

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GOOGLE LLC,

Petitioner,

v.

HEADWATER RESEARCH LLC,

Patent Owner.

Patent No. 10,237,757  
Case No. IPR2026-00048

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**DECLARATION OF DR. HARRY BIMS**

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**LIST OF EXHIBITS**

| <b><u>Exhibit</u></b> | <b><u>Description</u></b>                                                                          |
|-----------------------|----------------------------------------------------------------------------------------------------|
| EX1001                | U.S. Patent No. 10,237,757 B2 to Raleigh et al. (“the ’757 patent”)                                |
| EX1002                | Patent Center Prosecution History of U.S. Patent No. 10,237,757 B2                                 |
| EX1003                | Reserved.                                                                                          |
| EX1004                | Curriculum Vitae of Harry Bims, Ph.D.                                                              |
| EX1005                | U.S. Patent App. Pub. No. US 2009/0028082 A1 to Wynn et al. (“ <i>Wynn</i> ”)                      |
| EX1006                | U.S. Patent App. Pub. No. US 2010/0048172 A1 to Karaoguz (“ <i>Karaoguz</i> ”)                     |
| EX1007                | File History of U.S. Provisional App. No. 61/091,523 to Karaoguz (“ <i>Karaoguz Provisional</i> ”) |
| EX1008                | U.S. Patent App. Pub. No. US 2003/0003933 A1 to Deshpande et al. (“ <i>Deshpande</i> ”)            |
| EX1009                | U.S. Patent App. Pub. No. US 2008/0186240 A1 to Man et al. (“ <i>Man</i> ”)                        |
| EX1010                | U.S. Patent App. Pub. No. US 2005/0043026 A1 to Brok et al. (“ <i>Brok</i> ”)                      |
| EX1011                | International Publ. No. WO 2009/029157 A1 to Vardi et al. (“ <i>Vardi</i> ”)                       |
| EX1012                | U.S. Patent App. Pub. No. US 2010/0110921 A1 to Famolari et al. (“ <i>Famolari ’921</i> ”)         |
| EX1013                | U.S. Patent App. Pub. No. US 2010/0083121 A1 to Famolari et al. (“ <i>Famolari ’121</i> ”)         |
| EX1014                | U.S. Patent App. Pub. No. US 2007/0111740 A1 to Wandel (“ <i>Wandel</i> ”)                         |

| <b><u>Exhibit</u></b> | <b><u>Description</u></b>                                                                                                                                                                                                                                                                                                                                                             |
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| EX1015                | Kevin Lai & Mary Baker, <i>Measuring Bandwidth</i> , IEEE INFOCOM '99. CONFERENCE ON COMPUTER COMMUNICATIONS. PROCEEDINGS. EIGHTEENTH ANNUAL JOINT CONFERENCE OF THE IEEE COMPUTER AND COMMUNICATIONS SOCIETIES. THE FUTURE IS NOW (CAT. No.99CH36320), pp. 235-245 (1999)<br>[ <a href="https://doi.org/10.1109/INFCOM.1999.749288">https://doi.org/10.1109/INFCOM.1999.749288</a> ] |
| EX1016                | Press Release, <i>A History of Mobile Phones and Smartphones</i> , BBC BITESIZE (Feb. 2024),<br><a href="https://www.bbc.co.uk/bitesize/articles/z62gjfr">https://www.bbc.co.uk/bitesize/articles/z62gjfr</a>                                                                                                                                                                         |
| EX1017                | <i>Apple Introduces the New iPhone 3G</i> , APPLE (June 9, 2008),<br><a href="https://www.apple.com/newsroom/2008/06/09Apple-Introduces-the-New-iPhone-3G/">https://www.apple.com/newsroom/2008/06/09Apple-Introduces-the-New-iPhone-3G/</a>                                                                                                                                          |
| EX1018                | M. Buddhikot et al., <i>Integration of 802.11 and Third-Generation Wireless Data Networks</i> , IEEE INFOCOM 2003, TWENTY-SECOND ANNUAL JOINT CONFERENCE OF THE IEEE COMPUTER AND COMMUNICATIONS SOCIETIES (IEEE CAT. No.03CH37428), pp. 503-512 (2003)<br>[ <a href="https://doi.org/10.1109/INFCOM.2003.1208701">https://doi.org/10.1109/INFCOM.2003.1208701</a> ]                  |

I, Harry Bims, Ph.D., declare as follows:

## **I. INTRODUCTION**

1. I have been asked to submit this declaration on behalf of Google LLC (“Petitioner”) in connection with a petition for *inter partes* review of U.S. Patent No. 10,237,757 (“the ’757 patent”). I have been told that the petition is being submitted to the Patent Trial and Appeal Board of the United States Patent and Trademark Office (“USPTO”) by the Petitioner.

2. Specifically, I have been retained as a technical expert by the Petitioner to study and provide my opinions on the technology claimed in, and the patentability or unpatentability of, claims 1-10 of the ’757 patent (“the Challenged Claims”). For purposes of this declaration, I was not asked to provide any opinions that are not expressed herein.

## **II. SUMMARY OF OPINIONS**

3. This declaration is directed to the Challenged Claims of the ’757 patent and sets forth the opinions I have formed, the conclusions I have reached, and the bases for each.

4. In forming my opinions, counsel for Petitioner told me to assume that the effective filing date of the ’757 patent is January 28, 2009.

5. Based on my experience, knowledge of the art as of the earliest possible effective filing date of the ’757 patent, analysis of prior-art references, and

the understanding of the claim terms in view of the specification that a person of ordinary skill in the art would have as of the effective filing date, it is my opinion that the Challenged Claims of the '757 patent are unpatentable as obvious over the prior-art references discussed below.

### **III. BACKGROUND AND QUALIFICATIONS**

#### **A. Background**

6. My educational background, career history, publications, and other relevant qualifications provided here are only a summary. My full curriculum vitae is enclosed with this declaration as Exhibit 1004.

7. Based on my education, research, and work experience, I am knowledgeable about the subject matter of the '757 patent and the related prior art.

8. I have worked extensively in the field of digital communications. I have studied telecommunications and systems engineering since approximately 1981. Further, I have over 30 years of industry experience in computer network design, including the design of hardware and software for computer communications in a wireless context. During this period, I have designed and implemented various products involving cellular communication technology.

9. I received a B.S. in Computer and Systems Engineering from Rensselaer Polytechnic Institute in 1985. In 1988, I received an M.S. in Electrical Engineering from Stanford University. In 1993, I received a Ph.D. in Electrical

Engineering, also from Stanford University. As a graduate student at Stanford University, I studied the principles of digital communications theory, including data modulation and demodulation, error checking and correction algorithms, and the architecture and design of semiconductor circuits used for digital communications. My Ph.D. thesis at Stanford addressed the application of trellis coding and precoding to a digital modulation system, and was titled “Trellis Coding for Multi-Level, Partial Response Continuous Phase Modulation with Precoding.”

10. After receiving my Ph.D. in 1993, I worked for Glenayre Technologies - Wireless Access Group, where I focused on hardware and software architecture and design, including inventing, designing, and building a patented computer system for real-time testing of two-way pagers and co-developing a wireless application protocol that included a CRC error-checking algorithm. From 1999 to 2001, I was the Director of Engineering for Symmetry Communications, where I was responsible for managing the software development for 2.5G network equipment (the precursor to 4G network equipment) that handles communications to and from personal cellular telephones. The equipment products we developed (a “Serving GPRS Support Node” (or “SGSN”) and “Gateway GPRS Support Node” or (“GGSN”)) routed and managed cellular phone communications by relaying packets of voice, data, and video between the base station tower and the Internet,

regulating the network bandwidth allocated to different classes of cellular phone applications, and transferring control of cellular phone communications from one base station to the next as cellular phones move throughout a geographic area. I also held management responsibility for the Firmware, Hardware, Performance, and Systems Engineering Groups.

11. In January 1999, I launched a technology consulting company, Protocomm Systems Inc., which focuses on the development of advanced wireless communications protocols and related software implementations for wireless product companies.

12. From 1999 to 2001, I was also the Director of Software Architecture for Symmetry Communications System. In this position, I was responsible for the software architecture for core SGSN (Serving GPRS Support Node) and GGSN (Gateway GPRS Support Node) products for the GPRS (Generic Packet Radio Services) market. I also held management responsibility for the Firmware, Hardware, Performance, and Systems Engineering Groups.

13. In 2001, I developed a business plan for building network infrastructure for 802.11 enterprise networks, and then later that year founded AirFlow Networks, Inc., where I invented and received over eleven patents on its core technology, which was based on the 802.11 wireless local area network specification.

14. I have been a member of the Institute of Electrical and Electronics Engineers (“IEEE”) for more than 28 years. The IEEE is an international organization of more than 400,000 engineers, and is the world’s largest technical professional society, with locations in more than 160 countries. I am currently a Senior Member of the IEEE, and serve in a variety of leadership roles, including as a reviewer and voter on draft amendments to technical standards such as 802.11 (Wi-Fi), and 802.3 (Ethernet) prior to publication by their 802 Committee. The IEEE 802 Committee is the standards development organization responsible for publishing protocol standards for Ethernet, Wi-Fi, and a variety of other wired and wireless protocols that are in commercial use globally.

15. I am currently an expert consultant for Protocomm Systems, LLC, and Bims Laboratories, LLC, both of which I founded. I perform technical research in wireless technology standards, such as UMTS, LTE/4G, 5G, Wi-Fi, Bluetooth, and other network communication protocols. I am named as an inventor of twenty-three telecommunications-related patents. One of those patents is U.S. Patent No. 8,935,580 (“the ’580 patent”), which issued January 13, 2015, and is currently assigned to Apple Inc. The application for the ’580 patent was filed with the USPTO on June 18, 2013, with priority to an earlier application filing date of July 2, 2008, which became U.S. Patent No. 8,468,426. The ’580 patent, titled “Multimedia-Aware Quality-of-Service and Error Correction Provisioning,”

discloses a method of encoding a stream of data packets in which the packets are routed to separate “QoS processing modules,” each possessing their own QoS profile, where the packets are processed according to multiple factors, such as priority, traffic rate, latency, tolerated jitter, transmitter scheduling, media type, etc. Subsequent to this processing, the packets are combined and transmitted.

16. Another of those patents is U.S. Patent No. 7,236,470 (“the ’470 patent”), which issued June 26, 2007, and is currently assigned to Broadcom Corporation. The application for the ’470 patent was filed with the USPTO on September 15, 2003, with priority to an earlier application filing date of January 11, 2002, which became U.S. Patent No. 6,788,658. The ’470 patent, titled “Tracking Multiple Interface Connections by Mobile Stations,” discloses a method and apparatus wherein a network switch determines a mobile station connected over one interface, such as an 802.11 wireless interface, and is subsequently attempting to separately connect to the network switch over a wired interface, such as a wired Ethernet cable interface. The network switch may then enforce a security policy that may deny either or both network connections.

17. The services I provide include consulting in telecommunication standards setting, protocol simulation and implementation, technology assessments, engineering lab testing, and product analysis. Through Bims Laboratories, I have participated in technical discussions for several years in the

IEEE 802 Committee to develop new technology that allows LTE and 5G networks to coordinate their network activities with Wi-Fi networks.

18. I have also served in several leadership capacities with the IEEE 802.16 Working Group (2009-present) and the IEEE 802.15 Working Group where I currently serve as technical editor for a wide-area cellular standard that is a competitor to LTE and 5G, and I am currently a voting member in the IEEE 802.11 Working Group. Within the IEEE 802.15 Working Group, I am the technical editor for IEEE 802.16t, an amendment to the WiMAX standard that supports long-range wireless networks for the railroad industry. Furthermore, since 2003, I have served as a wireless technology expert in patent infringement cases. I am actively involved in liaison conversations regarding the interoperation of IEEE 802.11-based wireless networks and 3GPP networks, including 3G, LTE, and 5G networks.

19. I am an author of nine technical publications and a named inventor of twenty-three telecommunications-related patents, including U.S. Patent No. 8,995,996, which describes how wireless devices that interfere with each other can coordinate their communications in an optimal manner. The entire list of those patents and publications can be found in my full CV.

20. I have been active in professional engineering associations and research bodies. From 1985 to 1991, I was the AT&T Bell Labs Cooperative Research Fellow. In 2000, I served as a Chair of the IEEE Engineering Management Society, Silicon Valley Chapter. From 2007 to 2010, I served as a vice chair and secretary of the IEEE 802.16h License-Exempt Task Group and have been a senior member of IEEE since 2012.

**B. Compensation**

21. I am being compensated for services provided in this matter at \$850 per hour. My compensation is not conditioned on the conclusions I reach as a result of my analysis or on the outcome of this matter, and in no way affects the substance of my statements in this declaration.

22. I do not have any financial interest in Petitioner or its subsidiaries. I also do not have any financial interest in Patent Owner, Headwater Research LLC. Further, I do not have any financial interest in the '757 patent, and I have not had any contact with the named inventors of the '757 patent: Gregory Raleigh, Alireza Raissinia, and James Lavine.

**IV. MATERIALS CONSIDERED**

23. In forming my opinions, I read and considered the '757 patent and its prosecution history, the other exhibits listed in the Exhibit List at the beginning of this declaration, and any other materials referenced herein.

## **V. LEGAL STANDARDS**

24. In forming my opinions and considering the subject matter of the '757 patent and its claims in light of the prior art, I am relying on certain legal principles that counsel in this case explained to me. My understanding of these concepts is summarized below.

25. I understand that the claims define the invention. I also understand that an unpatentability analysis is a two-step process. First, the claims of the patent are construed to determine their meaning and scope. Second, after the claims are construed, the content of the prior art is compared to the construed claims.

26. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, I have been informed that the prior art can “anticipate” a claim. Second, I have been informed that the prior art can render a claim “obvious” to a person of ordinary skill in the art. I understand that a claim is patentable if it was not anticipated and would not have been obvious by the prior art at the effective filing date of the patent.

### **A. Claim Construction**

27. I understand that the United States Patent and Trademark Office interprets claim terms in an *inter partes* review proceeding under the same claim construction standard that is used in a United States federal court. I understand that

under this standard, the meaning of claim terms is considered from the viewpoint of one of ordinary skill in the art at the time of the alleged invention.

28. I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claim terms are generally not limited by the embodiments described in the specification.

29. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

**B. Obviousness Under 35 U.S.C. § 103**

30. I understand that a patent claim is invalid as obvious if the claimed invention would have been obvious to a person of ordinary skill in the art at the time the claimed invention was made. This means that even if all of the elements of the claim cannot be found in a single prior-art reference that would anticipate the claim, a person of ordinary skill in the field who knew about all the prior art would have come up with the claimed invention. I understand that in an obviousness determination, the person of ordinary skill in the art is presumed to

have knowledge of all prior art. I understand that whether a claim is obvious is based upon the determination of several factual issues.

31. I have been informed that, in an obviousness analysis, prior art must be analogous to the patent being considered. I have been informed that a prior-art reference is considered to be analogous, or in the same field of art, if the reference is either (1) in the same field of endeavor as the challenged patent, regardless of the problems the challenged patent and the prior art address; or (2) reasonably pertinent to the particular problem being solved by the challenged patent.

32. In considering obviousness, I understand that one must determine the scope and content of the prior art. I also understand that one must determine what differences, if any, existed between the claimed invention and the prior art.

33. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. In evaluating whether such a claim would have been obvious, one may consider whether a reason has been identified that would have prompted a person of ordinary skill in the art to combine the elements or concepts from the prior art in the same way as in the claimed invention. There is no single way to define the line between true inventiveness on the one hand (which is patentable) and the application of common sense and ordinary skill to solve a problem on the other hand (which is not patentable). For example, market forces or

other design incentives may be what produced a change, rather than true inventiveness.

34. I also understand that, while there is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, and while a suggestion to combine known elements to achieve the claimed invention may come from the prior art as a whole or individually and may consider the inferences and creative steps a person of ordinary skill in the art would employ, as filtered through the knowledge of one skilled in the art, obviousness grounds cannot be sustained by mere conclusory statements and must include some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. Moreover, I understand that a proper obviousness analysis requires a determination of whether a person of ordinary skill in the art would have a “reasonable expectation of success”—but not “absolute predictability” of success—in achieving the claimed invention by combining prior-art references.

35. I understand that one may consider whether (1) the change was merely the predictable result of using prior-art elements according to their known functions, or whether it was the result of true inventiveness; (2) there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; (3) the innovation applies a known technique that

had been used to improve a similar device or method in a similar way; (4) the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art; (5) the invention merely substituted one known element for another known element in order to obtain predictable results; (6) the invention merely applies a known technique to a known device, method, or product to yield predictable results; or (7) known work in the field may have prompted variations of use of the same inventions in the same or different fields due to market forces or design incentives that would have been predictable to a person of ordinary skill in the art.

36. I understand that one must be careful not to determine obviousness using the benefit of hindsight; many true inventions might seem obvious after the fact. I understand that the determination should be based on the position of a person of ordinary skill in the field at the time the claimed invention was made and should not consider what is known today or what is learned from the teaching of the patent.

**C. Secondary Considerations of Nonobviousness**

37. I understand that certain secondary considerations may be considered in evaluating obviousness in order to prevent hindsight bias. These secondary considerations include commercial success of products that practice the patent,

long-felt need for the patented technology, failure by others to solve the problem addressed by the patent, initial skepticism by others in the industry, industry recognition and praise of the patented products, and efforts by others to copy the patented technology. I am not presently aware of any secondary considerations that would apply here.

38. I have been informed that these secondary considerations of nonobviousness must be balanced against the strength of the prima facie case of obviousness. Where the invention represents no more than the predictable use of prior-art elements according to their established functions, secondary considerations are inadequate to establish nonobviousness.

39. I have also been informed that the patentee must establish a nexus between any secondary-consideration factors and the claimed invention. Where a secondary-consideration factor results from something other than what is both claimed and novel in the patent, there is no nexus to the merits of the claimed invention.

40. I have been informed that, for example, the nexus requirement as it applies to the evidence of commercial success requires that the patentee must show that the sales of a product that allegedly practices the claimed invention must be a direct result of the unique characteristics of the claimed invention, as opposed to other economic and commercial factors that are unrelated to the patented

invention. I understand that this means if the commercial success is due to an element that existed in the prior art or that is not claimed by the patent, then no nexus exists.

41. I have been further informed that, for example, the nexus requirement as it applies to the long-felt need element must likewise be supported by evidence. Where the differences between the prior art and the claimed invention are minimal, it cannot be said that any long-felt need was met by the patented invention or that the patent solved any technological problems that were unaddressed by others.

42. I have been informed that evidence of industry praise must also show a nexus with the claimed invention, and that self-serving statements by the patentee regarding the merits of the claimed invention are generally not given weight.

## **VI. PERSON OF ORDINARY SKILL IN THE ART**

43. I am informed that patentability must be analyzed from the perspective of “one of ordinary skill in the art” (a “POSITA”) in the same field as the patent-in-suit at the time of the invention. I am also informed that several factors are considered in assessing the level of ordinary skill in the art, including (1) the types of problems encountered in the art; (2) the prior-art solutions to those problems; (3) the rapidity with which innovations are made; (4) the sophistication of the technology; and (5) the education level of active workers in the field.

44. In my opinion, a person of ordinary skill in the art pertinent to the '757 patent as of its earliest possible priority date would have had at least a bachelor's degree in computer science, electrical engineering, or a similar field, and approximately two years of industry or academic experience in a field related to mobile-device telecommunications. More related education would compensate for fewer years of work experience (and vice versa). I meet this definition of one of ordinary skill in the art now and did so as of the earliest possible priority date of the '757 patent.

## **VII. TECHNOLOGY BACKGROUND**

### **A. Mobile Communication Devices and Related Networks**

45. The introduction of smartphones in the 1990s and early 2000s revolutionized cellular communications, allowing users to stay connected via voice calls, messaging, and e-mail regardless of their location. EX1016,<sup>1</sup> 4-5. However, these capabilities brought about unique challenges when deployed across different

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<sup>1</sup> Citations to exhibit page numbers herein refer to the marked page number of the exhibit (and the page number of the corresponding PDF file) and do not necessarily correspond to the document's original page numbering.

network technologies, such as cellular and Wi-Fi<sup>2</sup> (e.g., IEEE 802.11) networks.

These technologies were eventually integrated in smartphones that allowed users to “seamlessly switch” between wireless networks as needed by transferring user data using any available cellular or Wi-Fi network. EX1018, 1.

46. By January 2009, the ’757 patent’s earliest possible priority date, skilled artisans had already developed systems and methods for determining wireless offloading priorities for cellular subscribers and facilitating the selection of and connection to wireless networks based on those offloading priorities. For example, smartphones such as the iPhone 3G (launched in 2008) had already begun implementing automatic switching between networks (e.g., Wi-Fi, 3G, EDGE) to ensure optimal network performance. EX1017, 1. Prior-art references, such as *Wynn*, further disclosed selecting a preferred wireless network from a list of available wireless networks (e.g., CDMA, GSM, 3G, EVDO, WiFi, WiMAX, and LTE) based on performance metrics (e.g., bandwidth, latency) associated with each network and switching to a preferred available wireless network. EX1005, ¶¶125-128.

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<sup>2</sup> I use the terms “Wi-Fi” and “WiFi” interchangeably in this declaration.

**B. Characterizing Network Performance Using an “Upload and/or Download Sequence”**

47. Methods of assessing the performance of a network by analyzing the data-transfer rate over the network have been known in the fields of wired and wireless telecommunications for several decades, as described by numerous documents not considered by the Examiner during prosecution. For example, an IEEE publication titled “Measuring Bandwidth” from 1999 states that “accurate and timely bandwidth measurement is useful for mobile computing.” EX1015, 1. The publication further states that the “most popular technique” for measuring bandwidth is “to use throughput as an approximation of bandwidth,” where “[t]hroughput is the amount of data a transport protocol like TCP can transfer per unit of time.” EX1015, 2. Data packets may be transferred, e.g., through an “outbound link” (e.g., data upload) or an “inbound link” (e.g., data download). EX1015, 7.

48. Many prior-art systems and methods conduct such network evaluations, as evidenced at least by *Deshpande, Brok, Vardi, Famolari '921*, and *Famolari '121*, which each demonstrate the prevalence of these methods by the early 2000s, including in the context of mobile-device communications over wireless networks.

49. *Deshpande*, published in 2003, states that “[m]ethods for measuring the bandwidth of wireless connections are known.” EX1008, ¶15. *Deshpande* describes a “mobile client 38” on a “communication device 10” (e.g., a cellular phone or PDA) that “requests a short (e.g., 5 seconds) temporary network connection from each [wireless-network] provider during which the bandwidth of the connection can be directly measured.” EX1008, ¶¶9, 15. In my opinion, a POSITA would have understood that *Deshpande*’s description of establishing a temporary network connection over which the “bandwidth of the connection can be directly measured” includes doing so by transmitting data over the established network connection, such as through an “upload and/or download sequence.”

50. Similarly, *Brok*, which published in 2005 and describes communication-system algorithms for connecting mobile clients to available communication systems, describes mapping measurements such as a signal-to-interference ratio to a maximum allowable data-transfer rate to characterize the performance of a network. EX1010, ¶¶5-10, 46, 50-52. *Brok* describes taking “[d]irect performance measurements” of available networks based on metrics such as the network’s “data bit rate.” EX1010, ¶46. The data bit rate is measured “using short ‘probe’ sessions,” which “can be performed sequentially.” EX1010, ¶46. In my opinion, a POSITA would have understood that *Brok*’s sequential “probe

sessions” to evaluate a network’s “data bit rate” would require conducting at least one of a data-upload or data-download sequence in connection with that testing.

51. *Vardi*, filed in 2008, also discusses the use of upload and/or download sequences to characterize the performance of network connections. *Vardi*’s client devices collect radio-resource information about access points (and networks), including connection bandwidth by, for example, conducting radio-resource surveys. EX1011, 6, 17. The radio resource surveys can be achieved by “measurement trips,” where the client device associates with an access point other than the one used for a current network connection and “conduct[s] data acquisition.” EX1011, 6, 17. In my opinion, a POSITA would have understood that *Vardi*’s description of conducting “data acquisition” by a mobile device as part of a “measurement trip[]” would at least include a download sequence of the data being acquired by the mobile device.

52. *Famolari ’921* and *Famolari ’121*, which each claim priority to provisional applications filed in 2008, describe upload and/or download sequences in the context of characterizing network performance. Both references pertain to a pre-evaluation procedure for multiple network access points that may be prioritized by an access point and includes evaluating bit rates and “[n]etwork-level attributes” such as Internet connectivity. EX1012, Abstract, ¶¶24, 47; EX1013, Abstract, ¶¶20-25. In evaluating network performance, ICMP ping messages and

HTTP request and response messages (e.g., upload and/or download sequences) are sent between a user client device and an access point or other network element to determine throughput and delay characteristics of the network prior to establishing a data-communication session. EX1012, ¶¶105-111; EX1013, ¶39 (“IP path performance includes, e.g., the speed, roundtrip times, and/or other relevant information that **describe the exchange of packets** using that particular IP interface.”).<sup>3</sup>

## VIII. THE '757 PATENT

53. The '757 patent was filed December 5, 2016, and claims priority to January 28, 2009. EX1001, pp. 1-2 (field codes (22), (60)).

### A. Overview

54. The '757 patent discloses techniques for wireless offloading that use network data to determine wireless-offloading priorities for cellular subscribers. EX1001, 2:8-31, 6:25-40, 25:24-58.

55. Figure 2, annotated below, depicts “an example of a system 200 for providing a prioritized network list to stations on a wireless network.” *See*

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<sup>3</sup> All emphases in quotations, colored text, and colored annotations in figures have been added unless otherwise noted.

EX1001, 8:6-11:46, Fig. 2. The system includes “**stations**” (STA) **214-1 through 214-N**, which can be “**wireless devices**.” EX1001, 3:1-38, 8:6-19. The system also includes a “**network 202**,” which is “coupled to” a “point-of-presence (PoP) 204” such as a “PoP on the Internet,” and “can include any applicable network that is capable of coupling the station 214-1 to [a] [communications service provider] CSP 210.” EX1001, 8:6-21. The “CSP 210 includes a **prioritized network list provisioning engine 216**” that “provides a prioritized network list to the **stations 214**.” EX1001, 8:6-17, 10:20-29. The system further includes several **wireless networks 208-1 to 208-N**, which can be, e.g., IEEE 802.11 wireless networks coupled to a **wireless access point (WAP) 212**. EX1001, 8:6-17, 8:35-60.

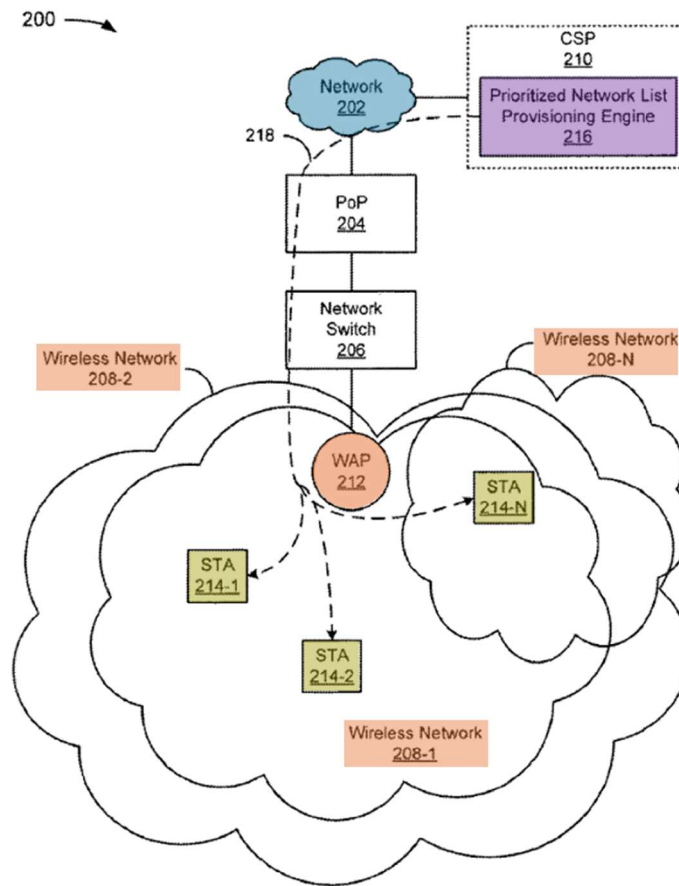


FIG. 2

EX1001, Fig. 2.

56. Figure 11 illustrates other aspects of the purported invention:

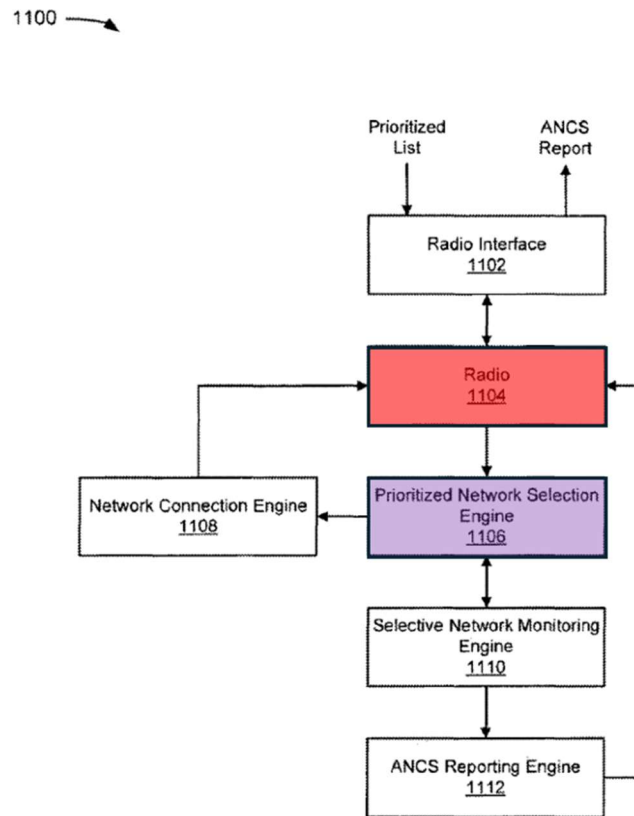


FIG. 11

EX1001, 25:24-58, Fig. 11. The system is implemented on a **device** and includes a radio interface, a **radio**, a **prioritized network selection engine**, a network connection engine, a selective network monitoring engine, and an available network characterization scan (“ANCS”) reporting engine. EX1001, 25:25-30. The **radio** receives a prioritized list from a server, such as the ANCS reporting engine. EX1001, 16:55-67. Using the prioritized list, the **prioritized network selection engine** selects a **priority network**. EX1001, 25:31-37. The selection of the priority network involves connecting the **radio** to a **network element** through an

**alternative network**, conducting an upload and/or download sequence during which the alternative network's performance is monitored, and then characterizing and recording the performance of the alternative network. EX1001, 6:25-36, 25:31-37.

