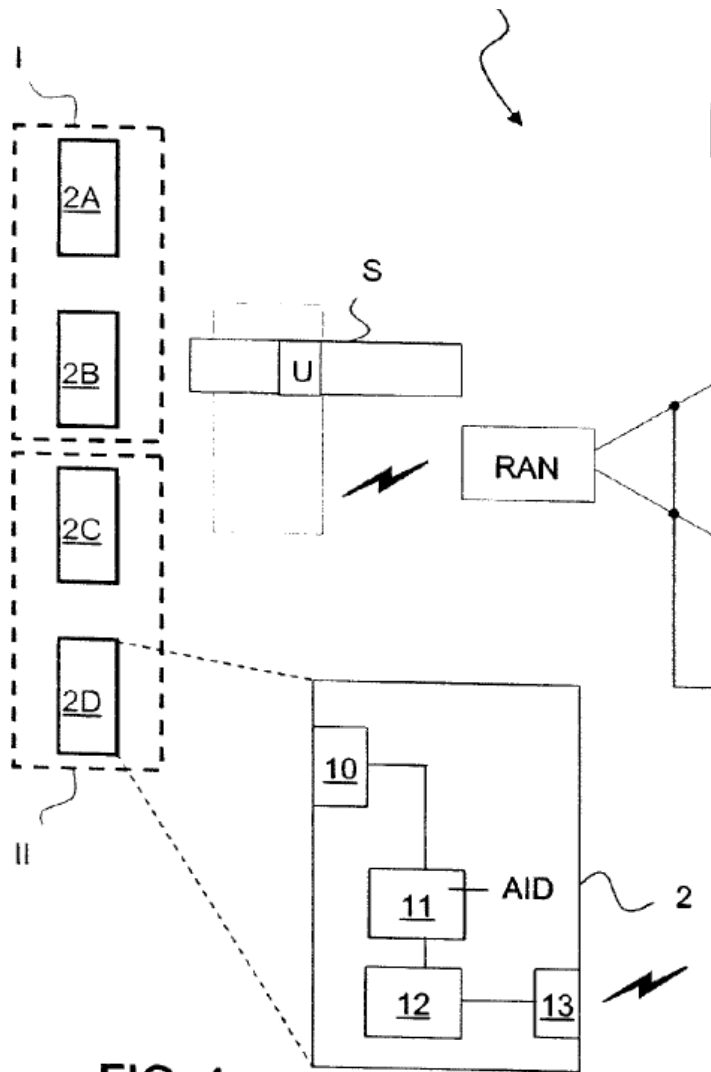


FIG. 1

Excerpt from Figure 1, '098 Patent

Based on the statement from the specification that the communication device “comprises” sensor 10, and the disclosure of Fig. 1 presented above, a POSITA would clearly understand that the sensor 10, processor 11, encapsulation module 12 and transmitter 13 are all components of the communication module 2. Furthermore, all those components are illustrated on Fig. 1 within a single, solid line box

(communication module 2). This is in contrast to roman numerals I and II, which identify boxes formed of dashed lines grouping separate “communication devices” 2A, 2B, 2C, 2D. Ex. 1001, 4:6-15 (explaining that element I identifies multiple communication modules of a “first organization” and element II identifies communication modules of a “second organization”). If communication module 2 was intending to convey that the components within its boundaries were external/separate devices, a POSITA would thus expect the box around communication module 2 to also be dashed.

91. Consequently, based on the disclosures above, a POSITA would understand that the required communication module 2 both (1) generates non-signalling application data (via sensor 10) that is inserted/embedded into the signalling message (via encapsulation module 12) and (2) transmits the wireless signalling message (via transmitter 13). This is consistent with the plain claim language.¹¹

¹¹ While the '098 specification also explains that communication module 2 may be “communicatively connected” to sensor 10 (Ex. 1001, 4:34-37), a POSITA would understand that an embodiment where the sensor 10 is external to the communication module 2 and “operatively connected” is not within the scope of the independent claims. This is because the claims expressly require that the communication module generates the non-signalling application data, which would not occur if the sensor was an external device.

92. Petitioner initially identifies the UE 10 as the alleged communication module (Petition, 31-32),¹² the Location Update Request / Routing Area Update message (i.e., the “first message”) as the signalling message (Petitioner, 34-35), and the UE location and properties data (i.e., the “secondary data”) as the non-signalling application data (Petition 36-39). However, the UE 10 of Krco does not *both* (1) generate the alleged non-signalling application data and (2) transmit said data as part of a signalling message. While Krco teaches that the UE does transmit the first message (alleged “signalling message”), the UE itself clearly does not generate the secondary data (alleged “non-signalling application data”). Rather, the UE simply *forwards* the “secondary data” that was generated by the external second entity/network and received by the UE. *See e.g.*, Ex. 1009, Abstract (“At least one second network or at least one second entity is **using a User Equipment (UE) for forwarding** information between the second network or entity and a service provider, wherein the second network or entity provides the UE with information about its properties.”), 2:13-17, 2:27-32, 2:46-50, 3:55-59; Petition, 15 (acknowledging that in Krco “the UE **forwards data from the** M2M sensors to an

¹² Petitioner later disingenuously characterizes the sensor and UE as a “combined UE-sensor device (*i.e.*, the ‘*communication module*’).” Petition, 38. As explained in Section V.A.3 below, Petitioner’s characterization of the sensor (“second entity 16”) and UE 10 as a “combined” device is simply wrong.

