

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

RFCYBER CORP.,
Patent Owner.

IPR2022-00413
Patent 9,240,009 B2

Before KEVIN F. TURNER, PATRICK R. SCANLON, and
KEVIN W. CHERRY, *Administrative Patent Judges*.

CHERRY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

This is a Final Written Decision in an *inter partes* review challenging the patentability of claims 1–17 (collectively, “the challenged claims”) of U.S. Patent No. 9,240,009 B2 (“the ’009 patent,” Ex. 1001). We have jurisdiction under 35 U.S.C. § 6. We issue this Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner demonstrates, by a preponderance of the evidence, that claims 1–17 are unpatentable.

A. *Procedural History*

Apple Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review under 35 U.S.C. § 311. RFCyber Corp. (“Patent Owner”) filed a Preliminary Response (Paper 9, “Prelim. Resp.”). On July 21, 2022, we instituted an *inter partes* review of the challenged claims. Paper 12 (“Institution Decision” or “Dec.”).

Following institution, Patent Owner filed a Response (Paper 16, “PO Resp.”), Petitioner filed a Reply (Paper 23, “Reply”), and Patent Owner filed a Sur-reply (Paper 25, “Sur-reply”).

We heard oral argument on April 21, 2023, and the record includes a transcript of the argument. Paper 32 (“Tr.”).

B. *Related Matters*

The parties identify the following district-court proceedings as related matters involving the ’009 patent: *RF Cyber Corp. v. Apple, Inc.*, Case No. 6:21-cv-00916-ADA (W.D. Tex.); *RF Cyber Corp. v. Google LLC*, No. 2:20-cv-00274 (EDTX); *RF Cyber Corp. v. LG Electronics, Inc.*, No. 2:20-cv-00336 (EDTX); and *RF Cyber Corp. v. Samsung Electronics Co.*, 2:20-cv-00335 (EDTX). Pet. 2–3; Paper 6, 1 (Patent Owner’s Mandatory Notices).

The parties also identify the following Board proceedings involving petitioner Google LLC and related patents: IPR2021-00954 (U.S. Patent No. 8,448,855 B1); IPR2021-00955 (U.S. Patent No. 9,189,787 B1); IPR2021-00956 (U.S. Patent No. 9,240,009 B2); IPR2021-00957 (U.S. Patent No. 8,118,218 B2); IPR2021-00978 (Patent No. 8,448,855); IPR2021-00979 (Patent No. 8,118,218); IPR2021-00980 (Patent No. 9,189,787); PGR2021-00028 (U.S. Patent No. 10,600,046 B2); and PGR2021-00029 (U.S. Patent No. 10,600,046 B2). Pet. 2–3; Paper 6, 1. Petitioner also identifies the following Board proceedings involving the '009 patent or related patents, filed by Samsung Electronics America, Inc. et al.: IPR2021-00978 (U.S. Patent No. 8,448,855 B1); IPR2021-00979 (U.S. Patent No. 8,118,218 B2); IPR2021-00980 (U.S. Patent No. 9,189,787 B1); and IPR2021-00981 (U.S. Patent No. 9,240,009 B2). Pet. 3–4; Paper 4, 2–3.

C. Real Parties in Interest

Petitioner identifies its real party in interest as Apple Inc. Paper 11 (Petitioner's Updated Mandatory Notice), 2.

Patent Owner identifies RFCyber Corp. as its real party in interest. Paper 6, 1.

D. The '009 Patent (Ex. 1001)

The '009 patent relates to commerce over networks, and more specifically, techniques for personalizing a secure element and provisioning an application such as an electronic purse that can be used in portable devices configured for both electronic commerce (a.k.a., e-commerce) and mobile commerce (a.k.a., m-commerce). Ex. 1001, code (57), 1:18–24.

The '009 patent states that there is a “need to provide techniques to personalize a secure element in a contactless smart card or an NFC (Near

Field Communication)-enabled mobile device so that such a device is so secured and personalized when it comes to financial applications or secure transactions.” *Id.* at 2:10–14. Although closed systems—such as smart card technology—existed, they were “difficult to be expanded into other areas such as e-commerce and m-commerce” because “stored values and transaction information are stored in data storage of each tag that is protected by a set of keys,” which keys must be “delivered to the card for authentication before any data can be accessed during a transaction.” *Id.* at 1:33–40. According to the ’009 patent, this required delivery of keys “makes systems using such technology difficult to be expanded to an open environment such as the Internet for e-commerce and/or wireless networks for m-commerce as the delivery of keys over a public domain network causes security concerns.” *Id.* at 1:40–44. The ’009 patent purports to overcome the limitations of the prior art by providing “techniques for personalizing secure elements in NFC devices to enable various secure transactions over a network (wired and/or wireless network).” *Id.* at 2:31–34.

Figure 1A, reproduced below, provides a schematic view of one embodiment of the ’009 patent.

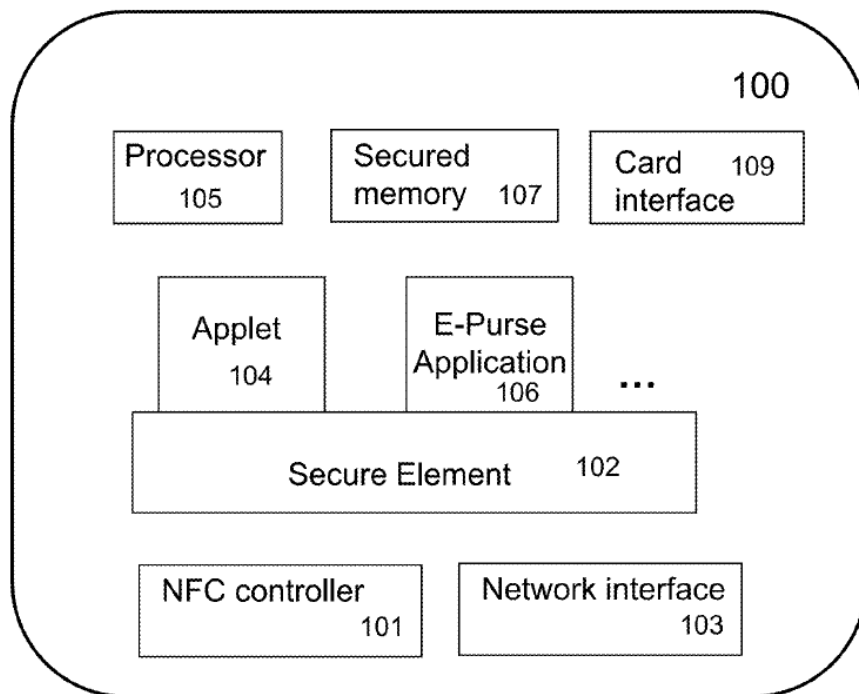


FIG. 1A

FIG. 1A shows a simplified architecture diagram of computing device 100 according to one embodiment of the '009 patent. Ex. 1001, 4:35–36.

As shown in Figure 1A, mobile device 100 includes near field communication (NFC) controller 101 that enables device 100 to interact with another device wirelessly to exchange data with. *Id.* at 6:40–42. A user may use mobile device 100 as an e-purse or a wallet to pay for a purchase or an admission. *Id.* at 6:43–44. In operation, the e-purse is controlled by secure element (SE) 102. *Id.* at 6:44–46. SE 102 may take the form of a smart card, an integrated circuit (IC), or a software module, upgradable by overwriting some of all of the components. *Id.* at 6:59–61. “In one embodiment, the SE 102 is a tamper proof Smart Card chip capable to embed smart card-grade applications (e.g., payment, transport ...) with the required level of security and features.” *Id.* at 6:61–64.

