

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADOBE INC.,
Petitioner

v.

EXPRESS MOBILE, INC.,
Patent Owner.

Case IPR2021-01228
Patent No. 9,063,755

DECLARATION OF KEVIN C. ALMEROOTH, PH.D.

TABLE OF CONTENTS

I.	INTRODUCTION AND BACKGROUND	1
II.	QUALIFICATIONS	2
III.	MATERIALS CONSIDERED	13
IV.	PERSON OF ORDINARY SKILL IN THE ART (“POSA”).....	13
V.	BACKGROUND OF THE ’755 PATENT	15
A.	Technology Background	15
B.	Brief Summary of the ’755 Patent	16
VI.	SUMMARY OF THE ASSERTED REFERENCES	17
A.	U.S. Patent Pub. No. 2007/0118844 (“Huang”)	17
B.	U.S. Patent Pub. No. 2007/0067421 (“Angelov”)	19
VII.	DETAILED ANALYSIS OF CLAIM 1.....	21
A.	Huang and Angelov fail to disclose or render obvious “the device provides the user provided one or more input values and corresponding input symbolic name to the web service.”	23
B.	Huang and Angelov fail to disclose or render obvious “the web service utilizes the input symbolic name and the user provided one or more input values.”	30
C.	Huang and Angelov fail to disclose or render obvious “said Player receives the output symbolic name.”	33
D.	Huang and Angelov fail to disclose or render obvious “an authoring tool configured to . . . produce a Player.”	33
VIII.	ANALYSIS OF DEPENDENT CLAIMS 2, 7, and 11.....	43
IX.	LEGAL STANDARDS	44
X.	ADDITIONAL REMARKS	47

I. INTRODUCTION AND BACKGROUND

1. I have been retained as an expert witness by Express Mobile, Inc. (“Express Mobile”) and have been asked to provide my expert opinions regarding U.S. Patent No. 9,063,755 (“the ’755 patent,” Ex. 1001).

2. In this declaration I provide my independent analysis of the ’755 patent in light of the materials cited below and my knowledge and experience in this field during the relevant time frame. I have been asked to consider what one of ordinary skill in the art at the time of the invention of the ’755 patent (a “POSA”; refer to IV below) would have understood from the specification, including scientific and technical knowledge related to the patent. I have also been asked to consider whether certain references disclose or render obvious the invention described by claims 1, 2, 7, and 11 of the ’755 patent.

3. My findings, as explained below, are based on my study, experience, and background in the fields discussed below, informed by my education in computer science and web-based design, and my extensive experience in the fields of browser-based user interfaces and network services. I have also relied on my review and analysis of the cited references, information provided to me, and information that I have independently reviewed.

4. I am being compensated for my independent analysis as an expert with respect to this *inter partes* review proceeding, but my compensation is not contingent

in any way on the content of my analysis or the outcome of this proceeding. I have no financial interest in Petitioner (Adobe) and I have no financial interest in the challenged patent.

II. QUALIFICATIONS

5. I am currently a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB). While active at UCSB, I held faculty appointments and was a founding member of the Computer Engineering (CE) Program, Media Arts and Technology (MAT) Program, and the Technology Management Program (TMP). I also served as the Associate Director of the Center for Information Technology and Society (CITS) from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

6. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia System, minor in Telecommunications Public Policy) earned in June 1997. During my education, I have taken a wide variety of courses as demonstrated by my minor.

My undergraduate degree also included a number of courses more typical of a degree in electrical engineering including digital logic, signal processing, and telecommunications theory.

7. One of the major concentrations of my research over the past 30+ years has been the delivery of multimedia content and data between computing devices, including various network architectures. In my research, I have studied large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged between individual computers and portable devices. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

8. In 1992, the initial focus of my research was on the provision of interactive functions (e.g., VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the

development of techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

9. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was used mostly for text-based, non-real time applications, the interest in sharing multimedia content, such as video, quickly developed. Multimedia-based applications ranged from downloading content to a device to streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques since multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called “multicast,” first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicast is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand, distance learning, distributed collaboration, distributed games, and large-scale

wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

10. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

11. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to join one of the existing channels and watch the content at the point it was currently being transmitted.

12. The IMJ service combined the interactivity of the web with the streaming capabilities of the Internet to create a jukebox-like service. It supported true Video-on-Demand when capacity allowed, but scaled to any number of users based on queuing requested programs. As part of the project, we obtained permission from Turner Broadcasting to transmit cartoons and other short-subject content. We also connected the IMJ into the Georgia Tech campus cable television network so that students in their dorms could use the web to request content and then view that content on one of the campus's public access channels.

13. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (i.e., when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

14. As a parallel research theme, starting in 1997, I began researching issues related to wireless devices and sensors. In particular, I was interested in showing how to provide greater communication capability to "lightweight devices," i.e., small form-factor, resource-constrained (e.g., CPU, memory, networking, and

power) devices. Starting in 1998, I published several papers on my work to develop a flexible, lightweight, battery-aware network protocol stack. The lightweight protocols we envisioned were similar in nature to protocols like Bluetooth, Universal Plug and Play (UPnP) and Digital Living Network Alliance (DLNA).

15. From this initial work, I have made wireless networking-including ad hoc, mesh networks and wireless devices-one of the major themes of my research. My work in wireless network spans the protocol stack from applications through to the encoding and exchange of data at the data link and physical layers.

16. At the application layer, even before the large-scale “app stores” were available, my research looked at building, installing, and using apps for a variety of purposes, from network monitoring to support for traditional computer-based applications (e.g., content retrieval) to new applications enabled by ubiquitous, mobile devices. For example, my research has looked at developing applications for virally exchanging and tracking “coupons” through “opportunistic contact” (i.e., communication with other devices coming into communication range with a user). In many of the courses I have taught there is a project component. Through these projects I have supervised numerous efforts to develop new “apps” for download and use across a variety of mobile platforms.

17. Toward the middle of the protocol stack, my research also looked to build wireless infrastructure support to enable communication among a set of mobile

devices unaided by any other kind of network infrastructure. These kinds of networks are useful either in challenged network environments (e.g., when a natural disaster has destroyed existing infrastructure) or when suitable support for network communication never existed. The deployment of such networks (or even the use of traditional network support) are critical to support services like disaster relief, catastrophic event coordination, and emergency services deployment.

18. Yet another theme is monitoring wireless networks, in particular different variants of IEEE 802.11 compliant networks, to (1) understand the operation of the various protocols used in real-world deployments, (2) use these measurements to characterize use of the networks and identify protocol limitations and weaknesses, and (3) propose and evaluate solutions to these problems. I have successfully used monitoring techniques to study wireless data link layer protocol operation and to improve performance by enhancing the operation of such protocols. For wireless protocols, this research includes functions like network acquisition and channel bonding.

19. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Starting in 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a \$4.3M grant proposal to the

Army Research Office (ARO) at the Department of Defense to propose and develop a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. A number of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used firewalls, including their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

20. Recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement, especially when content being shared and the cache has geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs. Our work on reputation systems showed that reputations have economic value, and as such, creates a motivation to manipulate reputations. In response, we developed a variety of solutions to protect the integrity of reputations in online social networks. The techniques we developed for content delivery and reputation management were

particularly relevant in peer-to-peer communication and recommendations for downloadable "apps."

21. As an important component of my research program, I have been involved in the development of academic research into available technology in the marketplace. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including many content delivery-related working groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

22. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the

International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the International Workshop On Wireless Network Measurement (WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet Symposium, and I have served on the program committees for numerous conferences.

23. Furthermore, in the courses I taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication including the physical and data link layers of the Open System Interconnect (OSI) protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed

Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, *see* Ex. 2004, which is my curriculum vitae (CV).

24. In addition, I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very accurate emulation systems for the military's next generation internetwork. Santa Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of environments in which it was expected to operate, and, in particular, for network services including IPv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

25. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include

IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

26. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

27. Additional details about my employment history, fields of expertise, and publications are further included in my current *curriculum vitae* (Ex. 2004).

III. MATERIALS CONSIDERED

28. In forming my opinions expressed herein, I have reviewed, without limitation: all materials cited and referenced herein and all materials cited and referenced in the petition, including exhibits thereto. I have considered the claims, specification, and prosecution history of the '755 patent. I have also considered the materials submitted to the PTAB by both parties in connection with IPR2021-00709, IPR2021-00710, IPR2021-00711 (the "Google IPRs"), which related to the '755 patent family, and the October 4, 2021 decisions by the PTAB denying institution of each of the three Google IPRs. As part of my analysis for this Declaration, I have considered my own knowledge and experience, including my work and experience with web-based user interfaces, Web site design, and programming.

IV. PERSON OF ORDINARY SKILL IN THE ART ("POSA")

29. I understand that the teaching of the prior art is viewed through the eyes of a POSA. Counsel for Express Mobile has informed me that a person of ordinary

skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. In my opinion, the relevant field of art for the '755 patent is that of software development and web design and development. I have also been informed by counsel for Express Mobile that the person of ordinary skill is generally familiar with the type of problems encountered in the field and the prior art solutions to those problems and possesses an ordinary level of creativity.

30. For the purpose of this Declaration, counsel for Express Mobile has instructed me to assume that, for the '755 patent, the time of the invention is in the 2008 timeframe, and specifically November 11, 2008, which is the filing date of U.S. Provisional Application No. 61/113,471 identified in the '755 patent. However, I understand that the conception dates of the inventions disclosed may have been earlier than those dates. For example, counsel informed me that the '755 patent family may have a conception date of at least as early as January 12, 2008. Any such earlier conception date does not alter my opinion regarding a person of ordinary skill in the art.

31. In my opinion, a person of ordinary skill in the art of the '755 patent would include someone who had a bachelors or graduate degree in computer science, mathematics, engineering, or a similar discipline together with knowledge of software development and web design and development, together with approximately two or three years of experience in the field relating to web design

and development. The required levels of educational and industry experience are on a sliding scale relative to each other. For example, a person of ordinary skill could potentially have no educational degree but more industry experience or, conversely, could have something higher than an undergraduate degree with fewer years of industry experience. In the relevant time frame, I qualified as a person of ordinary skill in the art.

V. BACKGROUND OF THE '755 PATENT

A. Technology Background

32. Although I will discuss further details of the '755 patent below, I provide here some background information regarding technologies relevant to the inventions claimed in the '755 patent.

33. The '755 patent is within a family of patents (the “Web Component Patents”) that arose from a recognition that “[i]nternet-connected mobile devices [were] becoming ever more popular,” but that many mobile devices “d[id] not have the capabilities of non-mobile devices including computing, input and output capabilities” with web services available on the Internet. '755 Patent at 1:15-18. Before the invention of the Web Component Patents, accessing web services from a web page or a web application required manually coding the following data flow: receiving and parsing user inputs to a web page, connecting to a web service, sending user inputs to the remote web service, receiving and parsing outputs from the web

services, and generating HTML code to display the outputs. The Web Component Patents addressed this problem.

34. The Web Component Patents also note that with the ubiquity of the Internet comes a wide range of devices: “[t]he mobility of the user while using . . . devices provides challenges and opportunities for the user of the Internet.” ’755 Patent at 1:19-21. For example, “there are a large number of types of devices and they tend to have a shorter lifetime in the marketplace,” and “[t]he programming of the myriad of mobile devices is a time-consuming and expensive proposition.” ’755 Patent at 1:21-25. For this reason, there was “a need in the art for a method and apparatus that permits for the efficient programming of mobile devices,” which “should be easy to use and provide output for a variety of devices.” ’755 Patent at 1:23-26. The Web Component Patents, including the ’755 patent, address these needs by providing an efficient way of generating code that can be used to allow a device to interact with web services.

B. Brief Summary of the ’755 Patent

35. The ’755 patent relates to an architecture that allows for the display of web service content on a device platform. In some embodiments, “[t]he system includes a database of web services obtainable over a network and an authoring tool. The authoring tool is configured to define an object for presentation on the display, select a component of a web service included in said database, associated said object