M2M service provider”); *id.* at 31 (explaining that in Krco “[t]he UE ‘communicates wirelessly’ with the core network to **forward information** between sensor devices connected to the UE and a machine-to-machine (M2M) service provider.”) (citing Ex. 1009 at 3:52-4:16). Because the UE of Krco does not generate the alleged “non-signalling application data,” it cannot and does not meet all of the requirement of the claimed “communication module.”

93. A POSITA would further recognize that other distinctions exist. Krco is necessarily premised on an *external* device/network (i.e., the “second entity” / “second network”) generating the secondary data and then providing this secondary data to the UE. The UE then embeds this secondary data into the first message for transmission to the core network.

94. The invention in Krco addresses a situation in which a new external device providing certain functionality is connected to the UE. The UE then needs to forward information about the external device further to the network. As explained in the “Background:” “[t]he role of the UE is changing, and there is now the possibility to connect *new* functionality, for instance in form of a *separate* unit, to the phone.” Ex. 1009, 1:29-31, 1:43-59 (discussing a sensor using short range wireless communication (e.g., Bluetooth) to communicate via an UE “to the rest of

the world”). Krco then discusses the problem that such newly connected devices can present:

As we go towards the future internet, more and more such devices will be introduced (Internet of Things). The only way to inform the backend service providers about ***the existence, location and availability*** of such sensors is by using a purposely built user application on an UE. The above problem is not only apparent in mobile phones, but also other devices whose sole intention is to provide sensor communication, such as M2M devices for AMR (Automatic Meter Reading) or security applications that have to depend on ***purposely built availability schemes*** built on for instance SMS etc.

Ex. 1009, 1:60-2:2. Immediately after presenting the problem, Krco states: “***The object of the present invention*** is therefore to provide a way of improving the communication between the UE and the service provider when connecting a ***new*** functionality to the UE, so that the service provider can make use of the services of the functionality.” Ex. 1009, 2:6-10. In other words, Krco expressly teaches that the goal of the invention is to inform a M2M service provider of the “existence, location or availability” of ***separate, new*** devices/networks connected to a UE.

95. In view of the above, a POSITA would understand that Krco is premised on having two separate devices—i.e., a second entity / network that generates the “secondary data” and a separate UE 10 that receives the “secondary

data” from the second entity / network, inserts it into a “first message” and transmits the “first message” to the core network. *See e.g.*, Ex. 1009, 2:13-19 (“At least one second network or at least one second entity is using the UE for forwarding information between the second network or entity and a service provider, where the second network or entity provides the UE with information about its properties.”) If the second entity/network and UE were part of the same device it would undermine the stated purpose of Krco’s invention, which is to inform a M2M server about the “existence, location and availability” of a *separate* and *new* communications device (e.g., a sensor) that has been connected to the UE.

96. Petitioner alleges that the UE and the second entity (e.g., a sensor) “could be considered” a single, integrated device, while also suggesting that it would have been obvious to combine the UE and sensor into a single device. Petition, 31-32, 38-39. Petitioner is mistaken for the reasons discussed below.

97. There are many reasons a POSITA would not consider the separately depicted and described second entity/network and UE of Krco to be a “single, integrated device.” For one, Krco teaches that the purpose of the invention is to inform a M2M server about “the existence, location and availability” of “*separate units*” that are connected to UEs to provide “*new*” functionality. Ex. 1009, 1:29-33.

Thus, combining the second entity/network and UE into a single device would destroy Krco's stated goal.

98. A POSITA would not understand or consider the second network / second entity and UE 10 to be a single device, because Figure 1 of Krco (reproduced below) clearly depicts the second network 15 and second entity 16 as separate and distinct devices that are connected to the UE 10 via a "wireless or wired connection" 11:

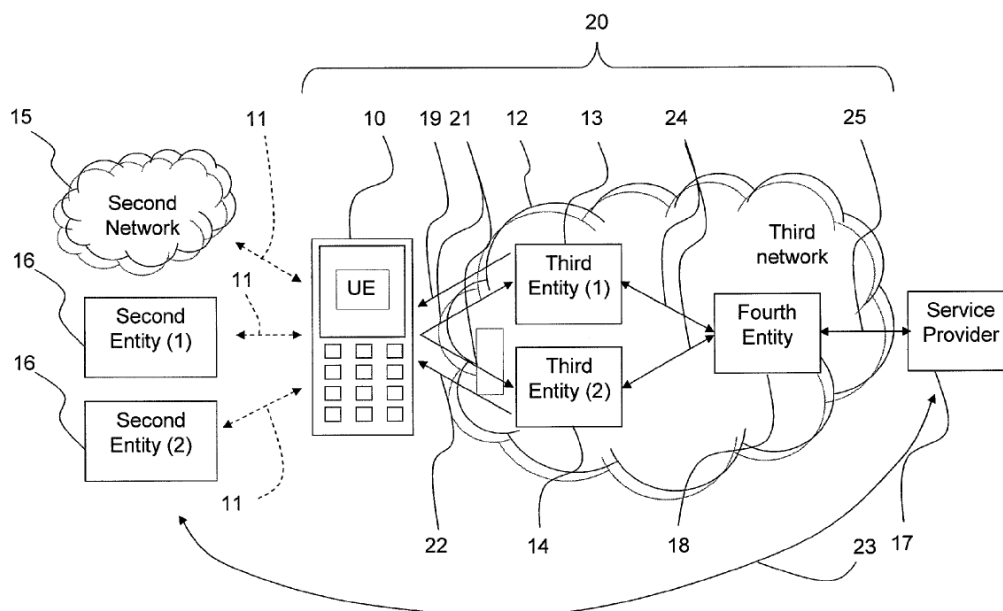


FIG 1

Ex. 1009, 3:57-59. As discussed above, the specification describes the UE and second entity/network as separate devices, and Figure 1 clearly illustrates them as separate devices.