According to the '009 patent, “SE 102 enables mobile device 100 to perform financial transaction, transport ticketing, loyalty, physical access control, and other exciting new services in a secured manner.” *Id.* at 6:46–49. To offer such services, the SE 102 is configured to support various applets, applications or modules (e.g., Applet 104 and E-Purse Application 106). *Id.* at 6:49–51.

When a mobile device is first purchased by or delivered to a customer, SE 102 in the mobile device is installed with a set of default keys (e.g., an Issuer Security Domain (ISD) key set by the SE manufacturer). *Id.* at 6:55–58. In one embodiment, SE 102 is or includes a software module loaded in secured memory space 107 in mobile device 100. *Id.* at 7:7–9. The software module may be updated by downloading updating components from a designated server using network interface 103 (e.g., a 3G network or an LTE network) in mobile device 100. *Id.* at 7:9–12.

SE 102 needs to go through a personalization or provisioning process before it can be used. *Id.* at 7:13–18. According to one embodiment, the provisioning is performed over the air (“OTA”) to cause the SE to be personalized while installing an application or enabling a service (i.e., application installation and personalization). *Id.* at 7:18–22. Applications are available for an NFC-enabled mobile device to download from a server or a TSM portal—a TSM, standing for Trusted Service Management, is a collection of services. *Id.* at 7:32–36.

The provisioning process in the preferred embodiment proceeds as follows. First, the customer registers his/her mobile phone via a server (often TSM web portal). *Id.* at 7:61–62. The TSM server is configured to push a universal resource identifier (“URI”) of a provisioning manager to the

registered mobile phone. *Id.* at 7:62–65. The customer can download the provisioning manager into the mobile device and start the personalization process. *Id.* at 7:65–66. The server uses information from the device, such as its serial number, to confirm that the device is genuine. *Id.* at 8:4–20. Once verified, the device then communicates and is registered with the server. *Id.* at 8:20–27. Once the device becomes part of the system, various services or data may be communicated to the device via the network. *Id.* at 8:27–29. As part of the personalization process, the server requests device information of the SE, including the Issuer Security Domain information for this SE. *Id.* at 8:29–42.

The device information is used to facilitate the generation of a set of keys. *Id.* at 8:63–65. The server is configured to establish a secured channel using the default ISD between its hardware security module (HSM) and the SE. *Id.* at 8:65–67. The server is also configured to compute a derived key set for the SE. *Id.* at 8:67–9:1. A master ISD key may be housed in a hardware security module (HSM) associated with the server or in a local HSM of the SE issuer. *Id.* at 9:2–9. If the master ISD key is housed in the HSM of the server, the server is configured to instruct the HSM to compute the derived key set. *Id.* at 9:9–11. If the master ISD key of the SE issuer is in a local HSM of the SE issuer, the server is configured to interact with the remote HSM to retrieve the keys. *Id.* at 9:13–16.

The set of keys is securely delivered to the SE. *Id.* at 9:18. The set of keys is thus personalized to the SE and will be used for various secured subsequent operations or services with the device. *Id.* at 9:18–21.

SE 102 of Figure 1A may be perceived as a preload operating system in a Smart card, providing a platform for PIN management and security channels

(security domains) for card personalization. *Id.* at 9:62–65. According to the '009 patent, “SE 102 combines the interests of smart card issuers, vendors, industry groups, public entities and technology companies to define requirements and technology standards for multiple applications running in the smart cards.” *Id.* at 9:65–10:2. As an example, the '009 patent describes one module 104, referred to as an e-purse security, that defines a set of protocols that enable micro payment transactions to be carried out in both wired and wireless environments. *Id.* at 10:3–6. With an electronic purse (a.k.a., e-purse) stored on a smart card, a set of keys (either symmetric or asymmetric) is personalized into the e-purse after the e-purse is issued. *Id.* at 10:6–9. During a transaction, the e-purse uses a set of respective keys for encryption and MAC computation in order to secure the message channel between the e-purse and a SAM (Security Authentication Module) or backend servers. *Id.* at 10:9–13. During the personalization or provisioning process described above, the single functional card access keys (or its transformation) are personalized into the e-purse with the e-purse transaction keys. *Id.* at 10:13–18.

E. Illustrative Claim

Petitioner challenges claims 1–17 of the '009 patent. Pet. 1. Of the challenged claims, claims 1 and 14 are independent. Claim 1, reproduced below, is illustrative of the subject matter recited in the challenged claims (bracketing added).

[1.PREAMBLE] A mobile device for conducting a
secured transaction over a network, the mobile
device comprising:

[1a] a network interface;

[1b] an interface to receive a secure element;

[1c] a memory space for storing at least a module and an application downloaded from the network;

[1d] a processor coupled to the memory space and configured to execute the module to perform operations including:

[1di] sending to a server via the network interface an identifier identifying the application together with device information of a secure element, [1dii] wherein the application is downloaded from the network in the mobile device;

[1diii] establishing a secured channel between the secure element and the server using a key set installed on the secure element, [1div] wherein the server is configured to prepare data necessary for the application to function as designed on the mobile device; and

[1dv] receiving the data from the server to associate the application with the secure element, [1dvi] wherein the application subsequently functions in conjunction with the secure element.

Id. at 24:16–36.

F. Testimonial and Prior Art Evidence

Petitioner submits the following evidence:

Evidence	Exhibit No.
Declaration of Gerald W. Smith (“Smith Decl.”)	1003
Dua, US 2006/0165060 A1 (published July 27, 2006, filed Jan. 21, 2005) (“Dua”)	1004
GlobalPlatform Card Specification Version 2.1.1 (March 2003) (“GlobalPlatform” or “GP”)	1006
Smart Card Handbook Third Edition, by Wolfgang Rankl and Wolfgang Effing (2003) (“Smart Card Handbook”)	1008
U.S. Patent Application Publication No. 2006/0174352 A1 (published August 3, 2006, filed January 31, 2006) (“Thibadeau”)	1041
Miguel Gomez Deposition Transcript, dated	1045

Evidence	Exhibit No.
February 7, 2023 (“Gomez Tr.”)	
Supplemental Declaration of Gerald W. Smith (“Smith Supp. Decl.”)	1046

Patent Owner submits the following testimonial evidence:

Evidence	Exhibit No.
Declaration of Miguel Gomez (“Gomez Decl.”)	2007
Deposition Transcript of Gerald W. Smith, taken November 14, 2022 (“Smith Tr.”)	2009

G. Asserted Unpatentability Challenges

We instituted an *inter partes* review of the challenged claims on the following grounds of unpatentability:

Claims Challenged	35 U.S.C. §¹	References/Basis
1–6, 13–17	103(a)	Dua, GlobalPlatform
7–10	103(a)	Dua, GlobalPlatform, Smart Card Handbook
11–12	103(a)	Dua, GlobalPlatform, Smart Card Handbook, Thibadeau

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. The ’009 patent claims benefit of a September 24, 2006, filing date, which is before the effective date of the applicable AIA amendments. Ex. 1001, (63). Petitioner states that the “Board may presume that the effective filing date” to “resolve Petitioner’s challenge.” Pet. 7. Thus, we refer to the pre-AIA version of 35 U.S.C. § 103. Our decision would be the same were we to apply the AIA version of the statute.

II. ANALYSIS

A. *Legal Standards*

To prevail in its challenge, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2020). A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Subsumed within the *Graham* factors is the requirement that the skilled artisan would have had a reasonable expectation of success in combining the prior art references to achieve the claimed invention. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007). “Obviousness does not require absolute predictability of success. . . . [A]ll that is required is a reasonable expectation of success.” *In re O’Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988).

Moreover, “[the] combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416. “If a person of ordinary skill can implement a predictable variation, . . . § 103 likely bars its patentability.” *Id.* at 417.