## **B. Prosecution History**

57. During prosecution, the Examiner issued a single Office Action rejecting the claims. EX1002, 655-65. The primary reference cited in the Office Action was U.S. Patent App. Pub. No. 2007/0111740 to Wandel (*“Wandel,”* EX1014). EX1002, 659-65.

58. I understand that the Applicant did not amend the claims in response to the Office Action, instead asserting in response that *Wandel*'s discussion of assigning RF channels according to a strongest cumulative average signal strength after decoding control information fails to teach the claimed “characterizing performance based on a conducted upload and/or download sequence.” EX1002, 780-81. The Applicant further asserted that *Wandel*'s receipt of RF signals is a “passive scanning of RF signals,” and it therefore fails to disclose “caus[ing] [a] wireless end-user device to connect through [a] selected available wireless network to a network element in a second network reachable through the selected available wireless network.” EX1002, 781. The Examiner allowed the application thereafter. EX1002, 798 (finding the claims allowable “in view of the remarks field [sic] on

11/14/2018 concerning the selection of the wireless network based on conducted upload and/or download sequence”).

**C. *Wandel* Discloses Characterizing Network Performance Using an “Upload and/or Download Sequence”**

59. As discussed in Section VIII.B above, during prosecution of the application that issued as the ’757 patent, the Applicant sought to distinguish the *Wandel* prior-art reference by asserting that *Wandel* “fails to teach characterizing performance based on a conducted upload and/or download sequence.” EX1002, 780-81. The Examiner agreed, deeming the Applicant’s arguments on this point persuasive in the Notice of Allowability. EX1002, 798.

60. Contrary to the Examiner’s findings during prosecution, *Wandel* discusses using an “upload and/or download sequence” to characterize an available wireless network. In *Wandel*, at least a download sequence is received by an end-user device (e.g., RF signals are received by a mobile station’s processor over an RF channel). EX1014, ¶49 (“[T]he processor decodes and processes signals on a broadcast control channel (BCCH) associated with the RF channel in order to obtain system control information (step 608 of FIG. 6).”), Fig. 6. *Wandel* states, for example, that after decoding the received control data from the RF channel, “the control information is stored in memory of the mobile station in association with an identification of the RF channel.” EX1014, ¶49. In my opinion, a POSITA

would have known that, to store “control information” in the memory of the device, *Wandel*’s mobile station receives (i.e., downloads) data from the RF channel. *Wandel* further discloses that, after “[u]sing and reading this control information stored in the memory” of the mobile station, the “processor selects one of the wireless communication networks associated with the adequate RF signals based on a predetermined network selection criteria or technique as described earlier in relation to step 408 of FIG. 4.” EX1014, ¶¶40, 51, Fig. 4. In my opinion, a POSITA would have understood that *Wandel* thus discloses both receiving control data from an RF channel (e.g., via a “download sequence”) and then processing that received data to characterize the performance of the network to select which network to connect the mobile station to. EX1014, ¶¶51, 54.

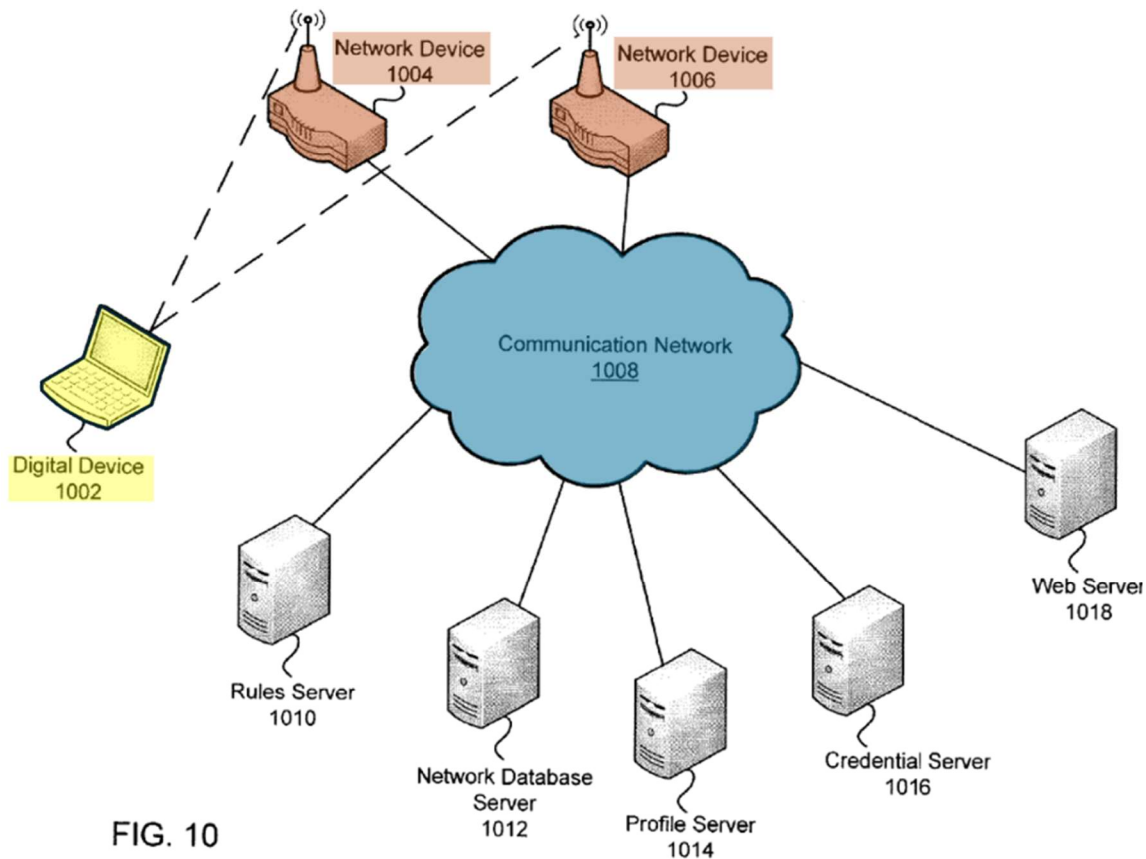
## **IX. CLAIM CONSTRUCTION**

61. In my opinion, for purposes of this declaration, no claim terms require construction. I have therefore applied the ordinary and customary meaning of each claim term as it would be understood by a POSITA in light of the specification and the prosecution history pertaining to the patent.

**X. GROUND 1: CLAIMS 1-6, 9, AND 10 ARE RENDERED OBVIOUS BY WYNN**

**A. Overview of *Wynn***

62. *Wynn* discloses “[s]ystems and methods for wireless network selection based on attributes stored in a network database.” EX1005, Abstract. As shown in Figure 10 below, *Wynn*’s system includes a “**digital device 1002**” that “enters an area located near the **network devices 1004** and **1006**.” EX1005, ¶124, Fig. 10. The “**network devices 1004** and **1006** are separate access points which may each be used to establish communication between the **digital device 1002** and the **communication network 1008**.” EX1005, ¶124. The digital device can “scan the area surrounding the **digital device 1002**, detect the two **network devices 1004** and **1006**, and generate a list of **available wireless networks** with which the **digital device 1002** may establish communication.” EX1005, ¶125.



EX1005, Fig. 10.

63. *Wynn* further discloses a network-selection process for determining the best option out of the available wireless networks through which device 1002 can communicate with communication network 1008. EX1005, ¶¶124, 145, 172. For example, the digital device may transmit information regarding the available wireless networks to a remote server that determines which wireless network the device should connect to (e.g., rules server 1010), or the digital device can make that determination itself. EX1005, ¶¶137-142, 145, 172. The selection may be

based on a variety of “attributes” for each available network, including “a performance metric, a shared indicator, or a service identifier.” EX1005, ¶128.

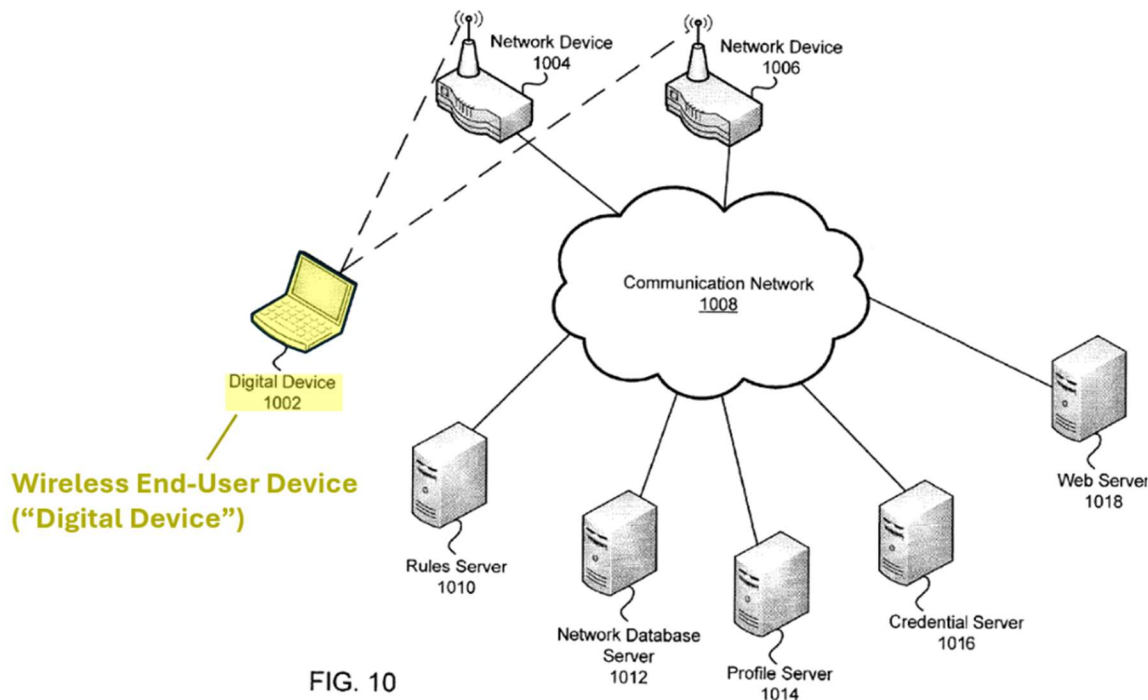
64. *Wynn* is analogous art to the ’757 patent, which, as previously noted, relates to communication network selection on a wireless communication device, including switching (e.g., offloading) the device from a cellular connection to a Wi-Fi network connection. EX1001, Abstract, 2:8-15. *Wynn* is from the same field of endeavor as the claimed invention since, like the ’757 patent, it relates to “[s]ystems and methods for wireless network selection based on attributes stored in a network database.” EX1005, Abstract, ¶21. For example, *Wynn* discloses a mobile communication device (e.g., digital device 1002) that scans for available wireless networks, “performs the analysis to determine the preferred wireless network,” and accesses the selected wireless network. EX1005, ¶¶145, 172.

65. *Wynn*’s disclosure of wireless network selection, which it says “has traditionally been a complex process for users of wireless devices” (EX1005, ¶11), is also reasonably pertinent to the problems faced by the ’757 patent’s inventors, who similarly addressed issues relating to wireless network selection. EX1005, ¶¶3-15 (describing numerous issues known in the art related to wireless network selection). For example, the ’757 patent describes network selection as a “choice [that] is generally made based on user selection, whether or not a better selection is available for a given situation.” EX1001, 1:15-23.

## B. Independent Claim 1

### 1. 1[pre]: “A wireless end-user device comprising:”

66. *Wynn* discloses 1[pre]. For example, *Wynn* discloses a “digital device” that “may comprise a laptop, mobile phone, camera, personal digital assistant, or any other computing device.” EX1005, ¶¶55, 123. Each device is an “end-user” device that can be used by an individual end user (e.g., a cellular phone owner). *Wynn*’s digital device (e.g., **digital device 1002** of annotated Figure 10 below) is also a wireless device that may include, e.g., both cellular network and Wi-Fi network connectivity. EX1005, ¶170, Fig. 10.



EX1005, Fig. 10.

2. **1[a]: “a radio configured to identify available wireless networks, the available wireless networks being different than a current wireless network to which the end user device is currently connected; and”**

67. *Wynn* discloses, or at least renders obvious, 1[a]. For example, *Wynn*’s digital device 1002 includes a “radio configured to identify available wireless networks,” such as a Wi-Fi radio enabling the digital device to communicate through a Wi-Fi network. EX1005, ¶123 (describing “a wireless digital device (e.g., digital device capable of Wi-Fi communication)”). *Wynn*’s digital device additionally includes a cellular radio enabling the digital device to transmit information over a “cellular communication network (e.g., via CDMA, GSM, 3G, or EVDO).” EX1005, ¶126; *see also* EX1005, ¶170 (“In one example, the digital device 1002 generates a list of available Wi-Fi networks and provides the list [to a server] over a cellular network (e.g., EVDO or 3G network).”).

68. In my opinion, a POSITA would have understood that *Wynn*’s digital device 1002 includes a “radio” providing the device’s described network selection and access functionality (e.g., Wi-Fi network functionality including detecting and connecting to available Wi-Fi wireless networks). The use of such radios in mobile communication devices was routine, conventional, and well known in the field of mobile-device telecommunications before the earliest possible priority date of the ’757 patent in January 2009. The ’757 patent concedes as much, describing its

system implementing a “radio interface 402 [that] includes applicable known or convenient technology sufficient to enable a wireless device to use a radio to connect to a wireless network.” EX1001, 14:33-36.

69. To the extent it could arguably be possible to perform the digital device’s Wi-Fi functionality using something other than a radio, a POSITA would at least have found it obvious to implement a radio performing the described network selection and access functionality in *Wynn*’s digital device 1002, since a radio would be the most common and conventional mechanism for providing that functionality in a mobile communication device. In my opinion, a POSITA would have had a reasonable expectation of success in implementing such conventional technology into *Wynn*’s digital device to perform *Wynn*’s described Wi-Fi communication functionality since Wi-Fi radios were ubiquitous well before the ’757 patent’s earliest possible priority date in January 2009. *See, e.g.*, EX1008, ¶¶9-11 (*Deshpande*, published in 2003, describing a Wi-Fi radio (e.g., an “IEEE 802.11(b)” functional mobile device such as a cellular phone) including several radio components, including an “antenna 30” and “a wireless transceiver 32” that “includes radio frequency (RF) transmit and receive functionality”).