99. A POSITA would also not understand or consider the second network / second entity and UE 10 to be a single device because a second “entity” is by definition independent and separate unit from the UE. *See e.g.*, Ex. 2006, 4 (defining “entity” as “thing with *distinct* existence”); Ex. 2007, 5 (defining “entity” as “something that exists as a particular and *discrete* unit”). A POSITA would understand that elements 15 and 16 are referred to as “second” networks or entities precisely because they are *not* part of UE 10. A POSITA would further understand that the “first entity” is the UE, and the “second network” / “second entity” is “second” because they are separate from the UE.

100. A POSITA would also not understand or consider the second network/second entity and UE 10 to be a single device, as each of the second entity/network and UE is independently capable of communication with an external device. Specifically, the UE is capable of receiving data from the external second entity/network and transmitting data to the external third entity. Ex. 1009, 4:17-47. Likewise, the second entity/network is independently capable of transmitting data to the external UE, which the UE then embeds into the “first message” and transmits to the third entity. Ex. 1009, 3:52-59.

101. The fact that Krco teaches that the secondary data generated by the second entity/network is transmitted as part of the first message in a field named

“**ExtDeviceInfo**” also demonstrates that the UE and second entity/network are separate devices. Ex. 1009, 5:41-64. (“The secondary data preferably consists in an information element in the first message, which may be called ExtDeviceInfo.”). ExtDeviceInfo is shorthand for “**External** Device Info,” which refers to the fact that the second entity is **external** (i.e., not part of) the UE 10. See Ex. 1009, 5:58-62 (referencing “external device” multiple times as part of the “ExtDeviceInfo” information element). Also, Krco teaches that the secondary data includes information about the “Location of the **external** device [i.e., “second entity”] relative to the UE position.” Ex. 1009, 5:45-63. It is clear that there would be no need for location information about the second entity/network if they were part of the UE.

102. Krco also teaches that the UE is “part of the primary cellular network 20” but the second entity/network is not, which further evidences to a POSITA that the UE and second entity/network are separate devices. Ex. 1009, 4:15-16 (“The UE 10 and the third network 12 are part of the primary cellular network.”). A POSITA would understand that if the UE and second entity/network were a “single” device, then the second entity/network would necessarily be “part of” the cellular network 20 since the UE 10 is part of the primary cellular network. Thus, the fact that Krco does not discuss the second entity/network as part of the cellular network also indicates that in Krco the second entity/network is a separate device.

103. The fact that Krco teaches that the UE communicates with the second entity/network “through a wireless or wired connection 11” also indicates they are separate devices. Ex. 1009, 3:57-60. Specifically, the only reason a “wireless or wired connection” would be needed for “communication” is because in Krco the second network/entity and the UE are two separate, non-integrated devices. In other words, if the second entity/network and UE were all part of a single device, there would be no need to say they could be connected via “wireless or wired connection”—it is inherent that the components of an electrical device are connected inside the device. As an example, a router and laptop can be connected by a “wireless or wired connection,” but one of ordinary skill would not interpret that to mean the router and laptop could be considered a “single” or “integrated” device. It would also be illogical for a component to be “wirelessly” connected to another component within the *same* device. Thus, the reference to a “wireless” connection also indicates that the connection is between two separate devices.

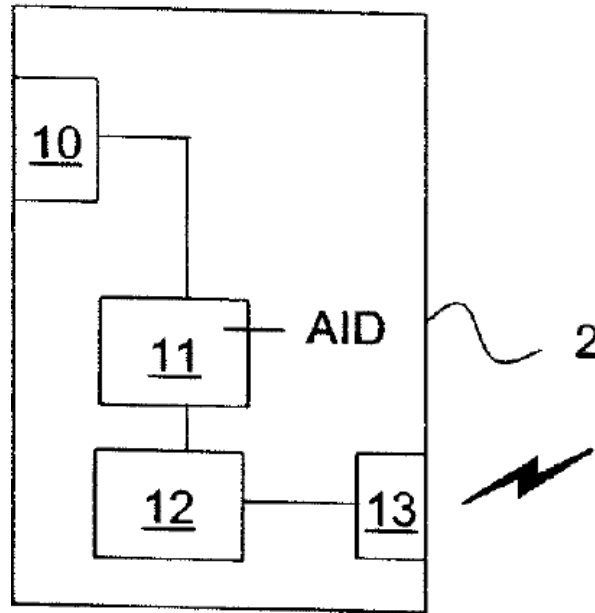
104. A POSITA would also recognize that Krco’s Figure 1 depicts connection 11 in a similar manner as the communication links 24 and 25, which clearly involve the transmission of information between two separate devices (e.g., the third entity and fourth entity). This further indicates that the second entity/network and UE are separate devices. The claims of Krco also confirm that

the second entity/network are external to the UE. For example, all of the independent claims require a UE that is in “**short range wireless communication** with one or more machine-to-machine (M2M) type networks or entities [i.e., the “second network” or “second entity”].” Ex. 1009, claims 1 and 12. This is consistent with the specification’s express teaching that the UE and second entity are separate devices that communicate via Bluetooth. Ex. 1009, 1:53-58.