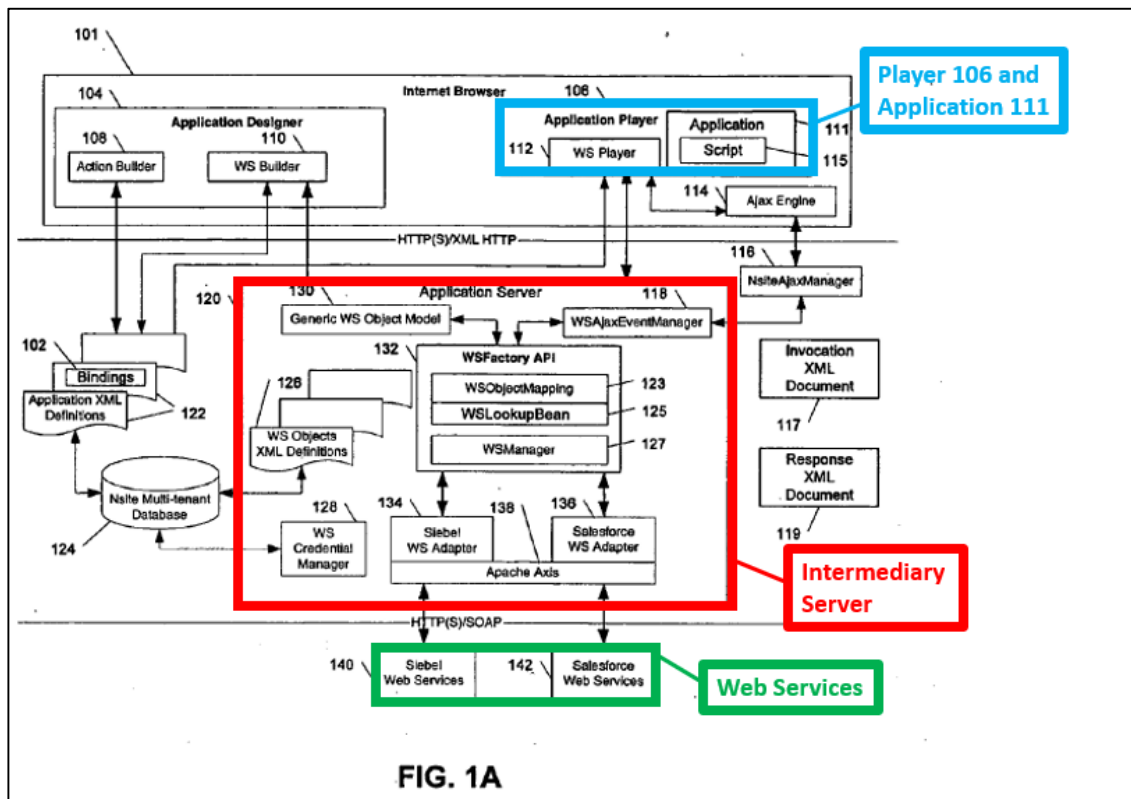
with said selected component, and produce code that when executed on the platform, provides said selected component on the display of the platform.” ’755 Patent at 1:25-42. In other embodiments, the claims recite a method that performs similar functionality. *Id.* at 1:51-58. Within the claimed architecture, the invention includes the use of symbolic names that are used to associate inputs and outputs of web services with objects on a display. *Id.* at 37:16-23 (claim 1). And the invention includes software code, including an application and a player, wherein the application is a device independent code that may be interpreted by the player. *Id.* at 2:1-3.

VI. SUMMARY OF THE ASSERTED REFERENCES

A. U.S. Patent Pub. No. 2007/0118844 (“Huang”)

36. I have reviewed Ex. 1005, which is U.S. Patent Pub. No. 2007/0118844 by Huang et al. I refer to Ex. 1005 herein as “Huang.” Huang discloses using an intermediary web server to communicate information between a device and a web service. Huang’s “goal is to access databases and/or business logic of organizations via web services” and to do so in a “vendor-independent” manner. Huang at ¶¶ 007, 057, 075. As Huang explains, “[o]ne approach to invoking the web service object would be to call vendor-specific objects directly from applications.” Huang at ¶ 074. However, Huang provides that this approach—a device directly communicating with a web service—should be avoided because “[t]hat approach requires the application

to know details about each vendor specific object, and ties the application to a particular web services vendor.” *Id.* Instead, Huang proposes a system that relies on a Generic Web Service Model (also referred to as a Generic WS Object or a WSOBJECT) and a Web Service Factory Application Programming Interface. *See id.* at ¶¶ 044, 74. Specifically, in Huang’s system, “[a]pplications interact with the generic web services object and need not contain hard-coded dependencies on vendor specific objects [i.e., objects of the web service].” *Id.* at ¶ 74. Rather than having a device interact directly with a web service, Huang discloses using a WSOBJECTMapping, “which maps, i.e., converts the Generic WS Object Model 130 (WSOBJECT) to vendor-specific Application Programming Interfaces.” *Id.* at ¶ 044. Huang’s use of the intermediary, including its WSOBJECTMapping, is illustrated in Figure 1A, below (annotated).



Id. at Fig. 1A (annotated). As shown and described, Huang’s intermediary Application Server 120 (annotated in red) allows the application and player (annotated in blue) to know no details about each vendor specific object (annotated in green). *Id.* at ¶ 74. Instead, the intermediary server receives generic requests from the application and player and converts the requests into queries specific to a web service. *See, e.g., id.* at ¶¶ 044, 074. Then the intermediary, alone, interacts with the web service. *Id.* at ¶ 124. Huang’s web service implementation uses the intermediary server to display web services in a browser. *Id.* at ¶¶ 41-42 & FIG. 1A.

B. U.S. Patent Pub. No. 2006/0200749 (“Shenfield”)

37. I have reviewed Ex. 1007, which is U.S. Patent Pub. No. 2006/0200749 by Shenfield. I refer to Ex. 1007 herein as “Shenfield.” I have also reviewed the

petition and Dr. Cullimore’s declaration in support thereof, and I note that Petitioner primarily relies on Huang for purportedly disclosing almost all claim elements of claim 1 of the ’755 patent, including the claim elements I discuss in this declaration.

38. To the extent that Petitioner relies on Shenfield, I note that Shenfield is directed toward a “Web Application” converter that “convert[s] a page-based application to a component based application for execution on a device.” Shenfield at Abstract. As Shenfield notes, the conversion was designed to move away from the disadvantage of page-based applications on web browsers, which “ha[d] a disadvantage of requesting pages (screen definitions in HTML) from the Web Service, which hinders the persistence of data contained in the screens.” Shenfield, ¶ 3. The component application, instead of being run in a browser is “executed within [a] terminal runtime environment 206, which supports access to Web Service 106 operations.” Shenfield, ¶ 39. The component-based application model, according to Shenfield, “combines the simplicity of browser-based applications with the efficiency of native application execution.” Shenfield, ¶ 54. Therefore, the focus of the claimed invention in Shenfield is to convert browser-based, single page application to the component based model using “conversion tools” disclosed in the specification. *See* Shenfield, ¶ 90 & Claim 1. The specification illustrates multiple examples of such application “conversions.” Shenfield, ¶¶ 96-100.

39. As noted above, I have reviewed Dr. Cullimore’s description of Shenfield. *See* Ex. 1002 ¶¶ 84-88. The description does not mention that Shenfield is a tool to convert applications from browser-based ones to component-based ones a single time. In ignoring this central purpose of the invention, Dr. Cullimore glosses over central details discussed in Shenfield’s specification, and in particular the fact that Shenfield is solely directed to a conversion from browser-based Applications to component-based ones, not to a distinct Application and Player (let alone an Application and Player that must be “separate” as has been previously construed by the Court). Dr. Cullimore uses words such as “device-independent” and “device-dependent” to characterize aspects of Shenfield’s disclosure in a conclusory fashion.

VII. DETAILED ANALYSIS OF CLAIM 1

40. In my opinion, there is no likelihood that Huang in view of Shenfield could render claim 1 of the ’755 patent obvious. Huang discloses a system that operates in a fundamentally different manner than as described in claim 1 of the ’755 patent. By its use of the intermediary server 120, Huang discloses—and touts the benefits of—a system that allows a device that knows no specific details of any web service. Claim 1 of the ’755 patent, conversely, describes the approach that Huang disparages. Specifically, claim 1 allows a device to communicate directly with a web service, and thus know specific details of the web service vendor’s objects. In this

way, the patented claims allow a device to efficiently communicate with a web service to provide and retrieve information without the use of an intermediary server.