B. Level of Ordinary Skill in the Art

We consider the asserted grounds of unpatentability in view of the understanding of a person of ordinary skill in the art. In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Relying on the declaration testimony of Mr. Smith, Petitioner contends that an ordinarily skilled artisan for the ’009 patent “would have been knowledgeable regarding mobile payment methods and systems pertinent to the ’009 patent.” Pet. 9. Petitioner also contends that an ordinarily skilled artisan “would have had at least a bachelor’s degree in computer science, computer engineering, electrical engineering or an equivalent, and about one year of professional experience relating to mobile payment technology, which would have exposed them to concepts like GlobalPlatform and smart cards” and that “[I]ack of professional experience [can] be remedied by additional education, and vice versa.” *Id.* (citing Ex. 1003 (Smith Decl.) ¶¶ 28–29).

In its Patent Owner Response, Patent Owner asserts that “[a] person of ordinary skill in the art would have a Bachelor’s degree in Computer Science, Computer Engineering, or Applied Mathematics, with 2 or more years of academic or industry experience in computer security, network

security or mobile payment technology.” PO Resp. 7 (citing Ex. 2007 (Gomez Decl.) ¶¶ 32-33).

In its Reply, Petitioner argues that Patent Owner removes the requirement that a person of ordinary skill in the art have mobile payment experience. Reply 2. Petitioner asserts that experience with mobile payments is required for a person of ordinary skill in the art. *Id.* at 3 (citing Ex. 1046 (Smith Supp. Decl.) ¶¶ 4–10).

Patent Owner further argues that “Patent Owner’s proposal, which has a greater experience requirement than Petitioner’s, addresses that the claimed arrangement of security features, such as ‘device information of a secure element’ and ‘secured channel[s] between the secure element and the server using a key set installed on the secure element,’ among others.” Sur-reply 3.

Here, the parties’ definitions differ in one significant way. Petitioner requires one year of more specific experience, i.e., mobile payment experience, while Patent Owner requires more experience, but that experience can be more general related to computer and network security. We agree with Petitioner that mobile payment technology is an important aspect of the claimed invention and should be included in the definition. However, we also find that Petitioner’s definition is flexible enough to address the concerns of Patent Owner because, as the definition explains “[l]ack of professional experience [can] be remedied by additional education, and vice versa.” Petitioner’s articulation of the level of ordinary skill in the art is consistent with the ’009 patent and the asserted prior art,

and we apply it in our obviousness evaluations below.² *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art, itself, can reflect appropriate level of ordinary skill in art).

C. Claim Construction

In an *inter partes* review, we construe claims “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Furthermore, we expressly construe the claims only to the extent necessary to resolve the issues presented in this case. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). We find that no express constructions are necessary for this decision.

² As for Petitioner’s argument that we should disregard Mr. Gomez’s testimony entirely because he lacks sufficient experience in mobile payment technology, Reply 2–3, we decline to do so. Mr. Gomez testifies that he has extensive experience with online and mobile commerce based on his professional experience developing hardware, software, and protocols used in online and mobile commerce. *See* Ex. 1045, 14:1–24. Given the flexible definition of a person of ordinary skill in the art, we find Mr. Gomez’s lengthy experience sufficient for him to qualify to testify. However, although we will not dismiss his testimony out of hand, we will still consider each part of his testimony and the reasoning and support he provides before assigning weight to that testimony. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15 (PTAB Aug. 24, 2022) (precedential).

D. Overview of the Prior Art

1. Dua (Ex. 1004)

Dua is a published U.S. patent application entitled “Method and Apparatus for Managing Credentials Through a Wireless Network.” Ex. 1004, code (54). Dua discloses a “system and methodology for conducting financial and other transactions using a wireless device.” *Id.* at Abstract. Dua’s wireless device includes a “wallet application” that receives, stores, manages, and transmits multiple payment, identification, and other confidential information electronically. *Id.* ¶ 41. Card issuers like banks or merchants can develop custom “extensions” which are installed in the wallet application and stored in an embedded smart card. *Id.* ¶¶ 289, 295. One example of an extension is a stored-value card extension for paying subway fare. *Id.* ¶¶ 290, 293. The stored value card extension “need[s] to be programmed” to support “over-the-air reload,” i.e., wireless funding of the e-purse. *Id.* ¶ 293.

2. GlobalPlatform (Ex. 1006)

GlobalPlatform Card Specification version 2.1.1 describes the “[s]pecifications that shall be implemented on GlobalPlatform smart cards.” Ex. 1006, 16. GlobalPlatform describes its own security architecture and commands for use in installing and personalizing applications on GlobalPlatform cards. Ex. 1006, 65–67, 88–90. GlobalPlatform is a “hardware-neutral,” “vendor-neutral,” and “Application-independent” “chip card standard” which “provides a common security and card management architecture.” Ex. 1006, 16; Ex. 1008, 290. “GlobalPlatform is intended to run on top of any secure, multi-application card runtime environment” including Java Card. Ex. 1006, 16 (§ 1), 29 (§ 3.1). GlobalPlatform

specifies the card architecture, security architecture, Life Cycle models for smart cards and their Applications, the Card Manager, Security Domains for key management and establishing Secure Channels. Ex. 1003 ¶¶ 51–63. GlobalPlatform describes sequences of commands for installing, personalizing, and deleting applications on multi-application smart cards. Ex. 1006, 65–67, 88–90.

3. *Smart Card Handbook (Ex. 1008)*

Smart Card Handbook is a textbook by Wolfgang Rankl and Wolfgang Effing published by John Wiley & Sons. Among the many things it explains about smart cards, it describes card management systems that employ databases for holding data related to unique smart cards and data on the cards themselves. Ex. 1008, 251, 301, 600. Smart Card Handbook also discusses managing security keys on smart cards. Ex. 1008, 202–208. Smart Card Handbook explains that one technique for generating keys during personalization includes the use of a “card number” or “chip number” to generate an encryption key by a security module to secure the personalization data transmitted to the card. *Id.* at 645.

4. *Thibadeau (Ex. 1041)*

Thibadeau is a published U.S. patent application entitled “Method and Apparatus for Providing Versatile Services on Storage Devices.” Ex. 1041, (54). Thibadeau describes a way of storing “virtual smart cards” managed by “Card Operating System,” software “needed to interface into” standardized card environments such as GlobalPlatform-based smart cards.

E. Unpatentability Grounds

1. Alleged Obviousness of Claims 1–6 and 13–17 over Dua and GlobalPlatform

Petitioner contends that claims 1–6 and 13–17 of the '009 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Dua in view of GlobalPlatform. Pet. 14–52. Patent Owner opposes. PO Resp. 8–24; Sur-reply 6–19. Having considered the arguments and evidence before us, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–6 and 13–17 would have been obvious over Dua in view of GlobalPlatform.

a) Claim 1

(1) Petitioner's Contentions

Petitioner contends that Dua discloses “[a] mobile device for conducting a secured transaction over a network, the mobile device comprising” (the [Preamble]) and “a network interface” (limitation [1a]) of claim 1. *See* Pet. 16–17 (citing Ex. 1004 (Dua) ¶¶ 41, 2, 15, 107, 313, 405, Figs. 1, 3, 8 (wireless devices 200, 400, 800 and wireless device interfacing with communications tower); Ex. 1003 (Smith Decl.) ¶¶ 107–109, 111). Petitioner relies on the combination of Dua and GlobalPlatform to account for “an interface to receive a secure element” (limitation [1b]), “a memory space for storing at least a module and an application downloaded from the network” (limitation [1c]), and “a processor coupled to the memory space and configured to execute the module to perform operations” (limitation [1d]). Pet. 17–21 (citing Ex. 1004 ¶¶ 7, 8, 14, 215, 293, 295, 309; Ex. 1003 ¶¶ 113–115, 118–124, 128–130; Ex. 1006 (GlobalPlatform), 29 (§ 3.2), 31 (§ 3.5), 39 (5.1.1.1), 62 (§ 6.4.1), 65 (§ 6.4.1.2); Ex. 1008 (Smart Card