105. Petitioner cites Exhibit 1017 for the alleged teaching that a “remote station” can have “integrated sensors” to suggest that the UE 10 and second entity/network of Krco could be “integrated.” Petition, 31. A POSITA would not consider these teachings to have any relevance to Krco, which does not mention or discuss a “remote station” or an “integrated sensor.” As previously explained, it is clear based on Krco’s express teachings that the sensors (e.g., second entities) are not “integrated” with, or part of, the UE 10. The only relevance of Exhibit 1017 is that it uses the language “wired or wireless” in reference to the connection between *separate* devices. *See* Ex. 1017 ¶ [0045] (explaining in reference to Figure 1, “[c]ommunications between an *application server 106* and *its remote stations 102* are normalized by the communications server 108 so that the need for a variety of **wired and wireless** protocols remains transparent to the application server 106.”).

That is exactly how “wired or wireless” is used in Krco to refer to the connection between *separate* devices (i.e., UE and second entity/network).

106. Petitioner also asserts that its argument that the UE and second entity of Krco could be considered a “single, integrated device” is consistent with the following statement from the ‘098 specification: “As illustrated in FIG. 1, a communication module 2 comprises or is communicatively connected to a sensor 10.” Ex. 1001, 4:34-35 (cited by Petition, 31-32). However, Figure 1 (excerpt reproduced below) clearly depicts sensor 10 **as part of** the communication module 2, which is consistent with the teaching that “communication module 2 **comprises** ... a sensor 10” and the claim requirement that the non-signalling application data must be **generated by** the communication module (rather than a sensor external to the communication module):



Excerpt from Figure 1, '098 Patent

107. To the extent Petitioner is inferring that “communicatively connected” means that a sensor external to the communication module 2 could be considered part of the communication module, Petitioner is mistaken. As shown, the sensor 10 of Figure 1 is both part of the communication module (consistent with the “comprises” language) and in communication with other components of the communication module (consistent with the “communicatively connected” language).

108. Furthermore, as discussed earlier, while a communication module connected to an external sensor via a wireless or wired connection would be “communicatively connected” to the external sensor, such an embodiment is not

within the scope of the claims because the claims require that the communication module itself (not an external sensor) generates the non-signalling application data.

109. Petitioner also suggests that it would have been obvious to combine the UE and second entity of Krco into a single device. Petition, 31 (citing *In re Larson* for proposition that “use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”). Petitioner does not provide any explanation or reasoning for why that is allegedly the case in Krco. As discussed extensively above, integrating the second entity/network into the UE would destroy the purpose of Krco’s invention—i.e., making an M2M server aware of the existence, location, or availability of a *separate* and *new* device connected to the UE and using the UE to forward information about the properties of the newly connected device to the service providers. Ex. 1009, 1:29-31 (explaining that “[t]he role of the UE is changing, and there is now the possibility to connect *new* functionality, for instance in form of a *separate* unit, to the phone”). Consequently, not only would it not be obvious to combine the UE and second entity into a single device, but a POSITA would be strongly discouraged from doing so.

110. In conclusion, Krco does not disclose a communication module that both (1) generates non-signalling application data and (2) transmits a signalling message containing said data, as required by all independent claims. Petitioner’s

contention that a POSITA would understand that the UE and second network/entity “could be considered” a “single, integrated device” is inconsistent the plain teachings of Krco, which depict and describe those devices as separate and explain that their separateness is fundamental to the purpose of Krco. Nor would it be obvious to combine Krco’s UE and second entity as a single device, because Krco is premised on the second entity/network being “separate” and “new” devices connected to an existing UE 10.

D. Whether Krco teaches “avoiding to establish a complete circuit-switched or packet-switched connection”

111. Dependent claims 13, 20, and 25 require transferring the non-signalling application data to the telecommunications network “while *avoiding to establish* a complete circuit-switched or packet-switched connection between said communication [module/apparatus/device] and said telecommunications network.”

112. As the ’098 patent explains, “[B]y inserting the user data in the signalling message(s), it is possible to rapidly transmit data to the telecommunications network, while resources can be saved *since it is not required to establish a complete circuit-switched or packet-switched connection* between the communication module and the telecommunication network.” Ex.1001, Abstract, 2:8-16, 3:3-20. Consequently, the ’098 patent recognizes that the circuit-switched

(CS) or packet-switched (PS) connection ordinarily required for the transmission of user data within the cellular network can be avoided to preserve resources. For example, rather than establishing a PS connection in the cellular network and then transmitting M2M measurement data from the communication module to the M2M service provider(s), which are, e.g., connected to the Internet, the data is instead transmitted in a signalling message within the cellular network.