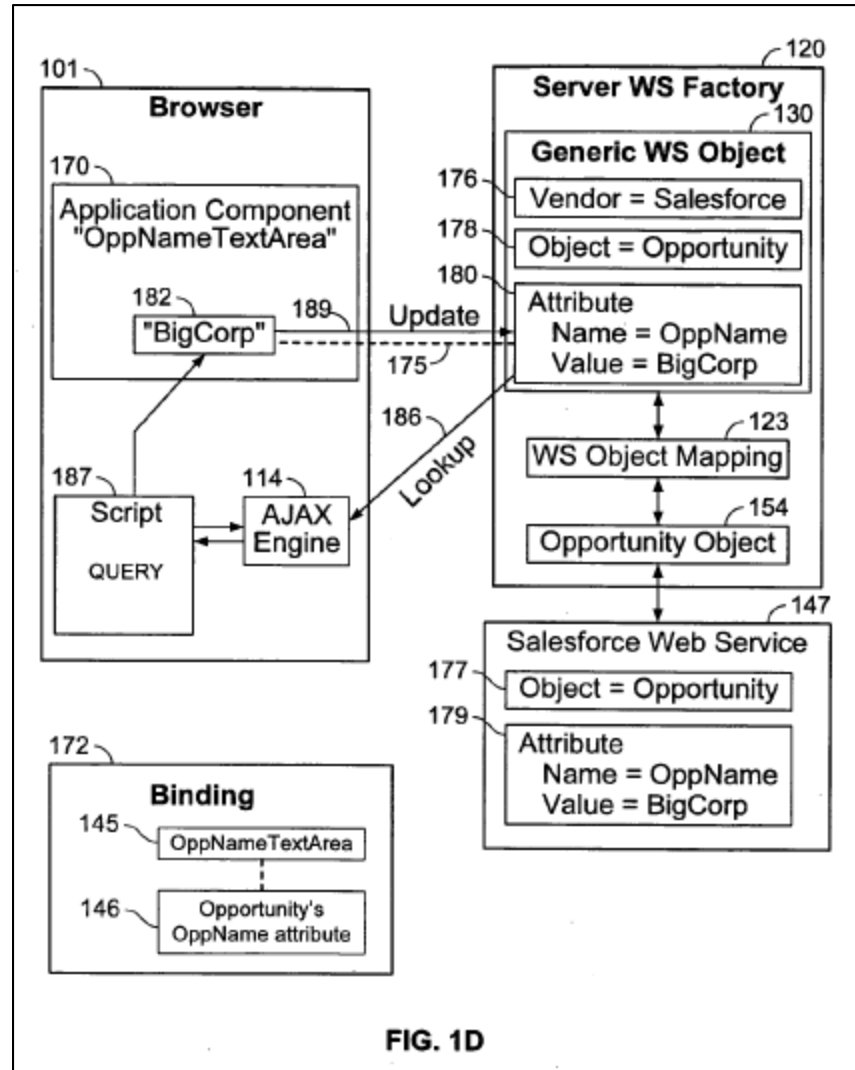
41. Likewise, to the extent that Petitioner seeks to combine Huang with Shenfield, Petitioner (and its expert) provide generic reasons for the alleged combination, but ignores that Huang and Shenfield are directed to fundamentally different problems. For example, whereas Huang is directed at the use of an intermediary server that can be used in connection with web services supplied by different vendors and displayed in browsers, Shenfield is directed to converting web service applications *away* from browser-based application to component-based applications. In my opinion, Huang and Shenfield are directed to disparate solutions for problems in the web service field, and any proposed combination that Petitioner advances is hindsight driven and would neither have been attempted by a POSA nor would have been successfully combined. Even if a POSA would have combined Huang and Shenfield, moreover, any combination of the two references would fail to teach certain claim elements of the '755 Patent, as discussed below.

42. As Petitioner's proposed system (Huang in view of Shenfield) operates in a fundamentally different way than the system described by claim 1, the proposed system fails to anticipate or render obvious numerous elements of the claim, as I discuss in detail below.

A. Huang and Shenfield fail to disclose or render obvious “the device provides the user provided one or more input values and corresponding input symbolic name to the web service.”

43. In my opinion, Huang in view of Shenfield fails to disclose or render obvious this element. Claim 1 requires an “Application and Player [that] are provided to the device” and that “the device provides the user provided one or more input values and corresponding input symbolic name to the web service.” ’755 patent at claim 1. I have reviewed the petition and Dr. Cullimore’s declaration for this and other claim elements (the discussion of ground 1 in each is copied almost verbatim). Dr. Cullimore opines that the claimed “device” is disclosed in Huang by a computer that hosts web browser 101, as highlighted in blue in the above annotated Fig. 1A (in my Summary of Huang section). Ex. 1002 ¶ 192. Specifically, he refers to the “browser that runs on a device” (bounded by the yellow box annotation in his Figure 1A in paragraph 192), as referencing the claimed device. Moreover, I note that Dr. Cullimore opines that the claimed web service is disclosed by Huang’s Salesforce web service, as highlighted in green in the above annotated Fig. 1A and shown in Dr. Cullimore’s annotated Figure 1D. *Id.* at ¶ 199. Huang discloses that a vendor web service may be, for example, the Siebel web service 140 or the Salesforce web service 142, as shown in green at the annotated Fig. 1A. *See, e.g.*, Huang at ¶¶ 40, 57. As I discuss above in the summary of Huang, the computer running the browser and the web services of Huang do not interact, but instead require an intermediary

server 120. Thus, a POSA would understand that what Dr. Cullimore opines is the “device” does not provide anything, including “one or more input values and corresponding input symbolic name” “to the web service,” as required by claim 1. To the extent that anything is provided to what Dr. Cullimore opines is the claimed “web service,” it is provided by the intermediary server 120. This is shown above in the annotated Fig. of 1A and is reiterate with respect to Fig. 1D, as shown below (and as is annotated in Paragraph 199 of Dr. Cullimore’s disclosure):



Huang at Fig. 1D. Huang discloses that “an application running in an Application Player 106, which is in turn running in the browser 101, *interacts with the WS Factory 120* running in a server 120.” *Id.* at ¶ 057 (emphasis is mine). Huang’s application and player (on the browser of the purported device) cannot interact with the purported web server, and thus cannot provide any user input, symbolic names, or information to the web server. *Id.* Instead, the application and player must interact with a generic WS Object on the intermediary server 120. *Id.* And the intermediary server 120 does not merely pass information along to the web service; it maps (i.e., converts) a generic WS Object provided by the device and then provides any results of the mapping to the web service. *Id.* I note that Huang describes this in more detail in paragraph 123. As Huang describes, the WSLookupBean 125 of the intermediary server 120 (shown in Fig. 1B, above) receives information from the device and uses a lookup table to convert the information and generate a “query string.” *Id.* at ¶ 123. The WSFactory of the intermediary server 120 then “receives the query string and makes the underlying web service call to the web service.” *Id.* Thus, only the intermediary server—and not the purported device—provides values to the web service. Moreover, because of the conversion within the intermediary server, the information provided to the web service differs from that provided by the device to the intermediary server 120. *Id.*