Handbook), 53, 55, 735–786, 963; Ex. 1012³, 1–2, 9; Ex. 1042, 168–69 (’009 patent File History)). Petitioner also relies on Dua and GlobalPlatform to account for the operations performed by the processor (limitations [1di]–[1dvi]). *Id.* at 21–30. In particular, Petitioner contends that Dua in view of GlobalPlatform accounts for the operations of “sending to a server via the network interface an identifier identifying the application together with device information of a secure element” ([1di]). *Id.* at 21–23 (citing Ex. 1004 ¶¶ 41, 160, 179, Fig. 3; Ex. 1006, 18 (§ 1.3), 20 (§ 1.4), 81, 92–93 (§ 7.6.2), 98 (§ 7.7.4); Ex. 1003 ¶¶ 132–136; Ex. 1008, 237, 257, 600, 650; Ex. 1012, 6). Petitioner argues that Dua, either alone or in combination with GlobalPlatform, accounts for the operation of “wherein the application is downloaded from the network in the mobile device” (limitation [1dii]). *Id.* at 23–24 (citing Ex. 1004 ¶¶ 104, 215, 289, 293; Ex. 1003 ¶ 138; Ex. 1008, 650; Ex. 1014, 11 (ETSI Technical Specification 102 226 v6.12.0 (Sept. 2005))). Petitioner asserts that the combination of Dua and GlobalPlatform accounts for the operation of “establishing a secured channel between the secure element and the server using a key set installed on the secure element” (limitation [1diii]). *Id.* at 24–26 (citing Ex. 1004 ¶¶ 201–205, 247; Ex. 1003 ¶¶ 98–105, 141–145; Ex. 1006, 29, 40, 53, 54, 218). Petitioner contends that Dua, either alone or in combination with GlobalPlatform, accounts for the operation of “wherein the server is configured to prepare data necessary for the application to function as designed on the mobile device” (limitation [1div]). *Id.* at 26–27 (citing Ex. 1004 ¶¶ 26, 57, 58, 148, 215, 297; Ex. 1003 ¶¶ 147, 148; Ex. 1006, 44, 65–66, 88, 102). Finally,

³ SmartMX, P5CT072 Secure Dual Interface PKI Smart Card Controller, Short Form Specification (Rev. 1.3 – 4 October 2004) (Ex. 1012).

Petitioner relies on the combination of Dua and GlobalPlatform to account for the last two operations, “receiving the data from the server to associate the application with the secure element” (limitation [1dv]) and “wherein the application subsequently functions in conjunction with the secure element” (limitation [1dvi]). *Id.* at 28–30 (citing Ex. 1004 ¶¶ 18, 22, 26, 180, 215, 247, 290, 293, 295, 296, 309, 318, 378; Ex. 1003 ¶¶ 148, 150–152, 155; Ex. 1006, 30, 65, 88, 89, 102).

Petitioner argues that a person of ordinary skill would have been motivated to combine Dua and GlobalPlatform because Dua does not provide conventional smart card implementation details, but does refer to standards being developed that a person of ordinary skill would recognize as including GlobalPlatform. Pet. 14–16. Petitioner submits that “GlobalPlatform discloses ‘a hardware-neutral, vendor-neutral, Application-independent [smart] card management specification’ that provides a security architecture that protects the ‘structure and function of cards within the GlobalPlatform system’ for the life of the card—thus providing a ‘secure element’ as claimed.” *Id.* at 15 (citing Ex. 1006, 16, 32). Petitioner further notes that “Dua’s ‘wallet application should meet standards defined by card organizations,’ and GlobalPlatform was specifically developed by such card organizations.” *Id.* (citing Ex. 1004 ¶ 525; Ex. 1006, 16; Ex. 1003 ¶¶ 99–101). Thus, Petitioner contends that a person of ordinary skill would have been motivated and “would find it obvious to employ the well-known GlobalPlatform system with Dua’s smart cards.” *Id.* Petitioner provides another rationale that, because Dua describes using “a Java platform and Java applets” for wireless devices, the ordinary artisan would look to the JavaCard implementation described in GlobalPlatform, because

“GlobalPlatform ‘has primarily become the *de facto* standard for loading and managing Java-based applications with the Java Card operating system.[’]” Pet. 15–16 (citing Ex. 1008, p. 290).

Petitioner further notes that Dua discloses the use of a Java platform and Java applets with its wireless devices, which a person of ordinary skill in the art would have recognized as being a reference to Java Card. *Id.* (Ex. 1004 ¶¶ 195, 500; Ex. 1003 ¶ 102). Petitioner submits that GlobalPlatform is designed to be compatible with Java Card. *Id.* at 16 (citing Ex. 1006, 24, 29). Petitioner argues that “GlobalPlatform ‘has primarily become the *de facto* standard for loading and managing Java-based applications with the Java Card operating system.’” *Id.* (citing Ex. 1008, 290). Petitioner argues that this “further confirms a [person of ordinary skill in the art] would be motivated to and would find it obvious to use GlobalPlatform with Dua’s smart cards.” *Id.*

(2) *Patent Owner’s Arguments*

Patent Owner raises several arguments regarding Petitioner’s contentions. PO Resp. 8–24. First, Patent Owner argues that that person of ordinary skill would not have combined Dua with GlobalPlatform. *Id.* at 8–18. Second, Patent Owner asserts that combination fails to account for the claimed “secure element.” *Id.* at 18–20. Finally, Petitioner contends that Dua fails to account for the claim limitation “wherein the server is configured to prepare data necessary for the application to function as designed on the mobile device.” *Id.* at 20–24.

(3) *Analysis*

With respect to the undisputed limitations, we have reviewed Petitioner’s contentions and evidence and find them sufficient. Therefore,

we adopt Petitioner’s contentions as our own. *See* Pet. 16–17, 18–26, 28–30. We focus our analysis on the motivation to combine and disputed limitations.

(a) *Motivation to Combine*

Patent Owner disputes that Petitioner has shown adequately that a person of ordinary skill in the art would have been motivated to combine Dua with GlobalPlatform. *See* PO Resp. 8–18. Patent Owner argues that Petitioner “identifies no deficiencies in Dua that would motivate a [person of ordinary skill in the art] to import GlobalPlatform,” because “Dua already provides a complete system that already includes the same functionality [Petitioner] borrows from GlobalPlatform.” *Id.* at 8–9. Patent Owner contends that Petitioner fails to explain why a person of ordinary skill would discard Session Initiation Protocol or (“SIP”), which Dua describes as “an important aspect of the present invention,” in favor of the protocol of GlobalPlatform. *Id.* at 9–10. Patent Owner argues that Petitioner’s expert does not have expertise in the field of network protocols, and that the field was “extremely unpredictable and that no solutions were obvious.” *Id.* at 11–12. Patent Owner also asserts that Dua’s discussion of “interoperability” is related to chip cards and terminals, not “card management architecture,” which is the focus of GlobalPlatform. *Id.* at 15–16. As for Petitioner’s reliance on Dua’s statement that a “wallet application should meet standards defined by card organizations,” Patent Owner contends that GlobalPlatform “is not a card organization,” but rather operates across “multiple industries.” *Id.* at 16. According to Patent Owner, “GlobalPlatform therefore is not payment-related, it is instead designed to provide multi-application smart cards.” *Id.* Thus, Patent Owner argues that a person of ordinary skill in the

art, “reading Dua, would not look to GlobalPlatform based on Dua’s references to standards and specifications.” *Id.* at 17. Patent Owner further argues that Dua’s reference to Java would not motivate a person of ordinary skill to look GlobalPlatform. *Id.*

A motivation to combine may be found “explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018) (quoting *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1354 (Fed. Cir. 2013)).