113. A POSITA would understand Figures 2 and 3 of the '098 patent to provide examples of avoiding the establishment of a complete CS/PS connection. Figures 2A and 2B are flow charts directed towards “circuit-switched methods,” and Figures 3A and 3B are flow charts directed towards “packet-switched methods.” Ex. 1001, 3:62-67. In each of those embodiments, the communication module 2 generates the user data (“U”), embeds it into an IMSI attach (for CS) or GPRS attach request (for PS), and then transmits it to the core network as part of a signalling message (“S”). *See* Ex. 1001, 5:52-7:9 (discussing steps of Fig. 2A), 7:9-44 (discussing steps of Fig. 2B), 7:45-8:45 (discussing steps of Fig. 3A), 8:46-14 (discussing steps of Figure 3B). However, the method of Figures 2A/3A differs from the method of Figures 2B/3B with respect to their later steps. Those methods are discussed below in more detail.

114. As shown in each of Figures 2A and 3A (annotated below), the attach request is initially accepted (step 4). By accepting the attach request “a confirmation [e.g., a delivery report as in step 5d] may be received that the user data has been delivered to the data processing center, thereby e.g. allowing the communication module to return to a sleep mode, to refrain from attempting to transmit the same user data again or to delete the user data.” Ex. 1001, 2:59-63.

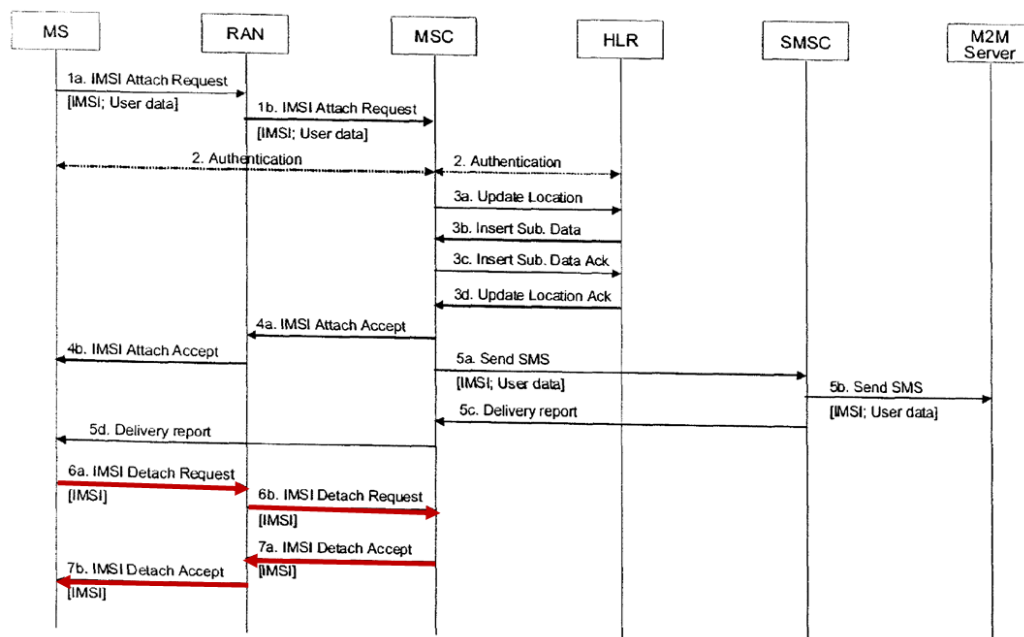


FIG. 2A

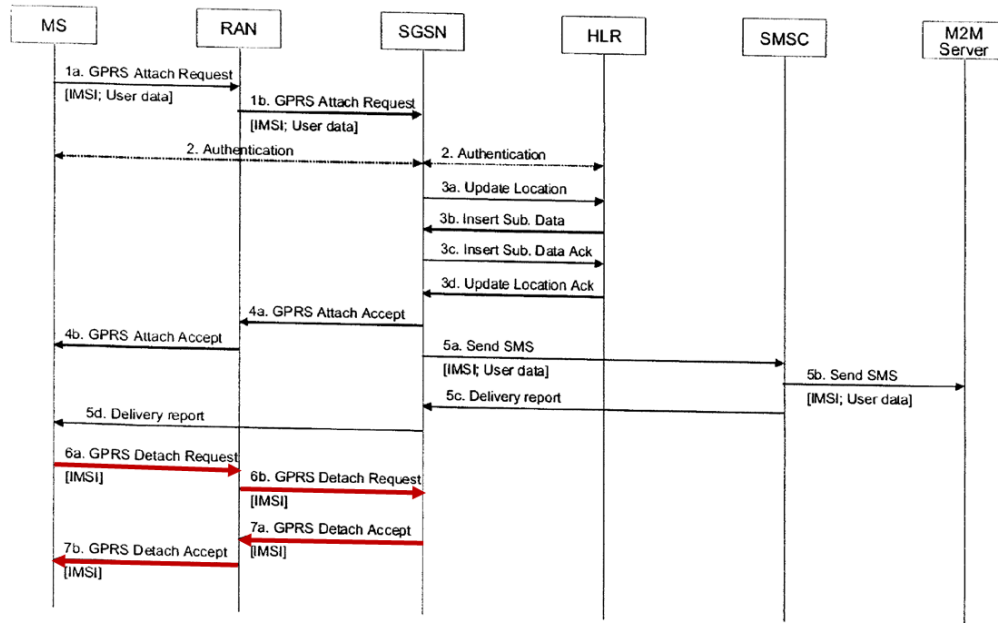


FIG. 3A

115. After receiving the delivery report, the communication module transmits a detach request (step 6) that is ultimately accepted (step 7). Ex. 1001, 5:53-56, 6:45-54 (discussing detach in Fig. 2A), 7:45-49, 8:33-42 (discussing detach in Fig. 3A).