44. To recap: Petitioner’s proposed combination of references operates in a fundamentally manner and thus does not disclose or render obvious this element for two separate reasons, either of which a POSA would understand to mean that Huang does not disclose or render obvious this claim element. *First*, Huang’s purported “device” provides no information to the **web service** at all, only the intermediary server 120 does. Second, to the extent Huang’s web service receives some input symbolic name , Huang’s purported web service would not receive any symbolic name that came from the purported device because intermediary server 120 would convert any such name before making a web service call to the web server. As I’ve discussed, Huang discloses a device that does not know web service-specific information, including “symbolic names required for evoking one or more web components,” as recited in claim 1. The purported device of Huang simply does not know any “symbolic names required for evoking one or more web components,” and thus certainly cannot provide any. To the extent that Dr. Cullimore identifies a symbolic name of the web service attribute as “OppName,” therefore, Petitioner still fails to point to disclosures that teach this limitation. Cullimore, ¶ 199.

45. I also note that, the intermediary server 120, which provides information to the web service, is **not** part of the purported device (the computer running the browser), and Dr. Cullimore offers no opinion to the contrary. Dr. Cullimore opines that “*Huang’s* application and player are provided to the device

for execution because the player is provided to and executes in a browser that runs on a device.” Ex. 1002 ¶ 192. Huang provides that intermediary server 120 provides player 106. Huang at ¶ 41 (“The Designer 104 and Player 106 are provided to the Internet Browser 101 *by a server 120* as web pages.” (emphasis added)). Thus, intermediary server 120 is not within the purported device; otherwise, the server could not provide player 106 to the device because the player 106 would already be within the device (and Huang would thus fail to satisfy the “Player [is] provided to the device” limitation of claim 1). Moreover, a POSA would readily recognize that the server 120 is separate from a device running a browser, as Huang describes it as such. For example, Huang describes the server 120 as a server that provides web pages, such as an “application server computer program such as JBoss.” *Id.* at ¶ 041. Moreover, Huang describes the server 120 communicating with the computer over a network using network protocols. *Id.* Huang further describes the server as having a different address than the computer. *Id.* Dr. Cullimore offers no opinion that server 120 is within the purported device, and a POSA would readily recognizing that it is not. Huang’s intermediary server is not part of the web service 156. Huang discloses that intermediary server 120 “communicates with the web service via a network protocol” (Ex. 1007, ¶ 043), which a POSA would understand to mean to that the intermediary server and web service are separate.

46. It would not be obvious to a POSA to modify Huang to cure the deficiencies discussed above, and Dr. Cullimore offers no opinion to the contrary. As I discussed above, Petitioner’s proposed combination fails to disclose or render obvious this element in at least two respects: (1) Huang’s purported “device” provides no information to the web service at all, only the intermediary server 120 does and (2) to the extent Huang’s web service receives some sort of input symbolic name, the name would not be come from the device, but instead it would be generated by the intermediary server 120. Dr. Cullimore offers no opinion that it would be obvious to modify the proposed combination to cure these deficiencies.

47. Dr. Cullimore implicitly admits that Huang does not explicitly disclose providing input symbolic name to the web service. Without explanation, he states in a conclusory fashion that “[a] POSITA would have understood from *Huang*’s disclosures that *Huang*’s system associates the input value to the bound symbolic name, and both are sent to the web service because a POSITA would understood that raw data without any identifying information could not be used by a web service because the web service would have been unable to identify to what attribute the value relates.” Ex. 1002 ¶ 198. To the extent he identifies anything, he alleges that “BigCorp” is an input value corresponding to the OppName symbolic name (*id.* ¶ 199), but does not explain how or why that is a symbolic name or how “BigCorp” corresponds to an input corresponding to that name. From my review of *Huang*, it

is plain that Dr. Cullimore uses hindsight to assert that *Huang* teaches these elements, as “OppName” is nowhere identified as an identifier akin to a symbolic name in *Huang* (he just cherry-picks it from Figure 1D), and “BigCorp” is identified as a “value 182 of the *application component 170*,” not as an input value of an input symbolic name. Huang at ¶ 169 (emphasis added). Moreover, even if Huang does disclose or render obvious providing a symbolic name to the web any such symbolic name would not be provided by the device, as claim 1 requires. To the extent the purported web service receives any input symbolic name, the name would be generated and provided not by the device, but by intermediary server 120, which uses mapping to convert the name before it is provided to the web service, as I’ve discussed. Dr. Cullimore further admits this by implication in his annotated Figure 1D (paragraph 199), where he conspicuously highlights the alleged input symbolic name and web service in yellow within both the browser 101 and Salesforce Web Service 148, but glosses over (and does not highlight) the intermediary “Server WS Factory” 120 which is used to provide the alleged input to the web service. As a POSA would understand, whether the web service necessarily receives a symbolic name (as Dr. Cullimore opines) is a question of whether *intermediary server 120* provides an input symbolic name, not the device, as the claims require. For these at least these reasons, it is my opinion that Huang does not disclose or render obvious

this limitation. Shenfield does not cure these deficiencies of Huang and Dr. Cullimore offers no opinion to the contrary for this limitation.

48. Finally, in connection with this limitation, I have reviewed the October 4, 2021 Institution decision in *Google LLC v. Express Mobile, Inc.*, IPR2021-00709 (Paper 7), which denied institution of an IPR ground against the '755 patent involving Huang as a primary reference. I rendered similar opinions regarding Huang in that proceeding. In the decision denying institution, the Board (correctly, in my view), found that this limitation was not taught by Huang. *See id.* at 13-14. As the Board correctly noted, “Huang does not necessarily provide the claimed ‘input symbolic name’ to the web service.” *Id.* at 14. Instead, Huang uses a “vendor specific adaptor to interact with the web service.” *Id.* This is consistent with my testimony above, where I explained that Huang uses an intermediary server to provide any alleged input symbolic names to a web service, not the device itself as the claim requires.

B. Huang and Shenfield fail to disclose or render obvious “the web service utilizes the input symbolic name and the user provided one or more input values.”