We find that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have been motivated to combine Dua and GlobalPlatform. To begin with, we believe Patent Owner overstates the importance of SIP to Dua. Although Patent Owner correctly quotes some statements in Dua that the use of SIP is “an important aspect of the present invention,” Dua also states that

While the use of SIP for such purposes is preferred, alternative application protocols may be used in lieu of SIP while still remaining within the spirit and scope of the present invention.

Ex. 1004 ¶ 50. Patent Owner labels this statement as a “formality.” PO Resp. 10. We disagree with Patent Owner that this language is a mere formality or boilerplate. Unlike the examples collected in the case cited by Patent Owner⁴, Dua’s statement is specific and identifies one aspect, the use

⁴ *SandBox Logistics LLC v. Proppant Express Investments, LLC*, 813 Fed. Appx. 548, 553 n.8 (Fed. Cir. 2020) (non-precedential) (collecting cases) (identifying statements such as “the embodiments of the ‘present invention’

of SIP, as preferred, but that alternative application protocols may be used. Thus, we do not agree that, even replacing SIP, as Patent Owner characterizes the Petition, would “destroy the basic objective” of Dua.

Even if Patent Owner were correct about its characterization that SIP is “essential,” Petitioner has still shown a motivation to combine because the proposed combination does not “discard” SIP as Patent Owner contends. In particular, Patent Owner asserts that Petitioner “argues that a [person of ordinary skill] would discard all of Dua’s SIP teachings and use GlobalPlatform’s system for personalization instead.” PO Resp. 12.

However, we agree with Petitioner that this mischaracterizes the proposed combination. *See* Reply 6–7. As the Petition states, Petitioner relies on Dua’s SIP session to establish the initial connection between the endpoints (between the smart card and a server) and download the application and send application identifying information to the server. *See* Pet. 22 (describing GlobalPlatform’s receipts transmitted “via a wireless SIP session”), 23 (downloading extensions “during a SIP session”). As Mr. Smith credibly testifies, “Dua teaches utilizing the SIP protocol to connect endpoints,” and “Dua’s SIP networking protocol for connecting endpoints functions like a ‘pipe’ to connect the two endpoints (e.g., smart card and server or host such as Dua’s WCM) together over a network.” Ex. 1046 (Smith Supp. Decl.)

¶ 15. Moreover, as Mr. Smith clarifies in his Supplemental Declaration, “Dua’s SIP protocol constructs the connection between endpoints, and GlobalPlatform establishes a secure channel within that connection for smart

are ‘not intended, in any way, to limit the scope of the present invention[,]’ or “[t]he foregoing disclosure and description of the present invention is illustrative and explanatory thereof” as insufficient).

card specific communications.” Ex. 1046 ¶ 14; *see also* Pet. 24–26 (discussing the use of GlobalPlatform to create the secure channel). We find that Mr. Smith credibly testifies that “a [person of ordinary skill in the art] would have understood that in the combination, GlobalPlatform’s processes relying on the exchange of Application Protocol Data Unit (“APDU”) messages would be sent over Dua’s SIP endpoint-to-endpoint connection (“pipe”) because, (1) SIP is derived from HTTP, (2) APDUs are the standard messaging protocol for smart cards, and (3) it was known to transmit APDUs over HTTP.” Ex. 1046 ¶ 16. Mr. Smith supports this assertion with detailed testimony relying on extensive citations to Dua, Ex. 1046 ¶ 17, GlobalPlatform, *id.* ¶¶ 18, 20, Chen⁵ (*id.* ¶ 19), and Thibadeau, *id.* ¶ 21. We find this testimony was reasoned, detailed, and entitled to substantial weight. Thus, we find that Petitioner has shown that in the proposed combination Dua’s SIP protocol would not be “discarded,” but rather, would remain an integral part of the combination. *See* Ex. 1046 ¶¶ 14–21.

Patent Owner argues that this is new argument, contends that Mr. Smith is “admittedly not an expert in this area,” asserts this argument “pay[s] lip service to Dua’s SIP-based connections based on phone numbers,” and argues SIP and GlobalPlatform are “incompatible.” Sur-reply 9–10. We do not find any of these arguments persuasive. First, we disagree with Patent Owner that this is a new argument. “Parties are not barred from elaborating on their arguments on issues previously raised.” *Chamberlain Grp., Inc. v. One World Techs., Inc.*, 944 F.3d 919, 925 (Fed. Cir. 2019). Here, the Petition explained that SIP session was retained in the

⁵ Zhiquan Chen, *Java Card Technology for Smart Cards, Architecture and Programmer’s Guide* (Ex. 1049, Chen).

proposed combination. *See* Pet. 22–24. In his Supplemental Declaration, Mr. Smith explains precisely how that session would be used together with the GlobalPlatform-compliant smart card. *See* Ex. 1046 ¶¶ 14–21. This explanation responds directly to Patent Owner’s argument that the Petition “discards” the use of SIP, which Patent Owner contends would be contrary to Dua’s teachings. PO Resp. 8–12. Thus, we will consider the argument. Second, Patent Owner asserts that Mr. Smith is not an expert in networking, so we should not credit his testimony on the use of SIP in the combination. *See* PO Resp. 11; Sur-reply 8–9. We disagree. There is no dispute that, at the very least, Mr. Smith meets either party’s definition of a person of ordinary skill in the art. Mr. Smith’s testimony regarding the use of SIP in combination with GlobalPlatform is detailed and logical and supported by extensive citations to a number of prior art references. *See* Ex. 1046 ¶¶ 14–22. Patent Owner neither identifies any specific errors in Mr. Smith’s analysis nor points to any evidence that would undermine his analysis. Accordingly, we find that Mr. Smith’s testimony is not undermined by his alleged lack of expertise in networking protocols.

Third, we do not agree that Petitioner’s argument “pay[s] lip service” to Dua’s use of SIP or that Petitioner’s argument is inconsistent with the Petition’s mapping for limitations [1div] and [1dv]. Rather, we find that the proposed combination makes active use of SIP, and there is no inconsistency with Petitioner’s mapping for limitations [1div] and [1dv], because the proposed combination makes use of the GlobalPlatform security domain and key set *within* the SIP session. *See* Ex. 1046 ¶¶ 14–21. Finally, as for Patent Owner’s arguments regarding an alleged “incompatibility” between GlobalPlatform and SIP, Patent Owner cites no evidence to support this

contention, and we are unable to locate any in the record. Sur-reply 10. On the contrary, we find Mr. Smith’s testimony ample and well-supported such that it supports a finding that a person of ordinary skill in the art would have a reasonable expectation that GlobalPlatform and SIP would be compatible. *See In re O’Farrell*, 853 F.2d at 903 (“Obviousness does not require absolute predictability of success.”).

As for Patent Owner’s various assertions that Petitioner has failed to show a “benefit” to the combination, we disagree. “It’s not necessary to show that a combination is ‘the best option, only that it be a suitable option.’” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021) (quoting *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014)). “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR*, 550 U.S. at 417. Contrary to Patent Owner’s arguments, Petitioner does explain the benefits of adopting GlobalPlatform’s protocols. *See* Pet. 16–18. Namely, Petitioner explains that GlobalPlatform is “a hardware-neutral, vendor-neutral, Application-independent [smart] card management specification.” *Id.* at 15 (citing Ex. 1006, 16). As Petitioner’s declarant, Mr. Smith, explains, “GlobalPlatform is recognized as ‘the most important international specification for application management in multi-application smart cards’ and ‘provide[s] card issuers with mechanisms for securely managing third-party applications in the smart cards they have issued.’” Ex. 1003 ¶ 100 (quoting Ex. 1008, 290). Petitioner notes that Dua explicitly recognizes that standards, such as GlobalPlatform, were being developed by card issuers.