70. The Wi-Fi radio of *Wynn*’s digital device 1002—the claimed “radio”—is configured to “identify available wireless networks,” such as by scanning for nearby available wireless networks. *See, e.g.*, EX1005, ¶¶125 (stating

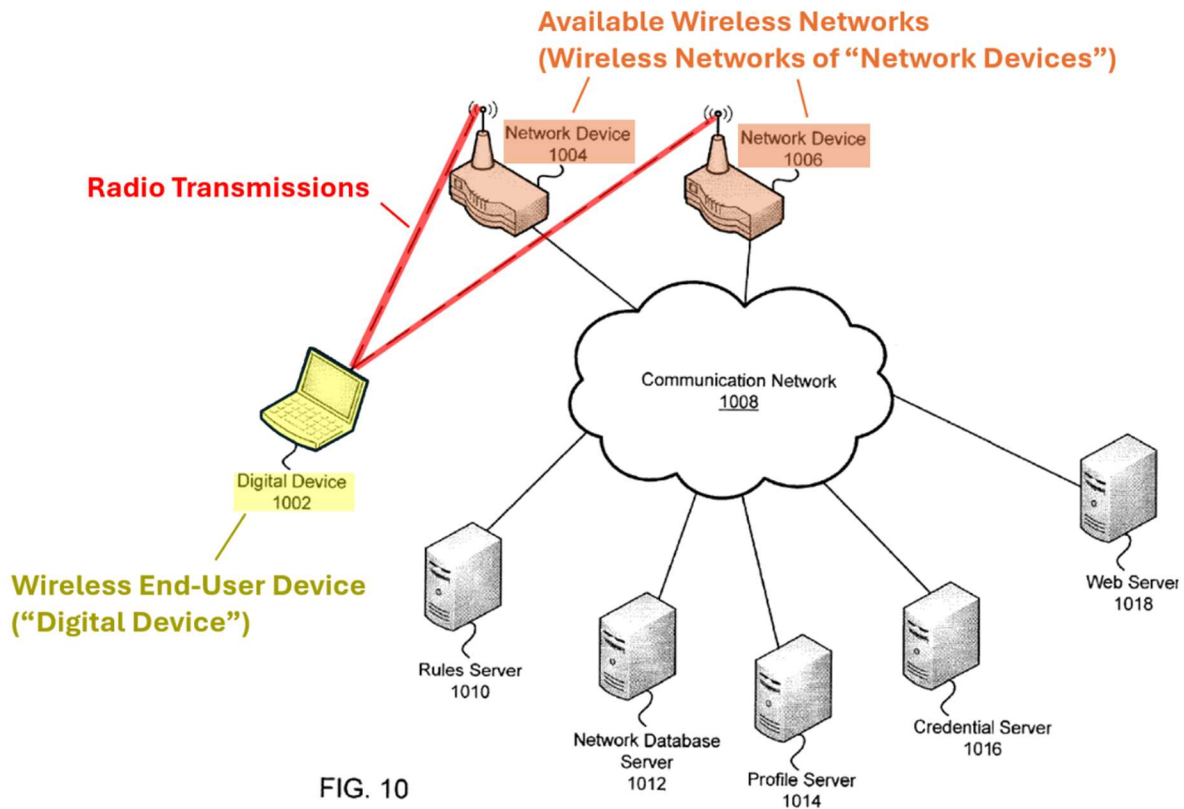
the “digital device 1002 may scan the area surrounding the digital device 1002, detect the two network devices 1004 and 1006, and generate a list of available wireless networks with which the digital device 1002 may establish communication”), 170 (stating “the digital device 1002 generates a list of available Wi-Fi networks”).

71. *Wynn*’s network devices 1004 and 1006 are “separate access points which may each be used to establish communication between the digital device 1002 and the communication network 1008.” EX1005, ¶124. The network devices 1004 and 1006 may be, e.g., Wi-Fi network access points identified by an SSID identifier. *See* EX1005, ¶¶11 (“In one example, the listing of available Wi-Fi networks comprises a list of Wi-Fi network SSID identifiers.”), 13 (“Wi-Fi networks, in homes, business[es,] and Hotspots can be identified by a human readable name (e.g., the SSID identifier).”), 89 (“The SSID 410 comprises an identifier of the network access point or Wi-Fi service provider.”), 125 (stating the “available wireless networks comprises DDID, SSID, and/or BSID identifiers of the network devices 1004 and 1006”), 146 (stating the “list of available wireless networks” from digital device 1002 “comprises the SSIDs or BSIDs of one or more network devices (e.g., network device 1004 and network device 1006)”), 164 (describing that digital device 1002 “enters into an area with two wireless networks and the digital device 1202 scans for networks to access,” and “receives a first and

a second network identifier of available wireless networks,” where “the first network identifier may comprise both the BSID and the SSID of the first network device while the second network identifier is only an SSID of the second network device”).

72. The network devices are “associated with” respective wireless networks that a digital device may use to access another network, such as the Internet. EX1005, ¶¶166 (“The wireless network selection may comprise an identifier that identifies the selected wireless network or identifies the network device associated with the selected wireless network (e.g., a BSID and/or SSID of the network device).”), 174 (“In various embodiments, the network device 1004 and network device 1006 provide ... first and second network identifiers to the digital device 1002 in steps 1302 and 1304. In step 1306, the digital device 1002 generates metrics (i.e., attributes) by taking measurements regarding wireless networks associated with the network device 1004 and network device 1006.”), 122 (“[A] wireless network is a network that allows wireless access between a digital device and a communication network such as the Internet.”), Fig. 13.

73. The connections between the **radio** of **digital device 1002** and **network devices 1004** and **1006** are shown below in annotated Figure 10. EX1005, ¶¶124-126, Fig. 10.



EX1005, Fig. 10.

74. The available wireless networks identified by the radio of *Wynn*'s digital device 1002 (e.g., the wireless networks respectively associated with network device 1004 and network device 1006) are also "different than a current wireless network to which the end user device is currently connected." For example, digital device 1002 provides information regarding available wireless networks (e.g., information regarding the wireless networks of network devices 1004 and 1006) to a remote server such as rules server 1010 or profile server 1014. EX1005, ¶¶124-127. To do so, "digital device 1002 provides the list of available wireless networks over **another network such as a cellular communication**

**network** (e.g., via CDMA, GSM, 3G, or EVDO).” EX1005, ¶¶126, 170. Because *Wynn*’s digital device 1002 transmits information regarding available wireless networks to a remote server using a “cellular communication network,” in this example, the cellular network is the “current wireless network to which the end user device is currently connected,” and it is a different network than the available wireless networks (e.g., the wireless networks of network devices 1004 and 1006) detected by the radio of digital device 1002.

**3. 1[b]: “a prioritized network selection engine configured to”**

75. *Wynn* discloses 1[b]. While *Wynn* describes an exemplary server-based system for selecting the best available wireless network for digital device 1002 (e.g., EX1005, ¶¶137-141), *Wynn* also discloses that “the selection of the wireless networks may occur within the digital device 1002.” EX1005, ¶145; *see also* EX1005, ¶172 (stating “those skilled in the art will appreciate that a server is not necessary” for digital device 1002 to analyze available networks and to select a wireless network). *Wynn*’s digital device 1002 thus “performs the analysis to determine the preferred wireless network” based on a variety of “configuration preferences,” such as “one or more locally executed rules, preferred signal strength, or any other attribute or attributes.” EX1005, ¶145; *see also* EX1005, ¶172 (“The digital device 1002 may then make comparisons based on what

attributes associated with the networks are available to make a selection or generate a prioritized list.”).

76. In my opinion, a POSITA would have understood that *Wynn*’s digital device 1002, which can be a wireless end-user device such as a cellular phone or personal digital assistant (EX1005, ¶¶55, 123), includes stored software instructions that execute the functionality that *Wynn* describes for the digital device 1002. For example, *Wynn* states that (EX1005, ¶230):

The above-described functions and components can be comprised of instructions that are stored on a storage medium such as a computer readable medium. The instructions can be retrieved and executed by a processor. Some examples of instructions are software, program code, and firmware. Some examples of storage medium are memory devices, tape, disks, integrated circuits, and servers. The instructions are operational when executed by the processor to direct the processor to operate in accord with embodiments of the present invention. Those skilled in the art are familiar with instructions, processor(s), and storage medium.

77. Especially in view of *Wynn*’s statement that “[t]hose skilled in the art are familiar with instructions, processor(s), and storage medi[a],” a POSITA would have understood that *Wynn*’s digital device 1002 includes software “instructions

that are stored on a storage medium” that are “retrieved and executed by a processor,” including instructions to carry out *Wynn*’s described wireless network selection functionality. EX1005, ¶230; *see also, e.g.*, EX1006, ¶115 (describing a similar wireless communication device 500 including “a processor” that “operates to execute instructions stored in a memory 550 (e.g., software and/or firmware instructions),” and disclosing that “[t]he memory 550 may, for example, operate to store instructions that, when executed by the processor 560, operate to perform” the operations). In my opinion, a POSITA would have understood *Wynn*’s digital device contains stored instructions for analyzing available wireless networks that are a “prioritized network selection engine” at least because it is a software process enabling the digital device to select a network out of multiple available options based on a set of locally executed rules and attributes. EX1005, ¶¶145, 172. That device software uses the selection engine to, *inter alia*, “generate a prioritized list” of available wireless networks. EX1005, ¶172.

78. As described below, *Wynn*’s “prioritized network selection engine” is further configured to perform each of the processes of the engine recited in claims 1[b.i]-1[b.v].

**4. 1[b.i]: “select one of the available wireless networks based on a prioritized network list,”**

79. *Wynn* discloses 1[b.i]. As discussed above for claim 1[b], *Wynn*’s digital device 1002 includes a prioritized network selection engine that detects available networks, selects one of those networks to analyze (e.g., by evaluating the “attributes” of the wireless network), and selects a wireless network for the digital device to connect to based on the network analysis. EX1005, ¶¶145, 172, 173.

80. As the initial step of its wireless-network analysis, *Wynn*’s digital device 1002 “retrieves the scan results listing available wireless networks and selects a wireless network based on configuration preferences,” such as the attributes of each wireless network. EX1005, ¶145. *Wynn*’s digital device “measures attributes” of an available wireless network after the device “accesses a **selected** wireless network.” EX1005, ¶173. *Wynn* further discloses that the digital device “generates a list of available wireless networks and then retrieves any available information regarding the networks on the list,” including by doing so “from a local or remote database.” EX1005, ¶172. *Wynn*’s digital device may evaluate (e.g., “take[] a performance metric”) for multiple networks identified in the prioritized network list. EX1005, ¶¶147 (stating the digital device “takes a performance metric for one or more networks and/or network devices that are

identified on the list of available wireless networks”), 173 (“[T]he digital device 1002 may generate and provide attributes regarding one or more networks to update the network profiles.”).

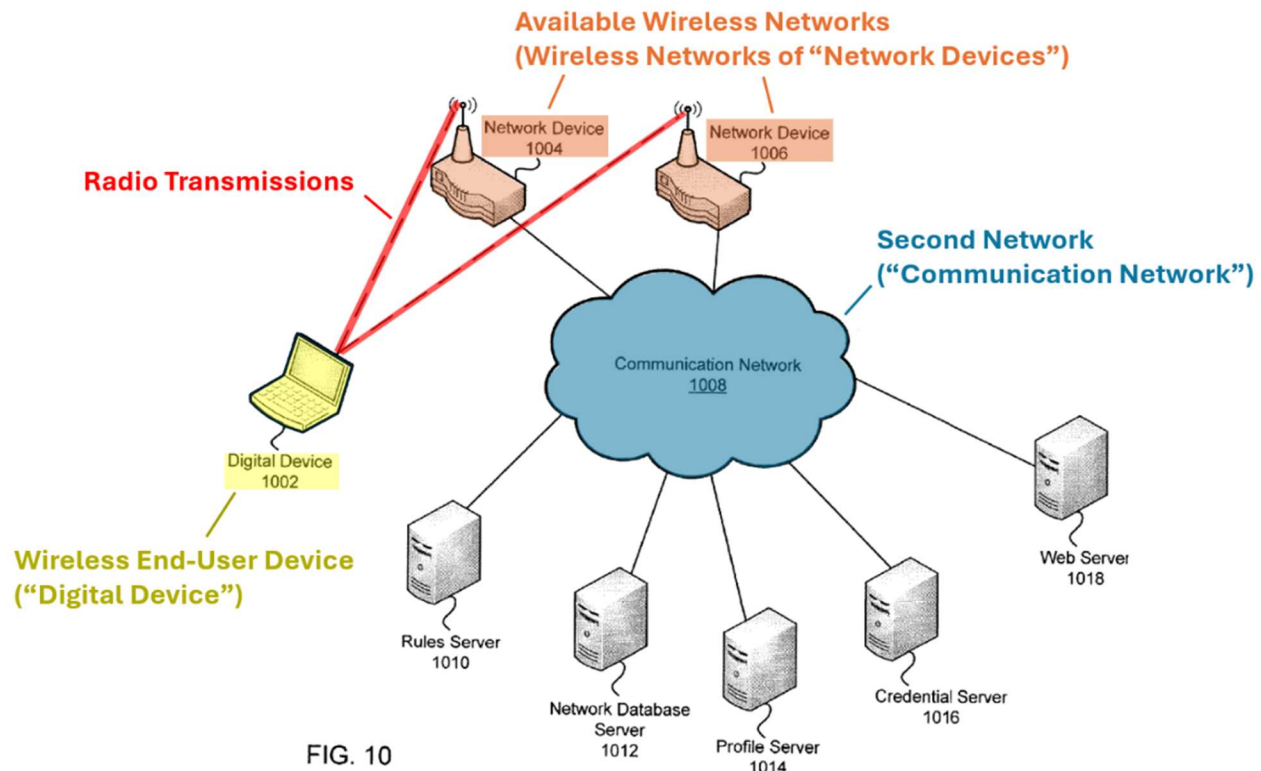
81. *Wynn*’s digital device 1002 may itself “generate a prioritized list” of available wireless networks based on available network information, such as the network’s attributes. EX1005, ¶172. Alternatively, as discussed further below for claim 2, the digital device may receive a “prioritized list of available wireless networks sorted by preference” from a remote server (e.g., *Wynn*’s rules server 1010). EX1005, ¶¶166, 184. For example, *Wynn*’s rules server “selects a network device based on comparing the attributes from within the network profiles” before “prepar[ing] a prioritized list of the two network devices from the list provided by the digital device 1002. The list is prioritized based on which of the two network devices provides the most desirable service based on the metrics from the network profiles.” EX1005, ¶180. The “network devices” in this context are “associated with” respective wireless networks that the digital device 1002 may select as part of its wireless-network evaluation process. EX1005, ¶¶166, 174.

82. As a result, the network selection engine of digital device 1002 selects one of the available wireless networks based on a “prioritized network list” that may be generated locally by digital device 1002 or sent to the device by a remote server. After receiving the list, the digital device’s network selection software (the

claimed “prioritized network selection engine”) selects one of the available wireless networks from the prioritized list to perform the network evaluation steps recited in subsequent claim steps. EX1005, ¶¶166 (“the **wireless network selection**” provided to the digital device by a remote server “may comprise a **list of wireless networks sorted by preference**”), 173 (“the digital device 1002 accesses a **selected wireless network**” and then “measures attributes” of the network). These steps entail evaluating the attributes of the available wireless networks “at any time,” including after receiving a “prioritized list of available wireless networks sorted by preference” from rules server 1010 (EX1005, ¶184) but “prior to logging into” the wireless network. *See, e.g.*, EX1005, ¶¶173 (“Attributes (e.g., latency metrics, bandwidth metrics, and QOS metrics) may be taken by the digital device 1002 **at any time** and used to update the network profiles.”), 192 (“[t]he digital device may provide attributes to the network database **at any time**,” e.g., “the digital device provides the attributes to the network database **prior to logging into a wireless network** (e.g., as a standard protocol over an open port)”). *Wynn* further states that, after receiving a “wireless network selection” from the rules server (EX1005, ¶181), the digital device can “generate[] additional attributes regarding the network (i.e., take additional measurements).” EX1005, ¶182.