49. In my opinion, Huang in view of Shenfield fails to disclose or render obvious this element. Claim 1 requires that “the web service utilizes the input symbolic name and the user provided one or more input values.” '755 patent at claim 1. I understand that the word “the” in this term refers to the previously described

input symbolic name provided by the device. *Id.* As I discussed in the previous section, it is my opinion that the web service never receives the input symbolic name from the device. A POSA would understand that, because the web service never receives the input symbolic name it can never utilize it. Instead, Huang teaches that a web service utilizes attributes, not from the purported device, but from Vendor-Specific WS Objects of the intermediary server 120. Huang at ¶¶ 069, 104, Fig. 1D. As Huang describes, and as shown in Huang’s Figure 1D, the Salesforce Web Service 147 (what Dr. Cullimore opines is the web service) processes a Vendor-Specific WS-Object 147, which is created by the Server WS Factory 120. As I noted, Huang discloses that the device knows *no details* about *vendor specific objects*. Huang at ¶ 074. But as Huang describes, the details of the vendor specific objects is precisely what the web service “utilizes.” Thus, a POSA would understand that Huang discloses that the purported web service is not utilizing any input symbolic name provided by the purported device, and indeed teaches away from doing so. *See id.* In my opinion, neither Huang nor Shenfield render this element obvious, and Dr. Cullimore offers no opinion to the contrary.

50. Additionally, to the extent that Dr. Cullimore identified the “OppName” in Figure 1D as the input symbolic name in the preceding limitation for an input value of “BigCorp” (which, for reasons I explained above, is not even a disclosure of a symbolic name or an input value corresponding to that symbolic

name, as required), he does not provide any disclosure from Huang that would suggest that the alleged “input symbolic name and the user provided one or more input values” is somehow utilized “for generating one or more output values having an associated output symbolic name.” Indeed, the disclosures that Dr. Cullimore cites simply refer to generic filtering and retrieval capabilities that are divorced from any reference to an “output symbolic name” or the display of output values. *See* Ex. 1002 ¶ 201 (citing Ex. 1005 at ¶¶ 62, 109). One of the disclosures refers to “reduce the quantity of data to be retrieved from a web service” through a filtering operation (Ex. 1005 at ¶ 62), and the other refers to “retrieval of web service objects” (*id.* ¶ 109)—neither reference particular output values tied to a previous input value, or identify an “output symbolic name” as claimed. This reinforces that Huang, alone or in combination with Shenfield (which neither Petitioner nor Dr. Cullimore address in connection with this claim element), does not teach this limitation.

51. Finally, in connection with this limitation, I have reviewed the October 4, 2021 Institution decision in *Google LLC v. Express Mobile, Inc.*, IPR2021-00709 (Paper 7), which denied institution of an IPR ground against the ’755 patent involving Huang as a primary reference. I rendered similar opinions regarding Huang in that proceeding. In the decision denying institution, the Board (correctly, in my view), found that this limitation was not taught by Huang. *See id.* at 15. As the Board correctly noted, “the web service of Huang receives a converted name

from the intermediary server, rather than ‘the input symbolic name’ from the device as claimed,” and therefore did not “teach[] this limitation.” *Id.* I again agree, and this is again consistent with my testimony above.

C. Huang and Shenfield fail to disclose or render obvious “an authoring tool configured to . . . produce a Player.”

52. In my opinion, Huang in view of Shenfield fails to disclose or render obvious this element. Claim 1 requires “an authoring tool configured to . . . Produce a player.” ’755 patent at claim 1. For this limitation, Dr. Cullimore admits that *Huang* alone does not teach the limitation, and argues only that an alleged combination of Huang and Shenfield discloses the claim element. *See* Ex. 1002 ¶¶ 179-90. I agree with Dr. Cullimore that Huang alone does not teach the *claimed* Player, or an authoring tool that is configured to “produce a Player” as claimed.

53. I disagree with Dr. Cullimore that it would be obvious to modify Huang’s “designer,” (what he opines is the authoring tool), to produce the claimed Player. *See* Ex. 1002 ¶ 189. A POSA would not be motivated nor find it obvious to make such a modification. Huang does not disclose, suggest, or render obvious that its designer 104 does (or could be modified to) produce the claimed Player. Huang’s designer 104 is an “Application Designer” and is referred to as such throughout the specification. *See id.* at Figs. 1A, 2A, 2B, 7, ¶¶ 014, 015, 020, 067, 078, 103, 104, 105, 114, 118, 133. Moreover, a POSA would understand that Huang’s designer 104 cannot produce the player 106. The purported authoring tool (designer 104) and the

purported player (player 106) are both provided to the browser by the intermediary server 120. Huang at ¶ 41. After receipt, the designer 104 executes on the web browser. *Id.* at ¶ 41, Fig. 1A. A POSA would understand that the designer 104 would “produce” the player 106 in the server, before it is even executed. I note that Dr. Cullimore does not address these deficiencies at all.

54. Dr. Cullimore asserts that one reason the POSA would have combined Huang and Shenfield to produce a player because Huang’s “designer already generated code in the form of applications, thus indicating that it can also produce code in the form of players.” Ex. 1002 ¶ 189. I disagree with Dr. Cullimore that because designer 104 is configured to generate one type of software, it would be easy or obvious to modify it to produce any other type of software for at least the reason that offering such a conclusion is based on hindsight. *See id.* Moreover, in my opinion, A POSA would not find it obvious or be motivated to significantly retool designer 104 to also produce a different type of software. Huang discloses the web browser receiving player 106 from server 120. Huang at ¶ 41. As the browser receives player 106 from server 120, there would be no reasonable motivation to modify Huang so that a designer running on the browser would reproduce a player 106 that is already available, and Dr. Cullimore provides none. Moreover, generating a player is an entirely different and much more difficult undertaking than producing an application. Huang states that “Applications created by the Designer 104 are

stored in Extensible Markup Language (XML) format as XML definitions 122 in a database 124, and loaded into the Player 106 as the application 111.” Huang at ¶1042. Saving data in XML format is fundamentally different from and significantly simpler than generating Java Server Pages (JSP) or JavaScript that implements a player especially code for a Player with the additional requirements of the claims (e.g., the inclusion of device dependent code). Neither the idea of using Designer 104 to generate JSP/JavaScript nor how to do so is disclosed anywhere in Huang. Dr. Cullimore does not explain how this wholesale change can be made to Huang’s designer 104 and why such change would not break existing functionality of the designer. A POSA would not be motivated to create a whole new designer that can simultaneously generate XML definitions for an application and JSP/JavaScript for a player. Dr. Cullimore opines that a POSA would be motivated to “leverage an already existing resource in Huang” (¶ 189), but fails to explain how any resource in Huang’s designer 104 could be leveraged to produce a player. Indeed, no resources would be leveraged: to produce a player—software completely different than the application—designer 104 require a wholesale redesign. That is, a designer would have to start from scratch and reproduce an entirely different designer 104. As such, Petitioner’s proposal would actually waste resources by discarding the functionality already made available by Huang’s designer 104. For these reasons, it is my opinion that Huang does not disclose or render obvious this limitation.