Pet. 14–17 (citing Ex. 1004 ¶ 14). Most importantly, Petitioner explains that Dua expressly states that Dua’s “wallet application should meet standards defined by card organizations.” *Id.* at 17 (citing Ex. 1004 ¶ 525). Thus, even if a benefit is necessary as Patent Owner argues, Petitioner has identified a concrete benefit from combining Dua with GlobalPlatform—namely, compatibility of Dua’s wallet application with the “most important international specification” for Smart Cards. *See* Ex. 1003 ¶¶ 99–103. A benefit that Dua expressly suggested was important. Ex. 1004 ¶ 525.

Patent Owner’s remaining arguments to the contrary are not persuasive. First, Patent Owner contends that Petitioner’s “own expert admits that the field at the time of the invention was extremely unpredictable and that no solutions were obvious.” PO Resp. 11–12 (citing Ex. 2009, 93:8–23, 96:13–97:13). However, a review of this testimony shows that it does not support Patent Owner’s assertion. Mr. Smith does not testify that this field of technology was unpredictable, but rather that the business market for mobile payments was still developing *in the United States*. *See* Ex. 2009, 96:13–97:13. The fact that the situation in one market is still developing does not mean that the technology itself was unpredictable. Indeed, as Mr. Smith testifies the European and Japanese markets were more advanced at the time. *See* Ex. 2009, 93:8–23. Thus, we do not agree with Patent Owner’s contention that the technology was unpredictable.

Second, Patent Owner argues that Dua’s statements about specifications developed by the credit card processors refer to the EMV Chip Specifications, not GlobalPlatform. PO Resp. 14–17. However, even if Patent Owner is correct that Dua is specifically referencing the EMV Chip Specifications, the EMV standard expressly recommends complying with

GlobalPlatform. *See* Ex. 2003, 16 (“The EMV Chip Specifications cannot be considered in isolation . . . EMVCo collaborates with other industry bodies and standard organizations . . . **GlobalPlatform** - Part of EMVCo’s activities is to review the functionality and security of platforms on which an EMV chip payment application will reside. Alignment with standards bodies such as GlobalPlatform are important as EMV chip payment applications are increasingly implemented on shared chip platforms that support multiple applications, each from a different application owner.”). Thus, we find that, even if read narrowly, Dua still would have pointed a person of ordinary skill in the art to look to GlobalPlatform. *See* Ex. 1046 ¶¶ 24–26.

Third, Patent Owner asserts that a person of ordinary skill would not look to GlobalPlatform based on Dua’s statements because unlike EMV, GlobalPlatform is not a card organization; instead it is “an organization that has been established by leading companies from the payments and communications industries, the government sector and the vendor community, and is the first to promote a global infrastructure for smart card implementation across *multiple industries*,” and “GlobalPlatform therefore is not payment-related, it is instead designed to provide multi-application smart cards.” PO Resp. 16–17. We do not find this argument persuasive. As GlobalPlatform explains, payment companies were closely involved in the development of the standard, and, while not limited to credit cards, certainly was intended to encompass them. *See* Ex. 1006, 16. Indeed, contrary to Patent Owner’s contentions that GlobalPlatform is not related to payments or interoperability and terminals, PO Resp. 15, GlobalPlatform notes its architecture is intended to include card acceptance devices and repeatedly mentions the use of the cards in payments. *See* Ex. 1006, 16

(payments), 27 (showing card acceptance devices). Thus, we find Mr. Smith’s testimony that GlobalPlatforms relates to payments and would be understood by a person of ordinary skill as aligning with Dua’s express interoperability goal well-supported and reasoned and give it substantial weight. *See* Ex. 1003 ¶¶ 43–44, 82, 100, 103; Ex. 1046 ¶¶ 22–27.

Finally, Patent Owner contends that Dua’s discussion of Java and Java applets would not have motivated a person of ordinary skill to look to a Java Card platform such as GlobalPlatform. PO Resp. 17. However, we do not agree with Patent Owner that Dua must expressly mention Java Card to support Petitioner’s argument. As Mr. Smith persuasively explains, Dua expressly teaches “Java applets running on a mobile phone,” Ex. 1004 ¶ 216, and Java Card was a well-known smart card for running Java applets in mobile devices. Ex. 1046 ¶ 27. Thus, a person of ordinary skill knowing this would have been motivated to look to GlobalPlatform “because GlobalPlatform was the ‘*de facto*’ standard for loading and managing Java-based applications with the Java Card operating system.” *Id.* (citing Ex. 1003 ¶¶ 102–105). Patent Owner’s arguments do not undermine this logical and well-reasoned testimony from Mr. Smith, which we credit. We find this further supports Petitioner’s argument that a person of ordinary skill would have been motivated to combine Dua and GlobalPlatform, because a person of ordinary skill seeking to implement the Java applications of Dua on a mobile phone would have been motivated to look to GlobalPlatform for its support of Java Card and Java applications. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have been motivated to combine Dua and GlobalPlatform.

(b) “Secure Element”

Patent Owner argues that Petitioner fails to show that the combination teaches or suggests a “secure element,” as required by the claims. PO Resp. 18–20. Patent Owner argues that, although “a smart card *may* be a secure element . . . the ’009 patent does not state or suggest that all smart cards are secure elements.” *Id.* at 19. Patent Owner asserts that a person of ordinary skill in the art “would therefore understand that a smart card may be a secure element only if it provides the necessary security, such as by being tamper-resistant.” *Id.* at 19 (citing Ex. 2007 ¶¶ 72–75). Patent Owner contends that “[w]hile some smart cards meet this definition, not every smart card will, and [Petitioner] does not show otherwise.” *Id.*

We find that Petitioner has shown sufficiently that the combination of Dua and GlobalPlatform accounts for this limitation. To begin with, we do not find the testimony of Mr. Gomez on this point to be credible or entitled to much weight. In his Declaration, Mr. Gomez contends that “a secure element must include a heightened level of security and be tamper-proof,” Ex. 2007 ¶ 73, and that “while some secure elements may be smart cards, not all smart cards are secure elements,” *id.* ¶ 71. Yet, on cross examination, Mr. Gomez repeatedly contended that smart cards and secure elements were “distinctly different” and “separate and unrelated.” Ex. 1045, 53:16–54:1. Mr. Gomez continued to assert that “the common understanding was that a secure element . . . has a very strong level of security beyond what you would normally find . . . in products at the time, such as smart cards.” *Id.* at 55:22–56:8. This cross examination testimony is inconsistent with his prior testimony and with the Specification of the ’009 patent, which explains that the secure element “may be in [the] form of a smart card.” Ex. 1001, 6:59.