5. **1[b.ii]: “cause the wireless end-user device to connect through the selected available wireless network to a network element in a second network reachable through the selected available wireless network,”**

83. *Wynn* discloses 1[b.ii]. As shown below in annotated Figure 10, *Wynn*’s **digital device 1002** (the claimed “wireless end-user device”) uses one of **network devices 1004** and **1006** (access points for an “available wireless network” that may be “selected” by the digital device) to “establish communication between the **digital device 1002** and the **communication network 1008**.” EX1005, ¶124. *Wynn* further explains that **network devices 1004** and **1006** are “associated with” wireless networks (EX1005, ¶¶166, 174) that “allow[] wireless access between a **digital device** and a **communication network such as the Internet**.” EX1005, ¶122.



EX1005, Fig. 10.

84. To evaluate the wireless networks available to the **digital device**, Wynn's **digital device 1002** connects through the **selected available wireless network** (e.g., a **wireless network** of **network device 1004** or **network device 1006**) to a **network element** (e.g., a "server") in a **second network** (e.g., **communication network 1008**) reachable through the **selected available wireless network**. For example, Wynn's **digital device 1002** "takes a performance metric for one or more networks and/or network devices that are identified on the list of available wireless networks." EX1005, ¶147. These "performance metric[s]" are

characteristic attributes of the wireless networks that may be “any measure of network performance,” such as a “latency metric” or a “bandwidth metric.”

EX1005, ¶128.

85. For the bandwidth metric, *Wynn*’s “**digital device**” may test available bandwidth by sending a block of data over the **wireless network** to a **server** and timing the response.” EX1005, ¶130. *Wynn* thus discloses the **digital device** connecting through a **selected available wireless network** to communicate with a **server** (the claimed “**network element**”). In my opinion, a POSITA would have understood (or at least found it obvious) that *Wynn*’s “server,” which is accessible “through” the wireless network given *Wynn*’s statement that the data sent to the server is sent “over” the wireless network (EX1005, ¶130), is accessible, e.g., via the Internet (such as through *Wynn*’s **communication network 1008**, the claimed “**second network**”). EX1005, ¶¶122, 124. *Wynn* further states that its various disclosed servers “may all be combined as one or more servers. Similarly, the functions of any of the servers may be performed by one of the other servers depicted or any other server.” EX1005, ¶144.

86. *Wynn*’s digital device thus connects “through the selected available wireless network to a network element in a second network reachable through the selected available wireless network.” Moreover, this process occurs as part of the wireless network evaluation process carried out by the **digital device’s** software

(the claimed “prioritized network selection engine”) described in claim 1[b] above and is thus “cause[d]” by the “prioritized network selection engine.”

87. In addition to measuring bandwidth, *Wynn* describes a “latency metric,” which is “a measurement that represents time to send a packet of data from the digital device to a server on a network.” EX1005, ¶129. For example, “the digital device 1002 may send an ICMP ‘echo request’ packet to a server and listen for an ICMP ‘echo response’ reply.” EX1005, ¶129. As with the bandwidth testing, a POSITA would have understood that the latency testing “**server**” (the claimed “**network element**”) is accessed through the selected **wireless network** to facilitate the **digital device** evaluating the latency of the **wireless network**. In my opinion, a POSITA would have further expected the “**server**” to be accessible via the Internet, such as *Wynn*’s **communication network 1008** (the claimed “**second network**”).

88. Underscoring that *Wynn*’s digital device 1002 is configured to send information (e.g., a list of available wireless networks) through the wireless network to a remote server, *Wynn* describes sending digital device information to communication network 1008 “as a standard protocol over an open port of either the network device 1004 or the network device 1006.” EX1005, ¶126. *Wynn*’s use of an “open port” of the network device means that the digital device’s transmitted

data travels “through” the network device to reach the Internet (e.g., communication network 1008).

**6. 1[b.iii]: “initiate an upload and/or download sequence between the wireless end-user device and the network element,”**

89. *Wynn* discloses 1[b.iii]. As discussed above for claim 1[b.ii], *Wynn* discloses communications between a digital device (the claimed “wireless end-user device”) and a server used for bandwidth testing or a server used for latency testing (the claimed “network element”) to evaluate the performance of an available wireless network. EX1005, ¶¶128-130.

90. Claim 1[b.iii] recites an “upload and/or download” sequence and is thus satisfied by an upload sequence, a download sequence, or a combination of the two. *Wynn* discloses, or at least renders obvious, each option. For bandwidth testing, *Wynn*’s “digital device may test available bandwidth by sending a **block of data** over the wireless network to a server and timing the response.” EX1005, ¶130. In my opinion, a POSITA would have understood that a digital device transmitting a “block of data” upstream to a server to evaluate the available bandwidth of a wireless network constitutes at least an “upload sequence,” since data transmitted in the upstream direction is an “upload,” and the described process includes timing the response to the data upload, thus requiring multiple sequential steps for the upload process. Similarly, *Wynn* discloses that its digital device

receives a “response” to the upload sequence as part of its bandwidth testing. In my opinion, a POSITA would have understood this “response” is data transmitted from the server to the digital device that is a “download” performed in connection with the initial upload process, and a POSITA would at least have found it obvious that *Wynn*’s bandwidth evaluation of a wireless network performs a download sequence in connection with this testing.

91. In my opinion, a POSITA would have been familiar with the well-understood concept of characterizing a network’s available bandwidth by sending data upstream (uploading) and receiving data downstream (downloading) with a remote server on a communication network such as the Internet. As discussed above in Section VII.B, such bandwidth testing has been a routine and conventional aspect of characterizing network performance known in the field for several decades. Thus, testing bandwidth in *Wynn*’s system using a download sequence (e.g., by receiving a “block of data over the wireless network” (EX1005, ¶130) **from** a server) in addition to the aforementioned upload sequence would at least have been obvious to a POSITA, since bandwidth testing was routinely and conventionally used to test a network’s performance through testing download speed in addition to upload speed. Given the conventional and well-understood nature of testing network bandwidth by downloading data over the network, a

POSITA would have had a reasonable expectation of success in doing so in *Wynn*'s system.

92. *Wynn*'s "latency metric" is an additional and alternative example of using an upload and download sequence of data to evaluate a wireless network's latency. As described above for claim 1[b.ii], *Wynn*'s "latency metric" is "a measurement that represents time to send a packet of data from the digital device to a server on a network." EX1005, ¶129. For example, "the digital device 1002 may send an ICMP 'echo request' packet to a server and listen for an ICMP 'echo response' reply." EX1005, ¶129. In my opinion, a POSITA would have understood that *Wynn*'s process of sending an "ICMP 'echo request'" packet from the digital device to a server constitutes the claimed "upload sequence," and the resulting step of listening for an ICMP "echo response reply" constitutes a claimed "download sequence," since these processes involve transmitting data over a network either in an upstream (upload) or downstream (download) direction and include multiple sequential process steps to evaluate the wireless network's latency relative to the digital device. For example, in addition to transmitting data such as an (upstream) ICMP "echo request" packet to a server and receiving a (downstream) ICMP "echo response" reply, *Wynn*'s latency testing includes an additional step (e.g., a "sequence" step) of correlating the data transmission to elapsed time to calculate network latency. *See, e.g.*, EX1005, ¶129 ("The latency metric may comprise an

estimate of the round-trip time (generally in milliseconds) and/or include any packet loss. In another example, the latency metric is half of the estimated round-trip time.”).

**7. 1[b.iv]: “characterize performance of the selected available wireless network based on the conducted upload and/or download sequence, and”**

93. *Wynn* discloses 1[b.iv]. As described above for claim 1[b.iii], *Wynn*’s digital device 1002 analyzes the performance of available wireless networks by conducting an “upload and/or download sequence,” such as by testing the available bandwidth and latency of the selected wireless network. EX1005, ¶¶128-130.

94. *Wynn* further discloses that digital device 1002 uses the results of the bandwidth and latency testing to characterize the performance of the selected available wireless network. For example, noting that “the selection of the wireless networks may occur within the digital device 1002,” *Wynn* states that the digital device “selects a wireless network based on configuration preferences,” which can include network attributes such as the network’s latency and that can be based on “one or more locally executed rules.” EX1005, ¶145. *Wynn*’s digital device thus “performs the analysis” of the available networks, including analyses based on network attributes such as available bandwidth/latency, “to determine the preferred wireless network.” EX1005, ¶145; *see also* EX1005, ¶172 (“The digital device 1002 may then make comparisons based on what attributes associated with the

networks are available to make a selection or generate a prioritized list. The digital device 1002 may then access the selected wireless network.”).

8.     **1[b.v]: “determine, based at least in part on the characterized performance, to communicate network data for the wireless end-user device through the selected available wireless network instead of the current wireless network.”**

95.     *Wynn* discloses 1[b.v]. As discussed above for claims 1[b.iii] and 1[b.iv], *Wynn*’s digital device 1002 (and the associated software of the device, including the claimed “prioritized network selection engine”) uses the characterized performance information for a wireless network (e.g., network attributes such as bandwidth availability and latency) to determine whether to connect to an available wireless network. For example, *Wynn*’s digital device 1002 makes “comparisons based on what attributes associated with the networks are available to make a selection.” EX1005, ¶172. The “digital device 1002 may then access the selected wireless network” in response to that comparison of attributes of available wireless networks. EX1005, ¶172.

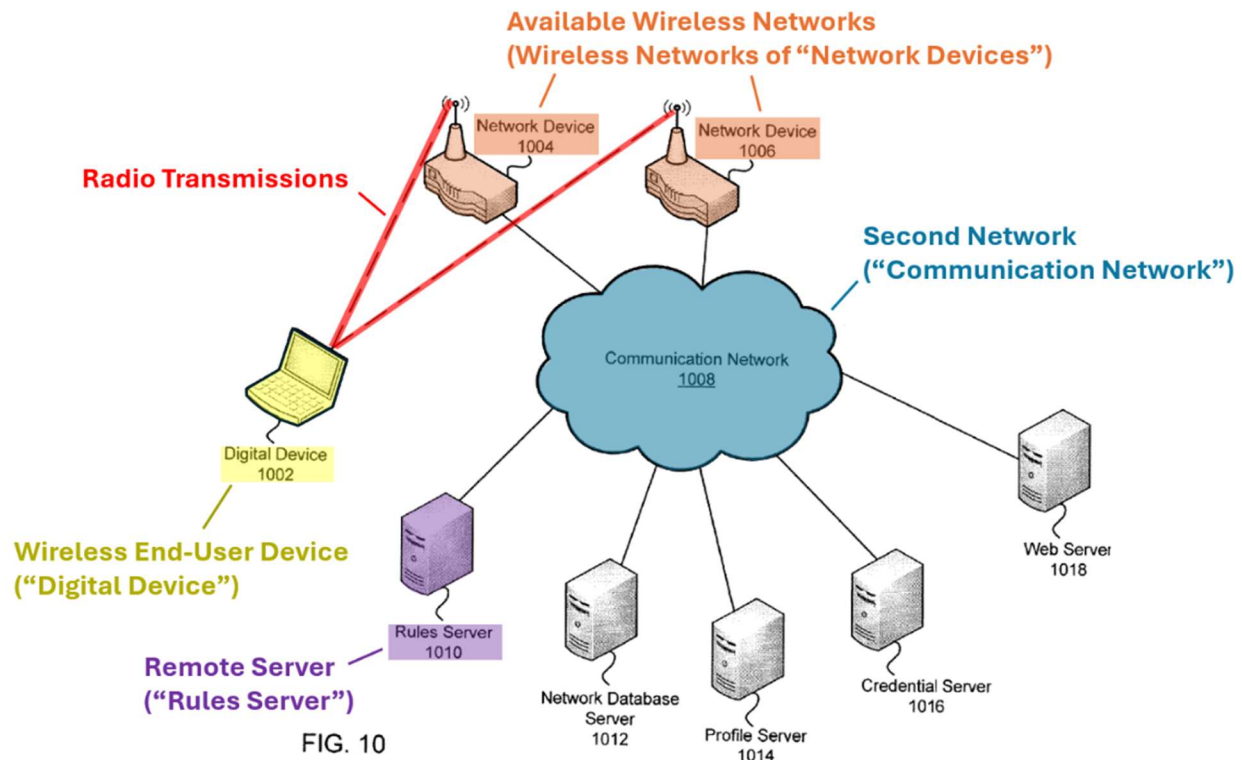
96.     Moreover, as discussed above in claim 1[a], at the time digital device 1002 scans for available wireless networks, it may communicate information about those available networks to a remote server through a cellular connection, illustrating that the “current wireless network” of the digital device during the scan of available wireless networks can be a cellular network. EX1005, ¶¶126, 170. The

digital device therefore determines whether to communicate network data for the digital device through the selected available wireless network (e.g., one of the wireless networks of network devices 1004 or 1006), instead of remaining connected to the current network (e.g., a cellular network), based on its characterized performance of available networks.

**C. Dependent Claims**

- 1. Claim 2: “The wireless end-user device of claim 1, configured to receive the prioritized network list from a remote server.”**

97. *Wynn* discloses this additional limitation. As discussed above for claim 1[b.i], *Wynn*’s digital device 1002 (the claimed “wireless end-user device”) is configured to receive a prioritized network list from a remote server (e.g., *Wynn*’s rules server 1010). EX1005, ¶184. The **digital device** and **rules server** are shown in *Wynn*’s annotated Figure 10 below. EX1005, Fig. 10.



EX1005, Fig. 10.

98. For example, *Wynn*’s digital device receives a “prioritized list of available wireless networks sorted by preference” from rules server 1010. EX1005, ¶184; *see also* EX1005, ¶141 (stating rules server 1010 can send digital device 1002 a “wireless network selection” that may “comprise a sorted list of wireless networks which is sorted in order of preference”). *Wynn*’s rules server “selects a network device based on comparing the attributes from within the network profiles” associated with each available wireless network before “prepar[ing] a prioritized list of the two network devices from the list provided by the digital

device 1002. The list is prioritized based on which of the two network devices provides the most desirable service based on the metrics from the network profiles.” EX1005, ¶180. The “network devices” in this context are “associated with” respective wireless networks that the digital device 1002 may select as part of its wireless network evaluation process. EX1005, ¶¶166, 174. *Wynn*’s digital device 1002 “retrieves any available information regarding the networks” from a variety of possible sources, including from a “remote database” or “from another network such as the Internet.” EX1005, ¶172.