55. Moreover, to the extent that Dr. Cullimore asserts that the POSA “would have been motivated to substitute *Huang*’s players with *Shenfield*’s players written in device-specific code that can provide instructions tailored to optimize the display of content specified in *Huang*’s device-independent applications for each runtime environment” (¶ 185), I disagree. The POSA would have been discouraged from substituting the player taught in *Huang* with *Shenfield*’s purported “players,”¹ which Dr. Cullimore relies on for alleged disclosures of a device-dependent player. As discussed above, the application player in *Huang* runs within a browser 101, as Figures 1A and 1D of *Huang* confirm. This, including the claim language among other disclosures, underscores that the application (and associated Player) discussed in *Huang* is fundamentally “browser-based.” *Huang* at Claim 1 (“wherein the accessing is via a web browser”), FIGS. 1A, 1D, & ¶ 40 (“The Player 106 is a browser based application 111”). This is in direct contrast to *Shenfield*, which *discourages* the POSA from using a browser-based application, and in fact encourages conversion *away from* such applications to a component-based applications. *Shenfield* at ¶ 5 (“[A] method is disclosed for converting a page-based [browser-based] application to a component based application configured for execution on a devices”); *id.* ¶ 53 (“Unlike browser-based applications 107 that

¹ I do not agree that *Shenfield* teaches a Player, as claimed, although Dr. Cullimore attempts to apply that label to *Shenfield*’s teachings.

require a Web Server to host additional components . . . to connect HTML pages data/requests with a service endpoint, the component application model allows end-to-end direct connectivity.”). Because Shenfield is about the conversion of browser-based applications to component-based ones and discourages the use of the browser-based applications taught in Huang, the POSA with Huang would have been discouraged from combining Huang with Shenfield. Moreover, it is my opinion that Huang and Shenfield are fundamentally different in their operation, and that combining Huang with Shenfield would undermine Huang’s principle of operation.

56. Even assuming that the POSA might have had a motivation to combine Huang with Shenfield (and I do not agree there would have been such a motivation), the POSA would have not combined Huang with Shenfield in a manner that meets the requirements of the “produce a Player” limitation. In my opinion, Dr. Cullimore’s opinion in this regard is purely based on hindsight and reinforces my opinion that Huang alone does not teach the “produce a Player” limitation. As noted above, nothing identified as a “Player” is taught in Shenfield, and Dr. Cullimore simply adds that label to certain teachings of Shenfield, which have no connection whatsoever to the claim requirements of the “Player” recited and claimed in the ’755 patent. On examination of paragraphs 185 through 189, Dr. Cullimore suggests that Shenfield’s disclosures include device-dependent code and are somehow “similar” to Huang so as to motivate a combination, but he does not explain how there is any

similarity whatsoever between Huang’s browser-based application and Shenfield’s *converted*, non-browser based application. This is why, as Dr. Cullimore eventually admits, “the modified *Huang-Shenfield* system would utilize a player that operates *in the native runtime environment and would not rely on a web browser.*” Ex. 1002 ¶ 205 (emphasis added). Therefore, the POSA attempting to combine Huang with Shenfield would lose all the advantages of browser-based application taught in Huang, which furnishes yet another reason the POSA would not combine them.²

57. As noted above, moreover, Shenfield’s focus on application conversion undermines the combination. Dr. Cullimore avoids the conversion issue entirely because that issue underscores that Shenfield is not about a Player that interacts with an application. It is nothing more than a converted Application. Shenfield does not have a separate “Application” and “Player,” but instead just teaches a pre-conversion “Application” and a post-conversion “Application.” This is yet another reason that

² Dr. Cullimore appears to acknowledge this problem, separately suggesting that *Shenfield*’s invention could be run in browsers because its component applications can be “executed as native code or interpreted by another software module” (Ex. 1002 ¶ 185), but there is nothing in Shenfield or in this disclosure that would suggest to a POSA that Shenfield’s application should be run in a browser. To the contrary, the disclosures of Shenfield collectively demonstrate that the component applications were precisely meant to be non browser-based to achieve the advantages of the invention.

a POSA would not have been motivated by Shenfield to include the claimed “Player” within Huang, let alone one that is “produced by” the authoring tool as claimed. As noted above, the “designer” of Huang does not produce any Player code, and Shenfield does not have any authoring tool that would be understood to produce any such Player code even if it existed, since Shenfield is nothing more than a converter between a page-based, browser application and a component-based one.

58. In sum, Huang in view of Shenfield would not be understood to render the “produce a Player” limitation obvious for a litany of independent reasons that I have discussed above, including but not limited to the fact that the POSA would have been discouraged from combining the references in the first place.

59. Finally, in connection with this limitation, I have reviewed the October 4, 2021 Institution decision in *Google LLC v. Express Mobile, Inc.*, IPR2021-00709 (Paper 7), which denied institution of an IPR ground against the ’755 patent involving Huang as a primary reference. I rendered similar opinions regarding Huang in that proceeding. In the decision denying institution, the Board (correctly, in my view), concluded that “the player disclosed by Huang is sent from server 120 to browser 101 (which executes the player and the Application Designer), not produced by the Application Designer,” and Google (the Petitioner) there, admitted as much. *Id.* at 13. I agree with the Board’s decision that “Huang does not disclose how the designer or any other resource of Huang would produce a player,” and note

further that nothing in Shenfield referenced by Dr. Cullimore cures this deficiency for the numerous reasons I stated above.

D. Huang and Shenfield fail to disclose or render obvious “said Player receives the output symbolic name.”

60. In my opinion, Huang in view of Shenfield fails to disclose or render obvious this element. Claim 1 of the '755 patent requires that the “web service” utilize the input symbolic name from the device “for generating one or more output values having an associated output symbolic name.” '755 patent at claim 1. As discussed above, the combination does not teach or render this limitation obvious, quite independent from the requirement of a “Player.” Additionally, the combination of Huang in view of Shenfield does not teach or render obvious the “producing a Player limitation,” as discussed above, as the combination does not include the *claimed Player* or teach the *production* of such a Player. For these reasons alone, Huang and Shenfield do not render this claim limitation obvious alone or in combination.