There is no indication in the Specification that a “secure element” was a special product “beyond” what was available at the time. If anything, the Specification indicates that the term “secure element” is not intended to capture something different than a smart card, but rather a broad genus of items that include a smart card. *See id.* at 6:59–61 (“the [secure element] may be in [the] form of a smart card, an integrated circuit (IC) or a software module upgradable by overwriting some of all of the components therein.”). Even if we accept the Patent Owner’s contention that a person of ordinary skill in the art “would . . . understand that a smart card may be a secure element only if it provides the necessary security, such as by being tamper-resistant,”⁶ we find that Petitioner has shown that the GlobalPlatform-compliant smart cards meet this standard. As Mr. Smith explains in great detail, supported by numerous citations to the prior art, GlobalPlatform-compliant smart cards have and support numerous features designed to make them tamper-resistant. *See Ex. 1046 ¶¶ 30–36.* We find this testimony well-reasoned, well-supported, and give it substantial weight. Patent Owner argues that the use of a key set cannot make a secure element tamper resistant because a key set is separately recited in the claim. However, Mr. Gomez confirmed that “a key-based encryption scheme” was “one way” to satisfy the claim term “secure element.” *Ex. 1045, 57:7–11.* Indeed, the only security for the “secure element” mentioned in the Specification is that the secure element “in the mobile device is installed with a set of default

⁶ Patent Owner and Mr. Gomez have repeatedly stated that no construction of this term is necessary. *See Tr. 49:3–18; Ex. 1045, 55:9–56:9.* We find no need to construe it because we find that even under the “understanding” that Patent Owner has offered the prior art teaches this limitation.

keys (e.g., an Issuer Security Domain (ISD) key set by the [secure element] manufacturer).” Ex. 1001, 6:55–58. Thus, Patent Owner’s argument is not supported by the record. Accordingly, we find that Petitioner has shown sufficiently that the combination of Dua and GlobalPlatform accounts for the claimed “secure element.” *See* Ex. 1003 ¶¶ 113–115; Ex. 1046 ¶¶ 28–37.

(c) “*Preparing Data*”

Patent Owner argues that Petitioner fails to show that Dua accounts for the limitation of claim 1 that recites “wherein the server is configured to prepare data necessary for the application to function as designed on the mobile device.” PO Resp. 20–24. In particular, Patent Owner contends that Petitioner “identifies Dua’s WCM as the ‘server’ of the claims,” but “the WCM does not, even in [Petitioner]’s combination, ‘prepare data necessary for’ the application or modules to function as designed.” *Id.* at 20. Patent Owner argues that Dua’s WCM merely receives the file and forwards it to the user’s device, and that “the ’009 [patent] describes ‘data preparation’ as requiring an active role in generating or obtaining the application keys.” *Id.* at 20–21 (citing Ex. 1001, 13:25–34).

We find that Petitioner has shown by a preponderance of the evidence that Dua accounts for this limitation. We are not persuaded by Patent Owner’s contention that the term “prepares,” as used in the claim, “requir[es] an active role in generating or obtaining the application keys.” PO Resp. 21 (citing Ex. 2007 (Gomez Decl.) ¶¶ 80–83). Beginning with the claim language, we note that the claim limitation recites “prepare data” not “generate or obtain keys.” Patent Owner relies on the following discussion in the Specification to support its construction:

For data preparation, one embodiment of the present invention supports two operation modes to interact with service providers for computing the personalized application data. For the first mode, a TSM server does not have direct access to the HSM associated with a service provider. The service provider may have a server interacting with its HSM to generate the application keys (e.g., Transit, e-purse, or Mifare Key). The TSM data preparation implementation is to make use of application program interfaces (API) or a protocol provided by the server to request for derived application keys. The second mode is that data preparation implementation can directly access the HSM associated with the service provider to generate the application keys.

Ex. 1001, 13:25–34.

However, this discussion only addresses “one embodiment” and contains no language that would suggest that it is intended to limit the scope of “prepare data” in the claim. Although this example shows that “prepare data” is broad enough to include these examples, it does not limit the claim to these examples. Instead, we find that Patent Owner’s expert attempts to rewrite the claim limitation from “prepare data” to require an “active” role in “generating” or “computing” “keys.” We find that this is inconsistent with the plain language of the claims, which are broader. Rather, we find sufficient that Dua discloses that the WCM receives the file and forwards it to the user device. *See* Pet. 26–27 (citing Ex. 1004 ¶¶ 26, 57, 58, 215, 297; Ex. 1003 ¶ 147). Moreover, we note that Dua’s WCM is not limited to merely forwarding data, but “may also have the ability to make edits [to the

Personalization File] in order to ensure proper formatting.”⁷ Ex. 1004 ¶ 63. Thus, we find this accounts for the “prepares data” limitation.

(4) *Conclusion as to Claim 1*

For all of the foregoing reasons and in consideration of evidence favoring obviousness, we are persuaded by Petitioner’s arguments and evidence demonstrating that a person of ordinary skill in the art would have had reason to combine the teachings of Dua and GlobalPlatform, with a reasonable expectation of success in arriving at the subject matter claim 1 recites. As noted above, we also agree with Petitioner’s arguments and evidence that the combination of Dua and GlobalPlatform teach or suggest all of the limitations of claim 1. As a result, Petitioner establishes, by a preponderance of evidence, that claim 1 would have been obvious over the combination of Dua and GlobalPlatform.

b) *Claims 2–6, 13–15, and 17*

Petitioner has shown sufficiently that the combination of Dua and GlobalPlatform teaches or suggests the claimed subject matter of claims 2–6, 13–15, and 17. Pet. 30–48, 50–52. Besides the arguments considered above with claim 1, Patent Owner does not argue that the combination of Dua and GlobalPlatform fails to disclose the additional limitations recited by claims 2–6, 13–15, and 17. Accordingly, Patent Owner has waived any argument directed to those limitations. *See* Paper 13, 9 (“Patent Owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.”). We reviewed Petitioner’s evidence and argument and

⁷ Patent Owner suggests, in its Sur-reply, that this is a new argument, *see* Sur-reply 18, but Patent Owner itself raised this issue in its Patent Owner Response, *see* PO Resp. 21.

adopt it as our own. For the reasons provided therein, Petitioner demonstrates that the combination of Dua and GlobalPlatform accounts for the limitations of claims 2–6, 13–15, and 17, that a person of ordinary skill in the art would have been motivated to combine the references in the manner proposed, and would have had a reasonable expectation of success in doing so. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that claims 2–6, 13–15, and 17 would have been obvious over the combination of Dua and GlobalPlatform. *See* Ex. 1003 (Smith Decl.) ¶¶ 156–216, 220, 221.

c) Claim 16

Claim 16 depends from independent claim 14. Claim 14 is similar to independent claim 1 discussed above. Claim 16 additionally recites “wherein the mobile device includes a display configured to display a user interface showing some of the modules that are still provisioned and active, each of the modules is configured to show another user interface particularly designed for the display of the mobile device when the each of the modules is activated by a user.” Ex. 1001, 26:40–46. Petitioner contends that Dua renders this limitation obvious. Pet. 48–50. Petitioner argues that “Dua describes a ‘credential tree’ that ‘may be used to visually present information in the wallet application’ including credentials for extensions stored therein.” *Id.* at 48 (citing Ex. 1004 ¶¶ 345, 346). Petitioner notes that this is displayed on the display of Dua’s wireless device, and “certain screens in the wallet application may display the entire credential tree, or only certain components of it as necessary.” *Id.* at 48–49 (citing Ex. 1004 ¶¶ 41, 351). Therefore, Petitioner asserts that “Dua’s mobile device has a display configured to display a user interface showing some of the modules

(extensions and associated credentials) that are still provisioned and active because the user can select from available modules from the credential tree.” *Id.* at 49 (citing Ex. 1004 ¶ 371). Petitioner also contends that “Dua discloses or renders obvious that each of the modules (extension/credentials) are configured to show another user interface particularly designed for the display of the mobile device when each of the modules is activated by the user because Dua teaches ‘[i]ndividual credential records’ that are accessible via the ‘Credential Selector’ to ‘provide visual information about the credentials to aid a user in the selection of specific credentials,’ including various information like logos, account numbers, and indicators associated with the credential.” *Id.* (citing Ex. 1004 ¶¶ 371–378). Petitioner argues that “[a]t the least, it would have been obvious to have this collection of information displayed on a user interface designed for the mobile device for each of the credentials because of the relatively small screen size and the amount of information needing to be displayed.” *Id.* (citing Ex. 1003 ¶¶ 218, 219; Ex. 1004 ¶¶ 323, 352). Petitioner submits that, thus, “having each credential/module displayed on a separate user interface via Dua’s ‘Credential Selector’ would have been an obvious way to ensure readability of credential data.” *Id.* at 49–50.