116. A POSITA would understand that by accepting the IMSI/GPRS detach request the communication module “detaches” from the network and therefore no CS/PS connection would be present (i.e., no CS/PS connection that would allow further transmission of user data between the module and the network is established). The lack of an established CS/PS connection (respectively the fact that the communication module is detached from the network) saves network resources.

117. As discussed, ordinarily a CS or PS connection is required for the transmission of user data from the user terminal to the network and the user terminal has to be attached to the network. As an example, in a GPRS system the UE must be attached to the network for a PDP Context (i.e., a PS connection as asserted by the Petitioner) to be activated. *See* Petition, 48 (acknowledging that “the PDP context establishment procedure occurs *after* the UE is attached (i.e., registered) with the network”) (emphasis in original). Petitioner’s annotated version of Figure 6.138 of Exhibit 1016 shows this:

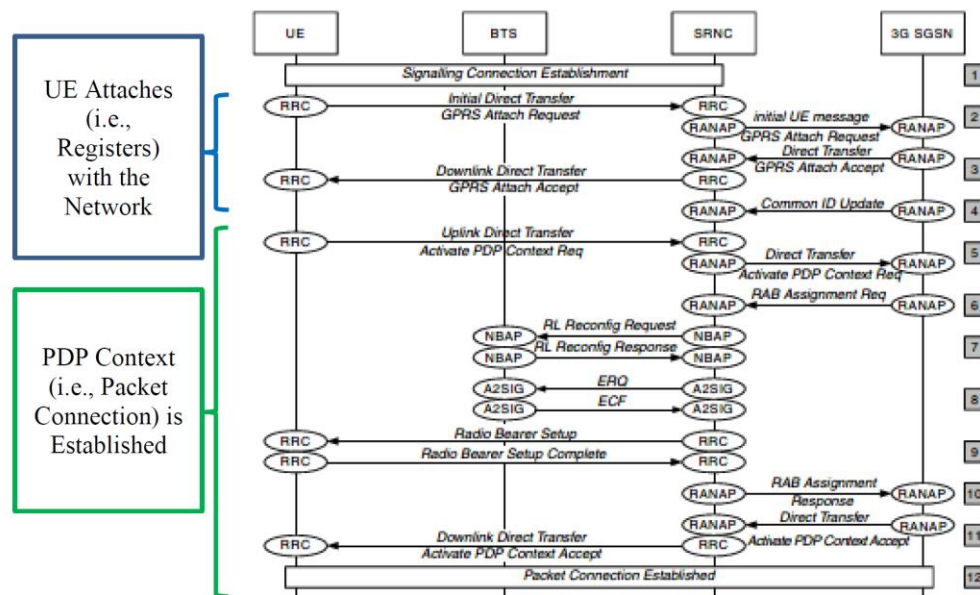


Figure 6.138 Packet connection establishment

Id. (citing Ex. 1016, 413).

118. Similarly, in the CS domain of the mobile network, a mobile station (“MS”) can (be) call(ed) or utilize network services only if it has registered with

(attached to) the mobile network. An example of this is provided below in reference to performing an outgoing call in the CS domain of a GSM network:

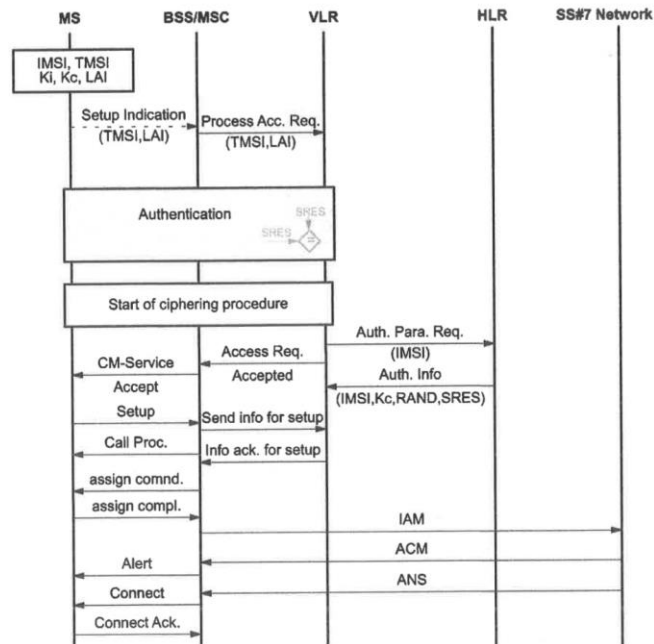


Figure 6.8 Overview of an outgoing call setup.

Before the “Setup indication” message for initiating the establishment of a CS call can be sent, the MS needs to first register with the network. Ex. 1008-2, 200 (“The establishment of a connection always contains **a verification of user identity (authentication)** independent of whether it is a mobile-originated call setup or a mobile-terminated call setup. The authentication is performed in the same way as for location updating.”). Once the call session is established, data (e.g., M2M measurement data) can then be transmitted over the call connection. Thus, in the embodiments of Figures 2A and 3A the detach request transmitted after receiving the delivery report detaches the communication module from the cellular network,

meaning no CS or PS connection for data transmission is present or established.