99. Although *Wynn* discloses that rules server 1010 may itself analyze available wireless networks to determine which network the digital device should connect to, *Wynn* discloses that the digital device can evaluate the attributes (e.g., available bandwidth or latency) of the available networks “at any time,” including doing so prior to switching its connection to the selected available network. *See, e.g.*, EX1005, ¶¶173 (stating the “digital device 1002 accesses a **selected wireless network**” and then “**measures attributes**” such as “latency metrics, bandwidth metrics, and QOS metrics,” which “may be taken by the digital device 1002 **at any time** and used to update the network profiles”), 192 (“[t]he digital device may provide attributes to the network database **at any time**,” e.g., “the digital device provides the attributes to the network database **prior to logging into a wireless network** (e.g., as a standard protocol over an open port)”). *Wynn* further states

that, after receiving a “wireless network selection” from the rules server (EX1005, ¶181), the digital device can “generate[] additional attributes regarding the network (i.e., take additional measurements).” EX1005, ¶182. The digital device can then compare attributes (e.g., bandwidth or latency measurements) of different wireless networks to determine which wireless network to connect to. EX1005, ¶¶145 (stating the digital device 1002 “performs the analysis to determine the preferred wireless network” based on “network profiles”), 172 (“The digital device 1002 may then make comparisons based on what attributes associated with the networks are available to make a selection.”).

100. In my opinion, a POSITA would thus have understood that *Wynn*’s digital device can evaluate the attributes of available wireless networks, for example, after receiving a prioritized list of available networks from a remote server to further characterize the performances of those networks, consistent with the processes of claims 1[b.ii]-1[b.iv].

**2. Claim 3: “The wireless end-user device of claim 1, configured to supply information based on the characterized performance to an access network characterization server that collects such information from a plurality of wireless end-user devices.”**

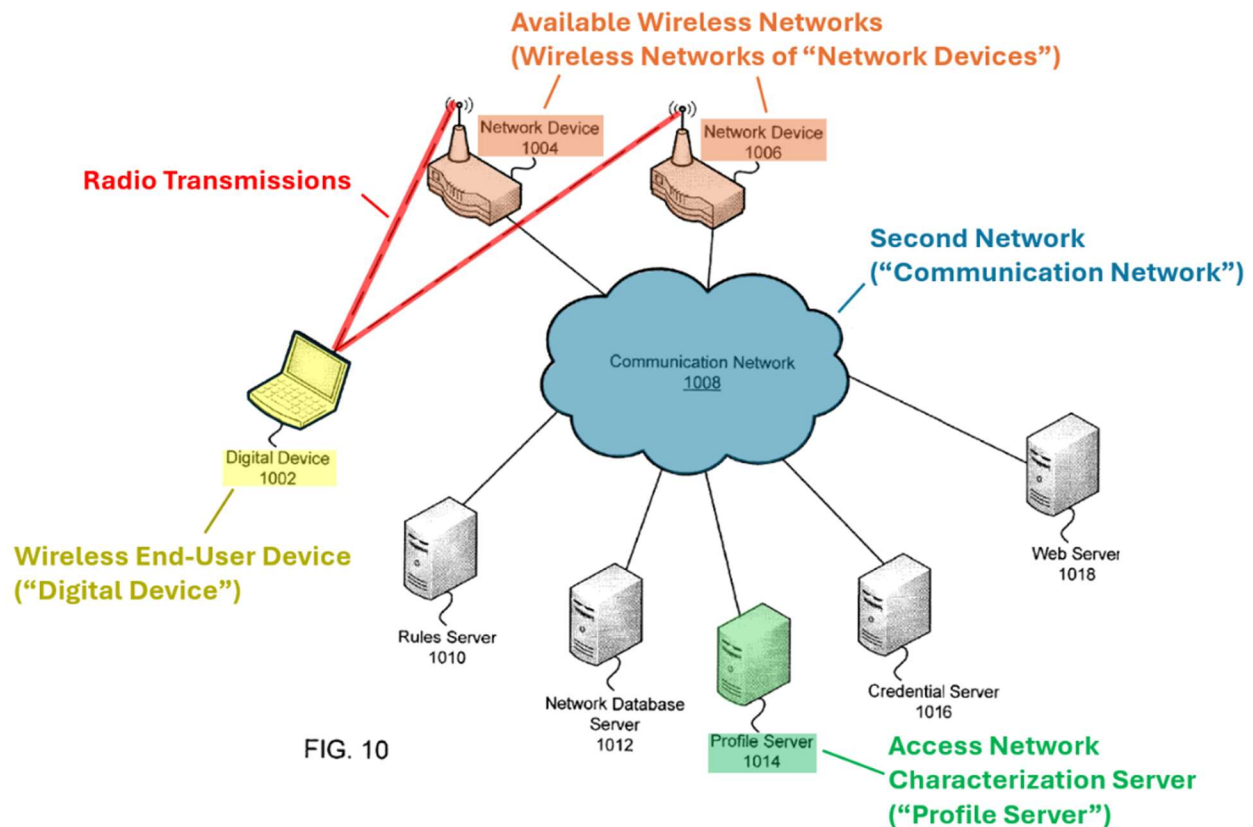
101. *Wynn* discloses this additional limitation. For example, *Wynn* describes a “network database” (the claimed “access network characterization server”) that “may be used to centralize information regarding many different

networks,” including doing so based on the information received from multiple end-user devices. EX1005, ¶188. The network database “may store a plurality of network profiles. Each network profile within the network database may be associated with a separate network. In some examples, the network profile is associated with a separate network by [a] BSID, DDID, SSID, or other identifier.” *Id.* Moreover, “[e]ach network profile may comprise attributes **from one or more users.**” *Id.*

102. *Wynn*’s network database, for example, is supplied “information based on the characterized performance” of a wireless network (e.g., wireless network attributes that are generated and provided to the network database by a digital device 1002, EX1005, ¶173) from “**many digital devices** that access the same wireless network,” and the database collects and stores that information. EX1005, ¶189; *see also* EX1005, ¶191 (“**Digital devices** may scan or receive attributes regarding different network devices and/or networks. These attributes may be provided to a network database where the information will be stored and aggregated with other attributes for the same network.”).

103. *Wynn*’s “network database” (the claimed “access network characterization server”) may be, for example, **profile server 1014** shown in Figure 10. EX1005, ¶222 (“**[e]ach digital device** may provide attributes to a

server such as the **profile server 1014**,” and “the **profile server** may receive multiple attributes for a **first wireless network** from **multiple users**”), Fig. 10.



EX1005, Fig. 10.

104. The server storing network attributes, alternatively, “may be any kind of server (e.g., a rules server 1010, network database server 1012, profile server 1014, credential server 1016, or web server 1018).” EX1005, ¶¶194-195.

3. **Claim 4: “The wireless end-user device of claim 1, wherein the prioritized network selection engine configured to cause the wireless end-user device to connect through the selected available wireless network comprises configured to automatically cause the wireless end-user device to connect through the selected available wireless network.”**

105. *Wynn* discloses this additional limitation. As discussed above for claim 1[b], *Wynn*’s digital device 1002 performs functionality that a POSITA would have understood is executed by software on the digital device (including software relating to available wireless-network analysis and selection, the claimed “prioritized network selection engine”).

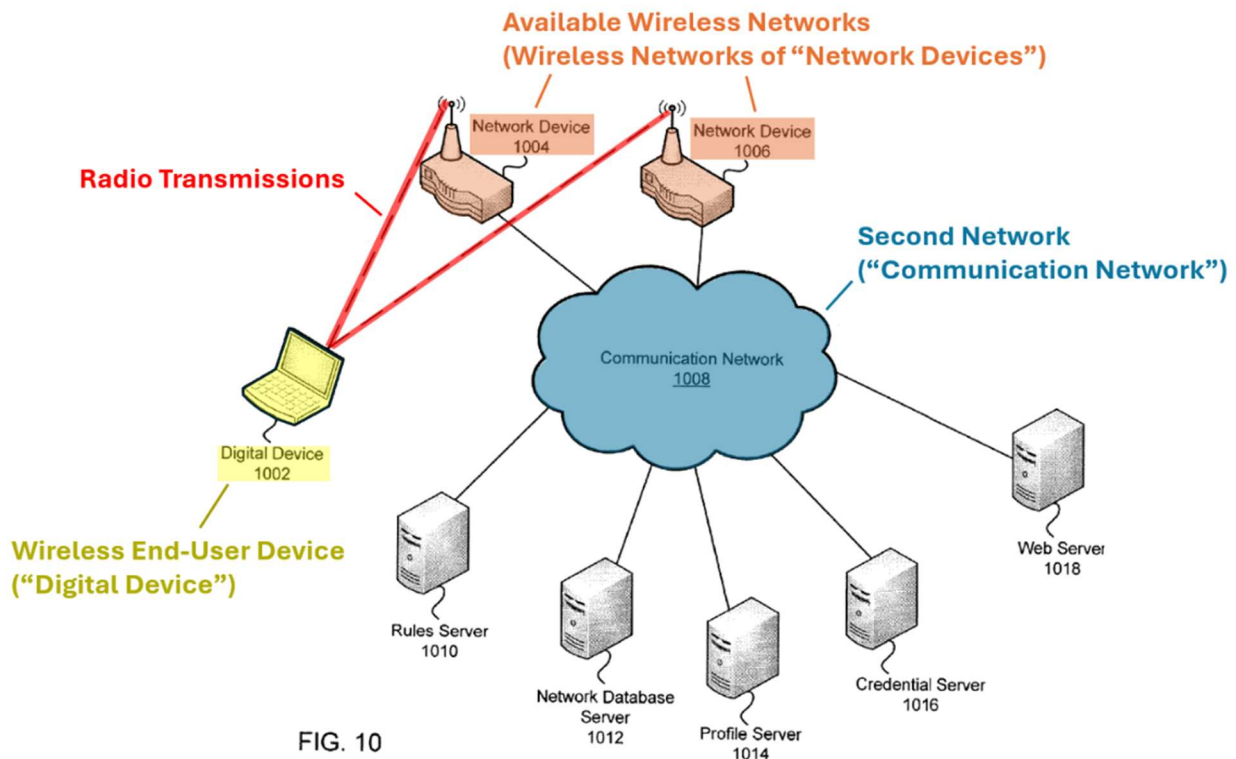
106. *Wynn* further discloses its digital device 1002 (the claimed “wireless-end user device”) connecting automatically through a selected available wireless network (e.g., connecting to the wireless network associated with one of digital device 1004 or digital device 1006 to access communication network 1008, as discussed above in claim 1). *Wynn* states, for example, that its systems and methods “enable a digital device to **automatically** select and **access** an available wireless network from a plurality of available wireless networks based on rules to achieve a satisfactory quality of service.” EX1005, ¶122; *see also* EX1005, ¶4 (“[T]he invention relates to the automatic access of wireless communication networks.”).

4. **Claim 5: “The wireless end-user device of claim 1, wherein the prioritized network selection engine configured to cause the wireless end-user device to connect through the selected available wireless network comprises configured to cause the wireless end-user device to connect through the selected available wireless network in response to a user selection.”**

107. *Wynn* discloses this additional limitation. As discussed for claim 1[b], *Wynn*’s digital device 1002 performs functionality that a POSITA would have understood is executed by software on the digital device (including software relating to available wireless-network analysis and selection, the claimed “prioritized network selection engine”). Moreover, as discussed above for claim 4, *Wynn* discloses a wireless end-user device configured to “automatically cause the wireless end-user device to connect through the selected available wireless network.”

108. As an alternative to the digital device connecting to a selected available wireless network automatically, *Wynn* discloses that “the user of the digital device 1002 may override the wireless network selection to access any wireless network.” EX1005, ¶185. In my opinion, a POSITA would have understood that allowing a user to “override” the wireless network selection of the process constitutes a manual user selection of the desired wireless network. *Wynn* additionally discloses that “in one example, the user chooses the priority of available wireless networks.” EX1005, ¶185. A network user may thus manually

select the priority of available wireless networks in addition to manually selecting the network to connect to. This is an additional example of a “wireless end-user device” (*Wynn*’s **digital device 1002**) connecting through “the **selected available wireless network**” (e.g., connecting to one of the **wireless networks** associated respectively with **network device 1004** or **network device 1006** to access **communication network 1008**, as shown in Figure 10 below) “in response to a user selection.” EX1005, Fig. 10.



EX1005, Fig. 10.

5. **Claim 6: “The wireless end-user device of claim 1, wherein the prioritized network selection engine configured to cause the wireless end-user device to connect through the selected available wireless network comprises configured to automatically cause the wireless end-user device to connect through the selected available wireless network based on one or more user preferences.”**

109. *Wynn* discloses this additional limitation. As discussed above for claim 1[b], *Wynn*’s digital device 1002 performs functionality that a POSITA would have understood is executed by software on the digital device (including software relating to available wireless-network analysis and selection, the claimed “prioritized network selection engine”). Moreover, as discussed above for claim 4, *Wynn* discloses a wireless end-user device configured to “automatically cause the wireless end-user device to connect through the selected available wireless network.”

110. *Wynn* further discloses that the automatic network connection of its digital device can occur “based on one or more user preferences.” For example, *Wynn*’s network selection process considers “personalized settings for a user” that “are then applied to the attributes of the network profiles associated with a wireless network on the list. In various embodiments, users may configure personalized settings (e.g., the ‘aggressiveness’) at which a digital device 1002 may connect to a wireless network.” EX1005, ¶151. *Wynn* discloses “there may be many personalized settings,” including user-defined preferences related to, e.g., (1) the

shared status of the network; (2) the network's security settings; (3) only connecting to networks that have a profile previously established in *Wynn*'s profile server; or (4) networks offering desired services (e.g., videoconferencing) at a defined quality of service. EX1005, ¶¶152-156. The personalized settings may then be used to eliminate available wireless networks from the available network list that do not fit the user's desired criteria. EX1005, ¶¶156-157.

111. *Wynn*'s digital device (and the associated "prioritized network selection engine" software) can cause the digital device to connect to an available wireless network based on the user settings (*Wynn*'s "personalized settings") and connect to another network (e.g., *Wynn*'s communication network 1008) through the selected wireless network. For example, *Wynn*'s digital device 1002 "may also comprise personalized settings which may indicate a preference between the two network identifiers or eliminate one or both of the network identifiers." EX1005, ¶175. Digital device 1002 "selects a wireless network based on configuration preferences," including "one or more locally executed rules, preferred signal strength, or any other attribute or attributes." EX1005, ¶145. For example, "digital device 1002 selects a wireless network that supports a desired service (e.g., VOIP), meets a minimum latency standard, and meets a minimum QOS standard." EX1005, ¶145; *see also* EX1005, ¶156 (describing the aforementioned "personalized settings" relating to a desired service (videoconferencing) and "a

user[-]defined QOS requirement”). As a result, a POSITA would have understood that *Wynn*’s digital device includes software (e.g., a “prioritized network selection engine”) that is “configured to cause the wireless end-user device to connect through the selected available wireless network,” and that is “configured to automatically cause the wireless end-user device to connect through the selected available wireless network based on one or more user preferences.”