61. Even if the combination of Huang and Shenfield properly disclosed the production of a Player as claimed, this Claim limitation *also* requires that “***said Player*** receives the output symbolic name.” '755 patent at claim 1 (emphasis added). A POSA would understand that Huang in view of Shenfield does not disclose this functionality or render it obvious. I reviewed the petition and the declaration of Dr. Cullimore, and I note neither that Petitioner or Dr. Cullimore identify any disclosure

of Huang or Shenfield that teaches any purported Player receiving any purported output symbolic name. *See generally* Ex. 1002 ¶¶ 203-211. To the extent that Dr. Cullimore cites anything, he cites references that discuss the possibility of querying a web service “value,” which might be displayed, along with other generic citations. *See* Ex. 1002 ¶ 203 (citing Ex. 1005, ¶¶ 57, 70). These generic citations (and the others cited by Dr. Cullimore) do nothing to link Huang’s disclosures to an “output symbolic name,” let alone a connection between any Player in Huang and an output symbolic name as claimed. This is also true with respect to Figure 1A and Dr. Cullimore’s assertion that Huang “mediates” the communications between the Application and a web service. *See* Ex. 1002 ¶¶ 206-207. Indeed, the annotated version of Figure 1A on page 128 of Dr. Cullimore’s declaration reinforces that Huang’s Player, at most, mediates communications between the *Application Server* and the application (as shown with the red circle)—not communications between the application and the web service. Moreover, this Figure and associated disclosures likewise have no relation to the Player’s receipt of an “output symbolic name” or the web service architecture recited in the ’755 patent. This simply reinforces that, in *Huang*, the purported device has no knowledge of web service specificities and a POSA would understand that it would not be obvious to provide the output symbolic name discussed in the web service element of the claim to the player.

62. In paragraph 211, Dr. Cullimore implicitly acknowledges the deficiencies of this limitation based on Huang alone, and asserts that this limitation would have been obvious based on the combination of Huang and Shenfield. But as noted above, the POSA would not even have combined these references for the reasons given above. Moreover, Dr. Cullimore's only reference to Shenfield in connection with this limitation is to a portion that references "message processing" and "instructions" in connection with Shenfield's "workflow components." *See* Ex. 1002 (citing Ex. 1007 at ¶ 45). This teaching in Shenfield has nothing to do with the receipt of output symbolic names by anything, let alone the claimed Player or associated web services, and Dr. Cullimore simply makes generic, conclusory statements about how these teachings relate to the display of outputted messages. Moreover, Dr. Cullimore provides no explanation of how or why this teaching would have motivated the POSA to combine the references in a manner that meets this limitation. In my opinion, therefore, the combination of Huang and Shenfield would not render this claim limitation obvious, even if the references were somehow combined.

63. Finally, in connection with this limitation, I have reviewed the October 4, 2021 Institution decision in *Google LLC v. Express Mobile, Inc.*, IPR2021-00709 (Paper 7), which denied institution of an IPR ground against the '755 patent involving Huang as a primary reference. I rendered similar opinions regarding

Huang in that proceeding. In the decision denying institution, the Board (correctly, in my view), found that this limitation was not taught by Huang. *See id.* at 15-16. I again agree.

VIII. ANALYSIS OF DEPENDENT CLAIMS 3, 5-7, 11-12, 14, 16-18, AND 22

64. I understand that the remaining claims of the petition, claims 3, 5-7, 11-12, 14, 16-18, and 22, either depend from claim 1 or a claim that depends from claim 1, or from claim 12 or a claim that depends from claim 12. While my analysis above was focused on independent claim 1, I have reviewed independent claim 12 and note that that claim is substantially identical to claim 1 with respect to the limitations I have analyzed above. I further note that, for the relevant limitations of claim 12, Dr. Cullimore incorporates his analysis from each corresponding limitations of claim 1 that I analyzed above and asserts that the limitations are obvious “for the same reasons [he] discussed above.” *See* Ex. 1002 ¶¶ 242, 243. Meanwhile, I understand that a dependent claim includes all limitation of the claim(s) from which it depends. Thus, claims 3, 5-7, 11, 14, 16-18, and 22 each include all limitations of claim 1 or (equivalent limitations of claim 12) that I have analyzed above. As I’ve discussed, it is my opinion that Huang in view of Shenfield fails to disclose or render obvious the elements of claim 1 that I have discussed above. As such, Huang in view of Shenfield fails to disclose or render obvious claims 3, 5-7, 11-12, 14, 16-18, and 22.

IX. LEGAL STANDARDS

65. In preparing my analysis, I have applied the legal standards described below, which were provided to me by counsel for Express Mobile.

66. It is my understanding that assessing the validity / patentability of a U.S. patent claim based on a prior art analysis requires two essential steps. First, one must construe the terms of the patent claims to understand what meaning one of ordinary skill in the art would give the terms. Second, after the claim terms have been construed, one may then assess validity by comparing a patent claim to the “prior art.” I understand that the teaching of the prior art is viewed through the eyes of a person of ordinary skill in the art at the time the invention was made. My opinion as to what constitutes a relevant person of ordinary skill in the art is set forth above.

67. I understand that a patent claim is invalid as obvious if the subject matter “as a whole” of the claimed invention would have been obvious to a person of ordinary skill in the field at the time the invention was made. In determining the differences between a prior art reference (or a proposed combination of prior art references) and the claims, the question of obviousness is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. I also understand that obviousness grounds cannot be sustained by mere conclusory statements, and that, instead, there must be some

articulated reasoning with rational underpinning to support the legal conclusion of obviousness.

68. I understand that merely demonstrating that each of a claim's elements was independently known in the prior art is not enough to prove the claim is obvious. In evaluating whether any claim of the patent would have been obvious, I considered whether the evidence submitted in this proceeding presented an articulated reason with a rational basis that would have prompted a person of ordinary skill in the field to combine the elements or concepts from the prior art in the same way as in the claimed invention.

69. I understand that there is no single way to define the line between true inventiveness on 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.

70. It is my understanding that the decision-maker may consider whether 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. And, the decision-maker may also consider whether there is some teaching or suggestion in the prior art to make the modification or combination of elements recited in the claim at issue. Also, the decision-maker may consider whether the innovation applies a

known technique that had been used to improve a similar device or method in a similar way. The decision-maker may also consider whether 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.

71. I have been instructed by counsel that if any of these considerations are relied upon to reach a conclusion of obviousness, the law requires that the analysis of such a relied-upon consideration must be made explicit. I understand that the decision-maker must be careful not to determine obviousness using the benefit of hindsight and that many true inventions might seem obvious after the fact. I understand that the decision-maker should consider obviousness from the position of a person of ordinary skill in the relevant field at the time the claimed invention was made and that the decision-maker should not consider what is known today or what is learned from the teaching of the patent.

72. I understand that in order to determine whether a patent claim is obvious, one must make certain factual findings regarding the claimed invention and the prior art. Specifically, I understand that the following factors must be evaluated to determine whether a claim is obvious: (1) the scope and content of the prior art; (2) the difference or differences, if any, between the claim of the patent and the prior

art; (3) the level of ordinary skill in the art at the time the claimed invention was made; and (4) the objective indicia of non-obviousness (if available).

X. ADDITIONAL REMARKS

73. This declaration reflects my opinions as currently held. However, my analysis may continue such that I may consider additional information that may result in additional observations.

74. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true and that such statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both.

Executed on October 25, 2021, at Santa Barbara, CA.



Kevin C. Almeroth