119. Figures 2B and 3B are directed to embodiments that take a different but simpler approach. Instead of attaching and then detaching the UE from the network (as in Figs. 2A and 3A), the UE simply rejects the attach request (step 4) as shown below.

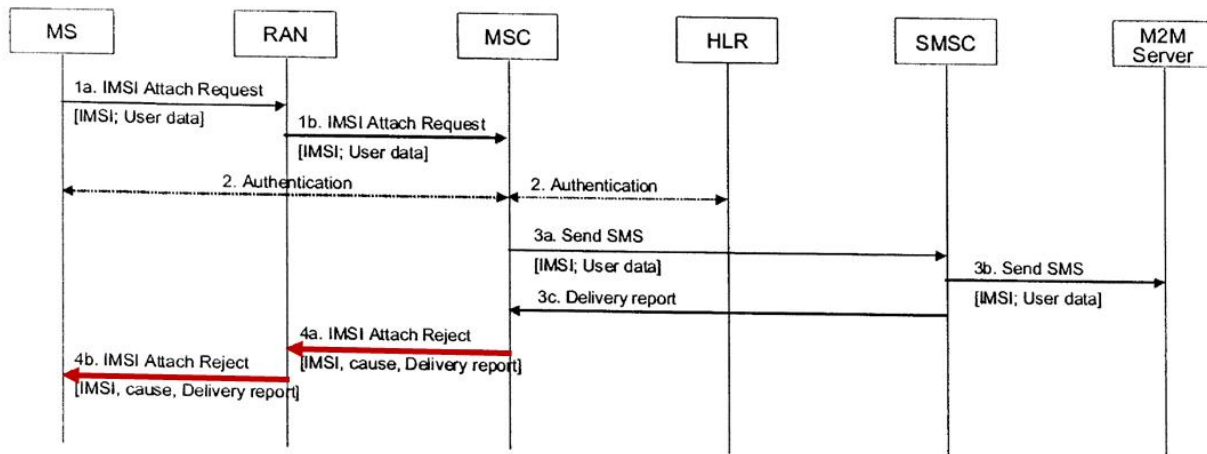


FIG. 2B

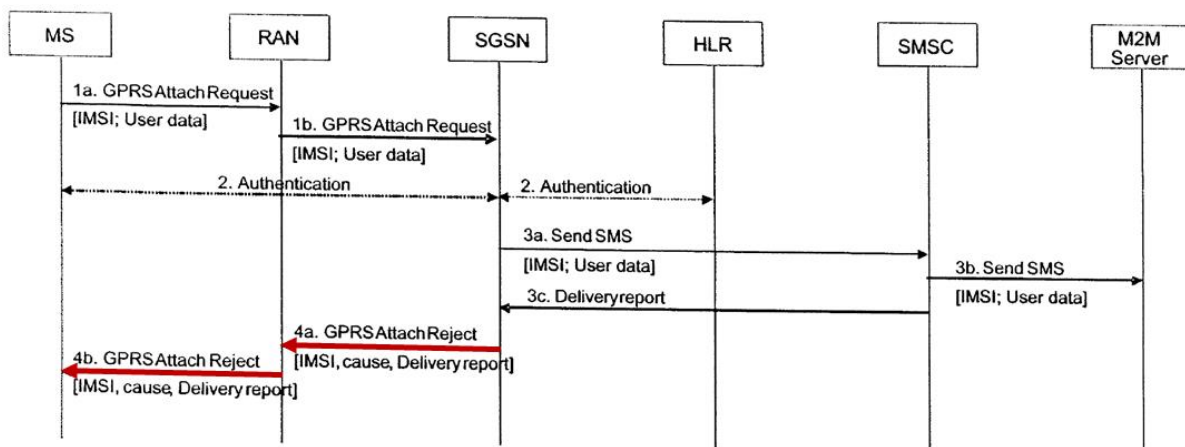


FIG. 3B

Ex. 1001, 7:9-17, 7:36-45 (discussing Fig. 2B), 8:46-54, 9:6-14 (discussing Fig. 3B). Because the UE attach request was rejected, the UE does not register with the network. As discussed in previous paragraphs, a UE must register with the network in the CS or PS domain to establish a complete CS or PS connection, which means that the attach reject precludes such a connection from being established, and therefore no CS or PS connection is established. *See* Ex. 1001, 3:3-6 (“the attach request message from the communication module is rejected by the network, thereby ***excluding that a circuit switched or a packet switched connection can be established.***”).

120. A POSITA would understand these embodiments provide examples of “avoiding to establish a complete circuit-switched or packet-switched connection between said communication [module/apparatus/device] and said telecommunications network.” *See* Ex. 2005, 4 (defining “avoid” to mean “to keep away from; evade; shun”), 6 (defining “establish” to mean “to cause to be or happen; bring about”); Ex. 2006, 3 (defining “avoid” to mean “refrain or keep away from” or “escape; evade”); Ex. 2007, 4 (defining “avoid” to mean “to keep away from; shun”). Despite this, the embedded application data (e.g., M2M measurement data) is successfully transmitted to the M2M server as part of the attach request (the signalling message), while preserving network resources.

121. I understand that Petitioner argues that Krco avoids establishing a complete CS or PS connection, because registration of the UE 10 “does not **result in** a ‘*complete circuit-switched connection or packet-switched connection*’ between the UE and the telecommunications network, and that establishing such a connection “**requires a separate procedure** for establishing a communication session.” Petition, 46-47. As explained below, Petitioner is mistaken.