**6. Claim 9: “The wireless end-user device of claim 1, wherein the radio comprises a WiFi radio.”**

112. *Wynn* discloses, or at least renders obvious, claim 9. As discussed above for claim 1[a], *Wynn*’s digital device (“wireless end-user device”) includes a WiFi radio. For example, *Wynn*’s digital device includes a WiFi radio enabling digital device 1002 to communicate through a Wi-Fi network for network access. EX1005, ¶¶123 (describing “a wireless digital device (e.g., digital device capable of Wi-Fi communication)”), 170 (stating “the digital device 1002 generates a list of available Wi-Fi networks”); *see also* EX1001, 14:33-36 (describing the ’757 patent’s implementation of a “radio interface 402 [that] includes applicable known or convenient technology sufficient to enable a wireless device to use a radio to connect to a wireless network”). The WiFi radio allows the digital device to scan for available Wi-Fi networks and to connect to those networks. *See, e.g.*, EX1005, ¶¶125 (stating the “digital device 1002 may scan the area surrounding the digital

device 1002, detect the two network devices 1004 and 1006, and generate a list of available wireless networks with which the digital device 1002 may establish communication”), 172 (after detecting and evaluating available Wi-Fi networks, “[t]he digital device 1002 may then access the selected wireless network”).

**7. Claim 10: “The wireless end-user device of claim 9, further comprising a cellular radio, and wherein at a time that the WiFi radio identifies available wireless networks, the current wireless network is a cellular wireless network.”**

113. *Wynn* discloses, or at least renders obvious, this additional limitation. As discussed above for claim 1[a], *Wynn*’s digital device (“wireless end-user device”) includes a WiFi radio. As additionally discussed for claim 1[a], the digital device further includes a cellular radio enabling the digital device to transmit information (such as a list of available wireless networks) over a “cellular communication network (e.g., via CDMA, GSM, 3G, or EVDO).” EX1005, ¶126.

114. *Wynn* describes an exemplary scenario in which, “at a time that the WiFi radio identifies available wireless networks, the current wireless network is a cellular wireless network.” Specifically, *Wynn* states that “the digital device 1002 **generates a list of available Wi-Fi networks and provides the list [to a server] over a cellular network (e.g., EVDO or 3G network).**” EX1005, ¶170. Then, “the wireless network selection may be **returned to the digital device over the cellular network** and then the digital device 1002 **may attempt to access the**

**preferred Wi-Fi network.”** *Id.* Because the digital device in this example provides information about available wireless networks to a server “over a cellular network,” the cellular network is the “current wireless network” of the digital device at the time the digital device’s WiFi radio identifies available wireless networks.

115. In my opinion, a POSITA would have understood—or at least found it obvious—that *Wynn*’s WiFi radio and cellular radio are two separate radios within digital device 1002. For example, a POSITA would have known that, by 2009, cellular phones and personal digital assistants (*Wynn*’s examples for its digital device, EX1005, ¶55) providing both cellular and WiFi connectivity would typically use two different radios for that functionality. EX1009, ¶6 (*Man*, published in 2008, stating in its technology background section that “[i]n a mobile wireless communications device, if the cellular capability is integrated with WiFi capability, **often two different antennas are used**”).

116. In my opinion, a POSITA would have known that it is preferable to use two separate antennas (each associated with a separate radio) for the different network types for several reasons, including because cellular and WiFi networks transmit and receive signals at different frequencies and require different communication protocols, and are thus incompatible for sharing frequencies and antennas. *See, e.g.*, EX1009, ¶6 (noting that WiFi transmissions operate in the 2.4

GHz and 5.0 GHz frequency bands, while cellular GSM communications are operative, for example, at 850 MHz); EX1006, ¶¶111-113 (describing a wireless communication device 500 that includes a “first communication interface module 510” using a “first antenna 512” for a first communication protocol, and “second communication interface module 520” using a “second antenna 522” for a second communication protocol, where the modules can “communicate serially and/or concurrently” in communication network systems, including “cellular communication” and “wireless computer network communication”).

117. *Man* further explains that a wireless communications device using WiFi and cellular communications involve two systems that “need to work simultaneously, and thus, **isolation between antennas is very critical.**” EX1009, ¶6. For example, *Man* states the wireless device “should be designed to reduce the coupling between the various antennas. This is necessary not only to enhance radio performance, but also reduce the cost of implementing Electromagnetic Interference (EMI) filters at harmonic frequencies.” EX1009, ¶6. Moreover, “the type of antenna designs used in such devices become[s] important to reduce the mutual coupling due to the third harmonics between a GSM or similar cellular antenna, operative, for example, at 850 MHz, and a WiFi antenna operative at 2.4 GHz. Isolating these antennas can be difficult, and different feeding techniques should be introduced to enhance isolation between the two antennas.” EX1009, ¶6.

118. In my opinion, a POSITA would have been well aware of the radio-coupling issues described by *Man* in a device including separate WiFi and cellular radios and would have been motivated, as a result, to isolate the antennas for the same reasons described by *Man*. Such issues have been known in the art of wireless communications well before the earliest possible priority date of the '757 patent in January 2009. Consistent with *Man*'s characterization of the state of the art, a POSITA would thus have been motivated to use different WiFi and radio antennas in the digital device of *Wynn* and would have at least found it obvious to do so. For example, underscoring that its WiFi and cellular radios may operate simultaneously (thus invoking the antenna isolation design considerations described by *Man*), *Wynn* describes generating a list of available WiFi networks while transmitting information over a cellular network. EX1005, ¶170; *see also* EX1009, ¶6 (stating the background-art wireless device's cellular and WiFi systems "need to work simultaneously, and thus, isolation between antennas is very critical"). In my opinion, a POSITA would have had a reasonable expectation of success in implementing separate cellular and WiFi radios in *Wynn*'s digital device at least because, as explained above, using two separate radios (and related hardware/software components in the device) for these separate communication protocols was well known in the art and was the most conventional manner of implementing such functionality in wireless devices. *See, e.g.*, EX1009, ¶6 ("In a

mobile wireless communications device, if the cellular capability is integrated with WiFi capability, **often two different antennas are used ....**”).

**XI. GROUND 2: CLAIMS 7 AND 8 ARE OBVIOUS OVER *WYNN* IN VIEW OF *KARAOGUZ***

**A. Overview of *Karaoguz***

119. *Karaoguz* discloses a “system and method for determining, based at least in part on communication device position, whether access to an alternative communication network is authorized.” EX1006, ¶7; EX1007, 11. A communication device in the system has “multimode communication capability (i.e., the capability to communicate through a plurality of different types of communication networks),” including “cellular communication networks” and “wireless LAN networks” (e.g., WiFi networks). EX1006, ¶16; EX1007, 8.

120. *Karaoguz* states that “[c]ommunication service providers (e.g., operators of one or more communication networks) have a financial stake in selling communication bandwidth.” EX1006, ¶15; EX1007, 8. For example, the “communication service providers (CSPs) are involved in subsidizing the purchase of communication devices,” such as “portable or mobile communication devices like cellular phones [and] personal digital assistants (PDAs),” with a “goal of receiving a return on their investment through the sale of communication bandwidth (e.g., by selling service plans).” EX1006, ¶15; EX1007, 8.

121. *Karaoguz* describes “situations where providing a mobile communication device access to alternative (e.g., non-native) communication pathways (e.g., through non-cellular networks or non-cellular networks operated by entities other than the CSP) is beneficial to the cellular CSP.” EX1006, ¶19; EX1007, 9. For example, “a cell (or other coverage area) associated with the CSP might be overloaded or at risk of becoming overloaded. Thus, the CSP (e.g., network operator or equipment thereof) may allow the [mobile communication devices (“MCD”)] to freely access other networks and/or access other networks at various costs to the user (e.g., at normal cost, higher cost than normal, lower cost than normal[,] or no cost depending on the particular situation).” EX1006, ¶19; EX1007, 9.

122. *Karaoguz* discloses providing notification information to the user of a wireless device, such as where “one or more particular alternative communication networks have been determined to be capable of providing a particular level of communication service quality (e.g., better than presently available from the primary communication network).” EX1006, ¶76; EX1007, 12-13. The notification information “may comprise information to communicate to the user regarding incentives (or disincentives) being offered to the user to utilize an alternative communication network rather than the primary (or native) communication network(s).” EX1006, ¶76; EX1007, 13. For example, where a service provider

“determine[s] that it is advantageous” to “authorize the mobile communication device to access an alternative communication network,” such as where “available communication resources in a primary communication network are limited or predicted to be limited,” the service provider may “provide incentives (e.g., monetary incentive, service plan class incentive, quality incentive, bandwidth priority incentive, coupon incentive, etc.) to the user of the mobile communication device to encourage utilization of the alternative communication network.”

EX1006, ¶83; EX1007, 13-14.

123. *Karaoguz* is analogous art to the '757 patent, which, as previously noted, relates to communication network selection on a wireless communication device, including switching (e.g., offloading) the device from a cellular connection to a Wi-Fi network connection. EX1001, Abstract, 2:8-15. *Karaoguz* is from the same field of endeavor as the claimed invention since, like the '757 patent, it relates to determining “whether access to an alternative communication network is authorized” for a communication device. *Karaoguz*, Abstract, ¶7; EX1007, 9. *Karaoguz*'s communication device may be, for example, a mobile device such as a cellular phone or personal digital assistant with “multimode communication capability” allowing the device to communicate over a variety of networks, including cellular and IEEE 802.11 (Wi-Fi) networks. EX1006, ¶¶15-16, 129; EX1007, 8.

124. *Karaoguz*'s disclosure of wireless network selection based on network usage is also reasonably pertinent to the problems faced by the '757 patent's inventors, who similarly addressed issues relating to offloading from one wireless network to another to alleviate network congestion. For example, *Karaoguz* describes incentivizing a device user to switch to an alternative wireless network when the network service provider "determine[s] that it is advantageous" to "authorize the mobile communication device to access an alternative communication network," such as where "available communication resources in a primary communication network are limited or predicted to be limited." EX1006, ¶83; EX1007, 13. The '757 patent addresses similar problems regarding offering user incentives to switch networks, describing offering a network subscriber an "'incentive offer' that may entice the subscriber to choose one network over another," such as where the network switch "can enable the service provider to reduce load on the cellular network." EX1001, 24:41-43, 25:11-23.

**B. *Karaoguz* Is Entitled to the Priority Date of Its Provisional Application**

125. *Karaoguz* claims priority to U.S. Provisional Application No. 61/091,523 ("*Karaoguz Provisional*," EX1007), filed August 25, 2008. EX1006, p. 1, (field code 60). Based on my review, *Karaoguz* is supported by the written disclosure of the *Karaoguz Provisional* as demonstrated by parallel citations

provided herein. Further, as shown in the table below, the provisional application provides written description support for at least one claim of *Karaoguz*. EX1006, 19 (claim 1); EX1007, 9-12, 15, 17 (claim 2), Fig. 3.

| <i>Karaoguz</i> Claim 1                    | Support in <i>Karaoguz Provisional</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. A communication network comprising:     | <i>Karaoguz Provisional</i> describes mobile communication devices (“MCDs”) connecting to “communication networks” such as cellular and computer communication networks (e.g., WLAN). EX1007, 8, 10 (“A communication service provider (or equipment thereof) may utilize positioning information corresponding to one or more mobile communication devices to determine whether to allow (authorize) access to particular networks.”), 17 (claim 2 reciting “[a] <b>primary communication system</b> comprising ...”). |
| at least one module operable to, at least: | <i>Karaoguz Provisional</i> discloses “at least one module operable to” perform the following claim elements because it discloses that a “mobile communication device may comprise [an] apparatus and/or operate to perform a method that provides position information of                                                                                                                                                                                                                                              |

the portable communication device,” such as through a “positioning apparatus” including “GPS.” EX1007, 10-11. As shown in Figures 3 and 4, the MCD includes, *inter alia*, “signal processing modules” performing a variety of functions. EX1007, 14, 16, Figs. 3, 4.

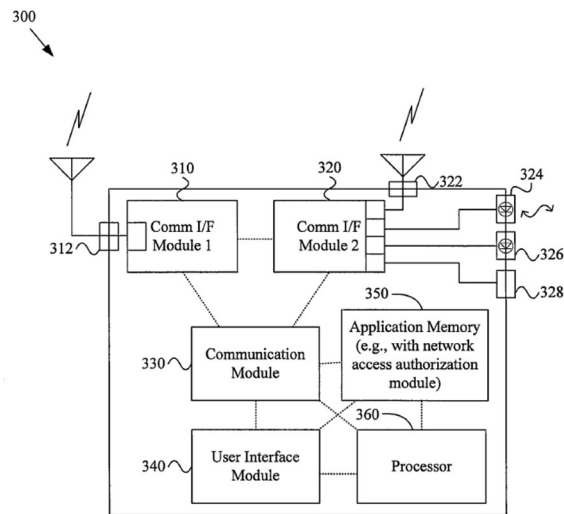


Figure 3

The CSP (service provider) also operates a network “processing positioning information for the mobile communication device” that would include processing modules. EX1007, 9, 17 (claim 2 reciting “[a] **primary communication system comprising at least one module** that operates to ...”).

|                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| determine a position of a mobile communication device serviced by the communication network;                                                                                                  | <i>Karaoguz Provisional</i> discloses that “[t]he position of a mobile communication device may be determined” and that the “mobile communication devices [can be] serviced by [an] operator” (e.g., a communication service provider (CSP)). EX1007, 9-11, 17 (claim 2 reciting <b>“determin[ing a] position of a mobile communication device”</b> ).                                                                                                                                                      |
| determine, based at least in part on the determined position of the mobile communication device, whether the mobile communication device is authorized to access an alternative communication | <i>Karaoguz Provisional</i> discloses that, “based on the determined geographic position of the MCD, the CSP (or network operator or equipment thereof) may determine whether the MCD is allowed to access alternative communication networks.” EX1007, 10, 11, 17 (claim 2 reciting <b>“based, at least in part, on the determined position of the mobile communication device, determin[ing] whether the mobile communication device is authorized to access an alternative communication network”</b> ). |

|                                                                           |                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| network independent<br>of the communication<br>network; and               |                                                                                                                                                                                                                                                                                                                                                                               |
| communicate<br>information regarding<br>said determined<br>authorization. | <i>Karaoguz Provisional</i> discloses that authorization for the MCD to access other networks “may, for example, include communicating authorization information to the MCD and/or the other communication networks.”<br>EX1007, 12, 17 (claim 2 reciting “ <b>communicat[ing] information regarding said determined authorization to the mobile communication device</b> ”). |

**C. Motivation to Combine and Reasonable Expectation of Success**

126. In my opinion, a POSITA would have been motivated to modify *Wynn* to incorporate the user notifications for network-performance incentives described by *Karaoguz*. For example, *Wynn* discloses “targeted advertising” that “may be directed to the digital device 1002 depending on the location of the user or the user’s proximity to goods and services.” EX1005, ¶208. User information, such as device locations, “may then be sold to advertisers to create or direct advertisements.” *Id.*

127. As discussed above, *Karaoguz* discloses providing notification information to a wireless device user, such as where “one or more particular alternative communication networks have been determined to be capable of providing a particular level of communication service quality (e.g., better than presently available from the primary communication network).” EX1006, ¶76; EX1007, 13. The notification information “may comprise information to communicate to the user regarding incentives (or disincentives) being offered to the user to utilize an alternative communication network rather than the primary (or native) communication network(s).” EX1006, ¶76; EX1007, 13. For example, where a service provider “determine[s] that it is advantageous” to “authorize the mobile communication device to access an alternative communication network,” such as where “available communication resources in a primary communication network are limited or predicted to be limited,” the service provider may “provide incentives (e.g., monetary incentive, service plan class incentive, quality incentive, bandwidth priority incentive, coupon incentive, etc.) to the user of the mobile communication device to encourage utilization of the alternative communication network.” EX1006, ¶83; EX1007, 13-14.