Patent Owner argues that “Dua’s credential tree and credential selector do not disclose this limitation because they do not disclose ‘another user interface ... when each of the modules is activated by a user’ as required.” PO Resp. 24. Patent Owner asserts that “[w]hile the credential selector allows the user to select a credential, there is no disclosure of the selection process altering the user interface, much less of it being caused by any module. Instead, the user simply selects one or more credentials from

the credential tree; that credential is then used to complete whatever task the user is undertaking.” *Id.* at 24–25 (citing Ex. 1004 ¶ 371); Sur-reply 19–20. Patent Owner argues that “[w]hile the credential tree and credential selector may provide some additional information regarding the credential, such as a logo or account number, such information is still within the general credential tree as specified.” PO Resp. 25–26 (citing Ex. 1004 ¶¶ 371–377; Ex. 2007 ¶¶ 91, 92). Patent Owner submits that “[n]othing in Dua’s statement that the credential records listed in the credential tree could include additional information discloses or suggests any separate user interface, as opposed to display of additional information in the same menu.” Sur-reply 21. As for Petitioner’s obviousness theory, Patent Owner contends that “Apple’s new attorney argument that a non-existent user-interface could be presented by a module in the form of a credential is both outside the scope of its Petition, and unsupported by Dua’s disclosure.” *Id.* at 22.

As explained above, Patent Owner focuses its attention on the requirement that Dua’s credential tree will display a second user interface (e.g., new data on the screen) when a user makes a selection in the initial user interface. We find that Petitioner has accounted for the other limitations of claim 16, as explained in the Petition, Pet. 48–49, and thus, we will focus our analysis on the portion of the limitation that Patent Owner disputes. As the Petition explains, supported by Mr. Smith’s testimony, Dua teaches “[i]ndividual credential records” that are accessible via the “Credential Selector” to “provide visual information about the credentials to aid a user in the selection of specific credentials,” including various information like logos, account numbers, and indicators associated with the

credential. Pet. 49 (citing Ex. 1004 ¶¶ 371–378; Ex. 1003 ¶¶ 218–219). Given Dua’s disclosure that credentials may include a variety of additional information, we agree with Petitioner and Mr. Smith that it would have been obvious to have this information displayed on a user interface designed for the mobile device for each of the credentials. *See* Pet. Ex. 1003 ¶¶ 218–219; Ex. 1004 ¶¶ 323, 352; Ex. 1008 (Smart Card Handbook), 849 (explaining the importance of the user interface). We further agree with Petitioner that a person of ordinary skill would have been motivated to make this change because of the relatively small screen size and the amount of information needing to be displayed and the need, expressed in Dua, that the user interface must be reliable and easy to use for extensions. *See id.* As for Patent Owner’s contention that it is unclear whether the module, wallet application, or some other component displays the user interface, PO Resp. 26, Sur-reply 21–22, we do not find it persuasive. The Petition maps Dua’s extensions to the modules of claim 14 (and by extension claim 16, which depends from claim 14). Pet. 46. Dua’s extensions “extend” the functions of the credentials (Pet. 18), allowing the credentials in Dua to function with Dua’s wallet application. *See* Ex. 1004 ¶ 297; *see also id.* ¶¶ 290–293 (listing example credentials such as a subway stored value card; grocery store loyalty card). Thus, we agree with Petitioner that Dua teaches credential tree lists for these credentials/extensions such that when a user selects a credential/extension, it is the credential/extension (i.e., claimed “module”) which displays another user interface to visually provide its own relevant additional information to the user. *See* Ex. 1004 ¶¶ 294 (“Extensions can utilize all features that the wallet platform makes available to it, including . . . standard display parameters”), 311 (“The wallet shell also

provides extensions with a standard menu-driven user interface from which to operate.”). Accordingly, we find that Petitioner has shown by a preponderance of the evidence that claim 16 would have been obvious over the combination of Dua and Global Platform.

d) Summary

Accordingly, we find that Petitioner has shown by a preponderance of the evidence that claims 1–6 and 13–17 of the ’009 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Dua in view of GlobalPlatform.

2. Alleged Obviousness of Claims 7–10 over Dua, GlobalPlatform, and Smart Card Handbook

Petitioner has shown sufficiently that the combination of Dua, GlobalPlatform, and Smart Card Handbook teaches or suggests the claimed subject matter of claims 7–10. Pet. 52–60. Besides the arguments considered above with claim 1, Patent Owner does not argue that the combination of Dua, GlobalPlatform, and Smart Card Handbook fails to disclose the additional limitations recited by claims 7–10. Accordingly, Patent Owner has waived any argument directed to those limitations. *See* Paper 13, 9 (“Patent Owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.”). We reviewed Petitioner’s evidence and argument and adopt it as our own. For the reasons provided therein, Petitioner demonstrates that the combination of Dua, GlobalPlatform, and Smart Card Handbook accounts for the limitations of claims 7–10, that a person of ordinary skill in the art would have been motivated to combine the references in the manner proposed, and would have had a reasonable expectation of success in doing so. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that

claims 7–10 would have been obvious over the combination of Dua, GlobalPlatform, and Smart Card Handbook. *See* Ex. 1003 (Smith Decl.) ¶¶ 223–249.

3. Alleged Obviousness Over of Claims 11 and 12 Over Dua, GlobalPlatform, Smart Card Handbook, and Thibadeau

Petitioner has shown sufficiently that the combination of Dua, GlobalPlatform, Smart Card Handbook, and Thibadeau teaches or suggests the claimed subject matter of claims 11 and 12. Pet. 61–64. Besides the arguments considered above with claim 1, Patent Owner does not argue that the combination of Dua, GlobalPlatform, Smart Card Handbook, and Thibadeau fails to disclose the additional limitations recited by claims 11 and 12. Accordingly, Patent Owner has waived any argument directed to those limitations. *See* Paper 13, 9 (“Patent Owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.”). We reviewed Petitioner’s evidence and argument and adopt it as our own. For the reasons provided therein, Petitioner demonstrates that the combination of Dua, GlobalPlatform, Smart Card Handbook, and Thibadeau accounts for the limitations of claims 11 and 12 that a person of ordinary skill in the art would have been motivated to combine the references in the manner proposed, and would have had a reasonable expectation of success in doing so. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that claims 11 and 12 would have been obvious over the combination of Dua, GlobalPlatform, Smart Card Handbook, and Thibadeau. *See* Ex. 1003 (Smith Decl.) ¶¶ 250–260.

III. CONCLUSION⁸

After reviewing the complete record developed during the course of the trial, we conclude that Petitioner demonstrates, by a preponderance of the evidence, that claims 1–17 of the '009 patent are unpatentable.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner establishes by a preponderance of the evidence that claims 1–17 of the '009 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

In summary:

⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

Claims	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–6, 13–17	103	Dua, GlobalPlatform	1–6, 13–17	
7–10	103	Dua, GlobalPlatform, Smart Card Handbook	7–10	
11, 12	103	Dua, GlobalPlatform, Smart Card Handbook, Thibadeau	11, 12	
Overall Outcome			1–17	

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FOR PETITIONER:

Adam P. Seitz
Paul R. Hart
ERISE IP, P.A.
adam.seitz@eriseip.com
paul.hart@eriseip.com
PTAB@eriseip.com

FOR PATENT OWNER:

Vincent J. Rubino, III
Peter Lambrianakos
Richard Cowell
FABRICANT LLP
vrubino@fabricantllp.com
plambrianakos@fabricantllp.com
rcowell@fabricantllp.com