122. Unlike the claimed invention, Krco does not teach, suggest, or otherwise imply avoiding establishing a complete CS or PS connection. Instead, the UE of Krco initiates the “registration procedure,” which a POSITA would understand is a required step for establishing a complete PS or CS connection. Ex. 1009, 4:24-40.

123. A POSITA would know that if a UE wishes to use the services of a mobile network, as a mandatory first step it must attach to the network. After the UE is attached to the network (registered), the next logical step is to establish a communication session and start utilizing the services that the network can offer. *See, e.g.*, Ex. 1008-2, 192 (“Before a MS can be called or gain access to services, the subscriber has to register with the mobile network (PLMN)”), 245 (“Before a MS can use GPRS services, it must attach to the network (similar to the IMSI attach used for circuit-switched GSM services”). For example, Figure 6.138 of Exhibit

1016 is entitled “Packet connection establishment” and shows the UE attach procedure as part of the procedure for establishing a PDP Context. Petition, 48 (citing Ex. 1016, 413).

124. Consequently, Krco teaches the first step in establishing a CS or PS connection, without any teaching or suggestion that such a connection (the next logical step) is ultimately avoided. A POSITA would not understand taking the first step toward establishing a complete PS or CS connection as amounting to “avoiding” the establishment of a complete CS or PS connection. A POSITA would recognize that Krco does not teach, for example, rejecting the registration request or detaching from the network, either of which would avoid the establishment of a CS or PS connection. Krco is simply silent on what occurs after the UE registers.

125. A POSITA would also understand that the next logical step after Krco’s UE 10 attaches to the network (registers) is to establish a communication session and start using the services that the network can offer to transmit data. While the central focus of Krco is transmitting “secondary data” (i.e., information about the properties of the newly connected second network/entities) in a wireless signalling message, a POSITA would understand that the M2M measurement data of Krco would be transmitted using a conventional CS or PS connection.

126. Krco explains that “UEs in today’s networks are considered as devices that end users use to access services that the network provides. Such services are voice calls, SMS and MMS and in the high speed 3G networks also services that relates to data access, for instance to email and internet.” Ex. 1009, 1:24-28. Krco further teaches that “[t]he main purpose of the UE is to provide information or data *collected by* the second network 15 or entity 16 to the service provider 17” (*id.* at 3:64-67) and that “various types of **sensors** will use short range wireless communication (such as Bluetooth) *to communicate via a UE to the rest of the world*” (*id.* at 1:53-58). Furthermore, Krco’s claims distinguish (1) “M2M data *collected by*” M2M type entities that is forwarded “via the cellular network” from (2) the “M2M properties” of the M2M type entities (the “secondary data”) that is transmitted as part of a signalling message. A POSITA would thus understand that while the UE of Krco transmits M2M signalling data (“secondary data”) using the UE’s signalling message (e.g., Location Update Request), the UE is also transmitting M2M data collected by the second entity/network (e.g., sensor measurements) via another established communication path over the cellular network. Consequently, for a POSITA the natural and logical next step following the UE registration request in the cellular network would be for the UE to establish a CS or PS communication session for transmitting the M2M measurement data.

127. A POSITA would not understand Krco to disclose the “avoiding” limitation simply because it is silent on what occurs after the registration process for the UE begins. Instead, as explained above, a POSITA would *expect* a complete CS or PS connection to be established so that data other than the “secondary data” can be transmitted as well.

128. Petitioner mistakenly represents that registering the UE “does not result in” a complete CS or PS connection. But as I explained above, establishing a complete CS or PS connection necessarily requires first initiating the registration process. That means that any complete CS or PS connection is a result of the registration process. It appears then that Petitioner’s statement is premised on the mistaken assumption that Krco's UE does not establish a complete CS or PS connection after the registration. However, nothing in Krco supports the assumption that after the registration procedure is triggered, no CS or PS connection is established.

129. I understand that Petitioner also asserts that Krco discloses the “avoiding” limitation because “[e]stablishing a complete circuit-switched or packet-switched connection requires a separate procedure [from the registering procedure] for establishing a communication session,” and Krco only discloses the use of an attach/registration request message and “not a session establishment request

message.” Petition, 49. As I discussed above, the registration procedure is the first (and required) step in establishing such a session, and nothing in Krco teaches or suggests that the UE avoids this “separate procedure” after registering.

130. A POSITA would understand Petitioner’s position that Krco satisfies the “avoiding limitation” to be at odds with the disclosures of Krco. While the primary focus of Krco is on the transmission of M2M signalling information (i.e., “secondary data”) in a signalling message, Krco is clear that the UE is transmitting other data as well. A POSITA would naturally expect a CS or PS connection to be established after the network registration procedure is initiated so that the collected M2M data can be transmitted to the M2M provider. As but one example, a POSITA would expect Krco to establish a PDP Context, which would allow the M2M measurement data to be transmitted over the internet as expressly taught by Krco at column 1, lines 24 to 28.

131. For these reasons, a POSITA would not understand Krco to teach or suggest the “avoiding” limitation. Krco is simply silent on what occurs after the network registration is initiated, which necessarily means it does not disclose the “avoiding” limitation.

VIII. CONCLUSION

132. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code. I further declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: June 16, 2023



Radostin Pachamanov, Ph.D.