128. In my opinion, a POSITA would have been motivated to incorporate *Karaoguz*’s user-notification incentives to incentivize a user to switch to a particular wireless network in *Wynn*’s system, including by presenting the

notification to a user of *Wynn*'s device using *Wynn*'s device software (which includes the "prioritized network selection engine"). A POSITA would have been motivated to do so, for example, due to the benefits the additional network-performance incentives would provide to a wireless network operator, such as alleviating cellular network congestion by moving users from one network (e.g., a current network) to an alternative network. *See also* Claim 1[b.v] in Ground 1; EX1005, ¶170. In that example, a POSITA would have been motivated to incorporate *Karaoguz*'s user notifications to incentivize a user to switch to an alternative wireless network (e.g., by offering a network "quality incentive" or a "bandwidth priority incentive") to encourage a user to switch to the network without forcing the user to do so, which could be detrimental to customer satisfaction and retention. *Karaoguz* confirms this, explaining that its exemplary network-performance incentive is offered when a service provider determines that "available communication resources in a primary communication network are limited or predicted to be limited." EX1006, ¶83; EX1007, 13.

129. In my opinion, a POSITA would also have been motivated to modify *Wynn* to incorporate *Karaoguz*'s user notification of a network-performance incentive (e.g., a bandwidth priority incentive, *Karaoguz* ¶83; EX1007, 13) to benefit digital device users. For example, in return for accepting the notification incentivizing the user to switch to an alternative wireless network, the user would

receive superior network performance in exchange for doing so, thereby receiving a benefit over the user's existing wireless network performance. *See, e.g.*, EX1006, ¶¶76 (describing a notification offering a communication service of an alternative wireless network that is “better than presently available from the primary communication network”), 83 (describing device user incentives, including a “service plan class incentive, quality incentive, [or] bandwidth priority incentive”); *see also* EX1007, 13. The user notification would at least offer the user the choice to switch to the alternative wireless network, including the ability to consider any offered incentives encouraging the user to switch.

130. In my opinion, a POSITA would have had a reasonable expectation of success in modifying *Wynn*'s system. In particular, modifying *Wynn* (including the digital device) to incorporate *Karaoguz*'s user-notification functionality for network-switching incentives would have been well within a POSITA's capability, requiring only routine skill, knowledge, and standard software programming techniques in the field of telecommunications. Such a modification would require merely using known prior-art elements—user notifications on a wireless communication device—according to their known functions to achieve a predictable result. For example, *Wynn* describes providing “targeted advertising” to digital device users. EX1005, ¶208. A POSITA would have had a reasonable expectation of success in extending the targeted advertisement functionality of

*Wynn*'s digital device to additionally include user notifications providing incentives to select an available wireless network, particularly because *Wynn*'s digital device already "retrieves any available information regarding the networks on the [available networks] list" before comparing the networks to determine which network the digital device should connect to. EX1005, ¶172. The user-incentive information provided by *Karaoguz*'s user incentives would be pertinent "available information" regarding an available wireless network that a POSITA would expect a user to consider in making a wireless network selection.

**D. Claim 7: "The wireless end-user device of claim 1, the prioritized network selection engine further configured to provide a user of the wireless end-user device with a notification including an incentive offer to incent the user to connect to one of the available wireless networks."**

131. *Wynn* and *Karaoguz* render obvious claim 7. As discussed above, a POSITA would have been motivated to modify *Wynn*, including digital device 1002 and related functionality, such that the digital device's software (including the "prioritized network selection engine") would provide a digital device user (the claimed "wireless end-user device") with a notification that includes an incentive offer to incentivize the user to connect to one of the available wireless networks.

132. In my opinion, a POSITA would have found it obvious to modify *Wynn*'s device to include *Karaoguz*'s incentive-offer notifications, including where "one or more particular alternative communication networks have been determined

to be capable of providing a particular level of communication service quality (e.g., better than presently available from the primary communication network).”

EX1006, ¶76; EX1007, 13. For example, where a service provider “determine[s] that it is advantageous” to “authorize the mobile communication device to access an alternative communication network,” such as where “available communication resources in a primary communication network are limited or predicted to be limited,” the service provider may “provide incentives (e.g., monetary incentive, service plan class incentive, quality incentive, bandwidth priority incentive, coupon incentive, etc.) to the user of the mobile communication device to encourage utilization of the alternative communication network.” EX1006, ¶83; EX1007, 13. The incentives are provided to a device user in the form of “notification information,” e.g., the system “communicat[es] information causing the mobile communication device to notify a user of the mobile communication device” about the incentive offer. EX1005, ¶76. This notification implemented in *Wynn*’s system is a “notification including an incentive offer to incent the user to connect to one of the available wireless networks” provided to a digital device user by the prioritized network selection engine.

**E. Claim 8: “The wireless end-user device of claim 7, wherein the incentive offer includes a network-performance incentive.”**

133. *Wynn* and *Karaoguz* render obvious claim 8. As discussed above for claim 7, it would have been obvious to modify *Wynn*, including digital device 1002, to incorporate *Karaoguz*’s user notifications offering a performance incentive to switch to an available wireless network. *Karaoguz*’s user notifications include several “network-performance incentives,” including a user notification that the service quality of an available network is “better than presently available from the primary communication network.” EX1006, ¶76; EX1007, 13. Similarly, *Karaoguz*’s notifications may offer a user an incentive to switch to an alternative communication network such as a “service plan class incentive,” a “quality incentive,” or a “bandwidth priority incentive,” each of which is a “network-performance incentive” (as opposed to, e.g., a financial incentive such as a monetary credit or discount for network services offered to a user). EX1006, ¶83; EX1007, 13.

**XII. GROUND 3: CLAIMS 7 AND 8 ARE OBVIOUS OVER *WYNN* IN VIEW OF *DESHPANDE***

**A. Overview of *Deshpande***

134. *Deshpande* discloses “methods and structures for providing wireless network access for mobile users.” EX1008, ¶7. For example, *Deshpande* discloses a “mobile client function” that “is implemented within a communication device to

manage the procurement of network access services for an associated user when, for example, the user is mobile (i.e., away from a tethered access).” *Id.* The mobile client “determines the availability of wireless network access services (i.e., access points) in the vicinity,” “interrogates each of the APs to obtain information relating to the available services,” and “then selects one of the available APs based on the information received from the APs and a user-specific selection criterion” to establish the network connection. *Id.* An exemplary mobile communication device is “a personal digital assistant (PDA), a portable personal computer (e.g., a laptop), [or] a cellular telephone.” EX1008, ¶9. The communication device “is equipped with wireless transceiver functionality that allows the device to establish and maintain a wireless communication link with an external entity,” such as through WiFi (e.g., an IEEE 802.11 network). *Id.*

135. *Deshpande*’s mobile client “can assemble the information gathered about each available provider and then present all or some of this information to the user (e.g., through a display) and allow the user to make the ultimate selection.” EX1008, ¶18. That information may include, for example, “another provider that is now offering a ‘better deal’ than the selected provider (e.g., less expensive, more bandwidth, etc.),” and the mobile client may then cause the wireless device to “switch to this provider.” EX1008, ¶19.

136. *Deshpande* is analogous art to the '757 patent, which, as previously noted, relates to communication network selection on a wireless communication device, including switching (e.g., offloading) the device from a cellular connection to a Wi-Fi network connection. EX1001, Abstract, 2:8-15. *Deshpande* is from the same field of endeavor as the claimed invention since, like the '757 patent, it relates to “communication systems and, more particularly, to techniques and structures for providing wireless network access and services within a communication system.” EX1008, ¶1. For example, like the '757 patent, *Deshpande* discloses a “communication device 10” that can be, e.g., a personal digital assistant or cellular telephone with “wireless transceiver functionality” that is “compatible with any of a number of different wireless standards,” including cellular networks and Wi-Fi networks (e.g., IEEE 802.11 networks). EX1008, ¶9. *Deshpande*’s communication device includes a “mobile client” that determines whether the device should maintain its current network connection or “whether a switch to another provider is warranted.” EX1008, ¶19.

137. *Deshpande*’s disclosure of wireless network selection, which it says may be warranted, e.g., when an alternative network service provider is offering a “better deal” than the communication device’s current network (EX1008, ¶19), is also reasonably pertinent to the problems faced by the '757 patent’s inventors, who similarly addressed issues relating to wireless network selection. For example, the

'757 patent describes similarly incentivizing a user to switch to an alternative wireless network based on an “incentive offer” to do so, e.g., to receive “additional or improved services” on the alternative network. EX1001, 2:56-60.

**B. Motivation to Combine and Reasonable Expectation of Success**

138. In my opinion, a POSITA would have been motivated to modify *Wynn* to incorporate the user notifications of network service providers offering a “better deal,” such as more bandwidth (e.g., a “network-performance incentive”), as described by *Deshpande*. EX1008, ¶19. For example, *Wynn* discloses “targeted advertising” that “may be directed to the digital device 1002[,] depending on the location of the user or the user’s proximity to goods and services.” EX1005, ¶208. User information, such as device locations, “may then be sold to advertisers to create or direct advertisements.” *Id.*

139. As discussed above, *Deshpande* discloses providing notification information to a wireless device user, such as where *Deshpande*’s mobile client 38 on communication device 10 “assemble[s] the information gathered about each available provider and then present[s] all or some of this information to the user (e.g., through a display) and allow[s] the user to make the ultimate selection” regarding which available wireless network to connect to. EX1008, ¶18. The information provided to the user through a display (e.g., a “notification”) includes situations where a communication device is connected to one wireless network and

another network service provider “is now offering a ‘better deal’ than the selected provider (e.g., less expensive, more bandwidth, etc.).” EX1008, ¶19. A POSITA in my opinion would have understood that *Deshpande*’s “better deal” constitutes an incentive to a user to switch to the alternative wireless network, and that an offer to provide “more bandwidth” constitutes a “network-performance incentive” to switch to the alternative network (as opposed to, e.g., a cost incentive such as discounted services).

140. In my opinion, a POSITA would have been motivated to incorporate *Deshpande*’s user-notification incentives in *Wynn*, including by presenting the notification to a user of *Wynn*’s device using *Wynn*’s device software (which includes the “prioritized network selection engine”). A POSITA would have been motivated to do so, for example, due to the benefits the additional network-performance incentives would provide to a wireless network operator, such as alleviating cellular network congestion by moving users from one network (e.g., a current network) to an alternative network. *See also* Claim 1[b.v] in Ground 1; EX1005, ¶170. In that example, a POSITA would have been motivated to incorporate *Deshpande*’s user notifications to incentivize a user to switch to an alternative wireless network (e.g., by offering information about a “better deal” offered by an alternative network, such as “more bandwidth,” EX1008, ¶19) to encourage a user to switch to the alternative network without forcing the user to do

so (which could be detrimental to customer satisfaction and retention). *See also* EX1006, ¶83 (describing a service provider offering a wireless device user an incentive to switch networks when “available communication resources in a primary communication network are limited or predicted to be limited”).

141. A POSITA would also have been motivated to modify *Wynn* to incorporate *Deshpande*’s network-performance incentive (e.g., switching to an alternative network offering a “better deal” of “more bandwidth,” EX1008, ¶19) to benefit a digital device user. For example, in return for accepting the notification incentivizing the user to switch to an alternative wireless network, the user would receive superior network performance (e.g., “more bandwidth”), thereby receiving a benefit over the user’s existing wireless network performance. The user notification would at least offer the user the ability to consider switching to the alternative wireless network, including the option to consider any offered incentives encouraging the user to switch.

142. In my opinion, a POSITA would have had a reasonable expectation of success in making this modification to *Wynn*. In particular, modifying *Wynn* (including the digital device) to incorporate *Deshpande*’s user-notification functionality for network-switching incentives would have been well within a POSITA’s capability, requiring only routine skill, knowledge, and standard software programming techniques in the field of telecommunications. Such a

modification would require merely using known prior-art elements—user notifications on a wireless communication device—according to their known functions to achieve a predictable result.

143. For example, *Wynn* describes providing targeted advertising to digital device users. EX1005, ¶208. A POSITA would have had a reasonable expectation of success in extending the targeted advertisement functionality of *Wynn*’s digital device to additionally include user notifications providing incentives to select one of the available wireless networks, particularly because *Wynn*’s digital device already “retrieves any available information regarding the networks on the [available networks] list” before comparing the networks to determine which network the digital device should connect to. EX1005, ¶172. The user-incentive information provided by *Deshpande*’s notifications (e.g., an alternative wireless network offering a “better deal” such as “more bandwidth,” EX1008, ¶19) would be pertinent “available information” regarding an available wireless network that a POSITA would expect a user to consider in making a wireless network selection.

**C. Claim 7: “The wireless end-user device of claim 1, the prioritized network selection engine further configured to provide a user of the wireless end-user device with a notification including an incentive offer to incent the user to connect to one of the available wireless networks.”**

144. *Wynn* and *Deshpande* render obvious claim 7. As discussed above, a POSITA would have been motivated to modify *Wynn*, including digital device

1002 and related functionality, such that the digital device’s software (including the “prioritized network selection engine”) would provide a digital device user (the claimed “wireless end-user device”) with a notification including an incentive offer to incentivize the user to connect to one of the available wireless networks. For example, a POSITA would have found it obvious to modify *Wynn*’s device to include *Deshpande*’s incentive-offer notifications, including where a communication device is connected to one wireless network and another network service provider “is now offering a ‘better deal’ than the selected provider (e.g., less expensive, more bandwidth, etc.).” EX1008, ¶19. As discussed above, a POSITA would have done so, for example, by implementing *Deshpande*’s user notifications, which “assemble the information gathered about each available provider and then present all or some of this information to the user (e.g., through a display) and allow the user to make the ultimate selection” (EX1008, ¶18), into *Wynn*’s “targeted advertising” system (EX1005, ¶172) for users of digital device 1002.

145. In my opinion, a POSITA would have understood that this notification implemented in *Wynn*’s system is a “notification including an incentive offer to incent the user to connect to one of the available wireless networks” provided to a user of the digital device by the prioritized network selection engine.

**D. Claim 8: “The wireless end-user device of claim 7, wherein the incentive offer includes a network-performance incentive.”**

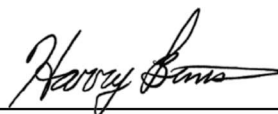
146. *Wynn* and *Deshpande* render obvious claim 8. As discussed above for claim 7, it would have been obvious to modify *Wynn*, including digital device 1002, to incorporate *Deshpande*’s user notifications offering a performance incentive to switch to an available wireless network. *Deshpande*’s user notifications include a “network-performance incentive,” such as where a network service provider “is now offering a ‘better deal’ than the selected provider,” by offering “more bandwidth” to the user of the wireless end-user device. EX1008, ¶19.

### **XIII. CONCLUSION**

147. For the reasons set forth above, it is my opinion that claims 1-10 of the '757 patent are unpatentable in view of the prior art.

148. In signing this declaration, I understand it will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I understand I may be subject to cross-examination in this case, and that any cross-examination will take place in the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

149. 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 further, that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

By: 

Harry Bims, Ph.D.

Dated: October 22, 2025