

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TWITTER, INC.,
Petitioner,

v.

PALO ALTO RESEARCH CENTER INC.,
Patent Owner.

IPR2021-01430
Patent 9,208,439 B2

Before KARL D. EASTHOM, SHEILA F. McSHANE, and
CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.

OGDEN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner Twitter, Inc. (“Twitter”)¹ filed a Petition (Paper 2, “Pet.”) under 35 U.S.C. §§ 311–319 requesting *inter partes* review of claims 1–5, 7–11, 13–17, 19, and 20 of U.S. Patent No. 9,208,439 B2 (Ex. 1001, “the ’439 patent”). Patent Owner Palo Alto Research Center Inc. (“PARC”)² filed a Preliminary Response (Paper 9, “Prelim. Resp.”).

Under the authority delegated to us by the Director under 37 C.F.R. § 42.4(a), we may institute an *inter partes* review when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); *see also* 37 C.F.R. § 42.108(c) (2020). Applying that standard, we institute an *inter partes* review of all the challenged claims of the ’439 patent for the reasons explained below. This is a preliminary decision, and we will base our final written decision on the full trial record, including any timely response and evidence by PARC.

II. BACKGROUND

A. RELATED PROCEEDINGS

Both parties are involved in the following related U.S. district court case: *Palo Alto Research Center Inc. v. Twitter, Inc.*, No. 2-20-cv-10754-AB (C.D. Cal. filed Nov. 25, 2020). Pet. 12; Paper 5, 2. According to Twitter, the

¹ Twitter identifies itself as the only real party in interest. Pet. 12.

² PARC identifies itself and its parent companies Xerox Corp. and Xerox Holdings Corp. as the real parties in interest. Paper 5, 2.

court granted a stipulated stay of the district court proceeding. Pet. 82 (citing Ex. 1021 (granting joint request to stay proceedings)). The parties also identify the following two related matters: *Palo Alto Research Center Inc. v. Snap Inc.*, No. 2:20-cv-10755-AB (C.D. Cal. filed Nov. 25, 2020); *Palo Alto Research Center Inc. v. Facebook, Inc.*, No. 2:20-cv-10753-AB (C.D. Cal. filed Nov. 25, 2020). Pet. 12; Paper 5, 2–3. We refer to the above three proceedings as the “related district court proceedings.”

As PARC notes, the ’439 patent is also the subject of *inter partes* reviews IPR2021-00986 (instituted November 23, 2021) and IPR2021-01461. Paper 5, 3. The Board instituted trial in IPR2021-00986 on November 23, 2021. *See* IPR2021-00986, Paper 11.

B. THE ’439 PATENT (EX. 1001)

The ’439 patent issued on December 8, 2015 from an application filed on April 29, 2013. Ex. 1001, codes (22), (45). It relates to “a method and system for collecting mobile device contextual information and facilitating efficient adaptation of a generic contextual intelligence system for customized applications.” Ex. 1001, 1:8–12. A context-aware system on a mobile device detects the computing environment, and the system may recommend activities, such as leisure activities, based on a user model. *Id.* at 1:22–23, 1:30–31.

Figure 6, reproduced below, is a flowchart illustrating the steps of processing an event. *Id.* at 2:23–25.

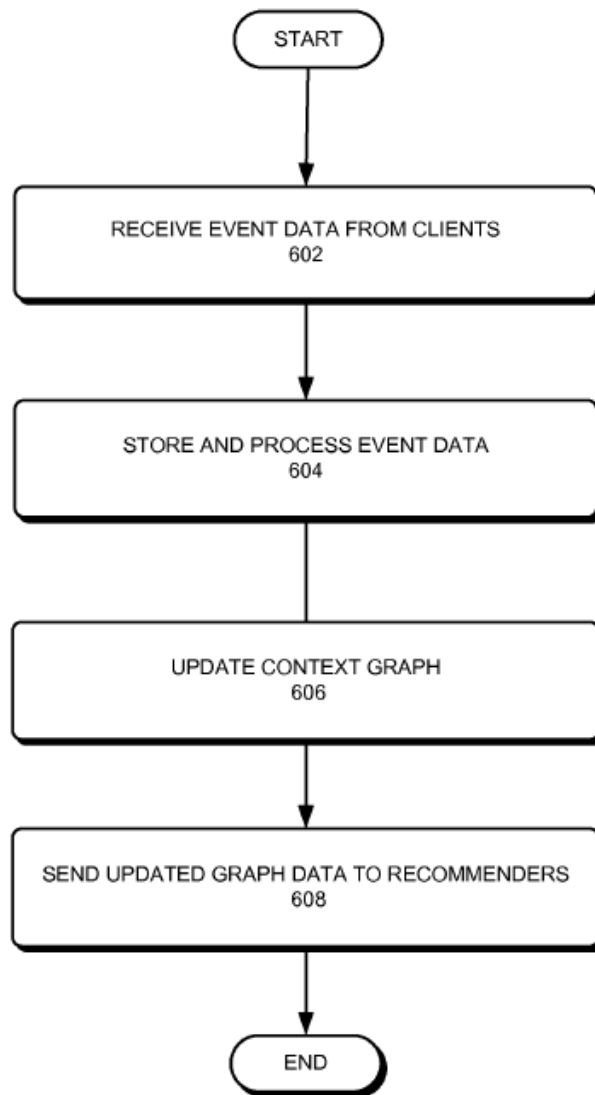
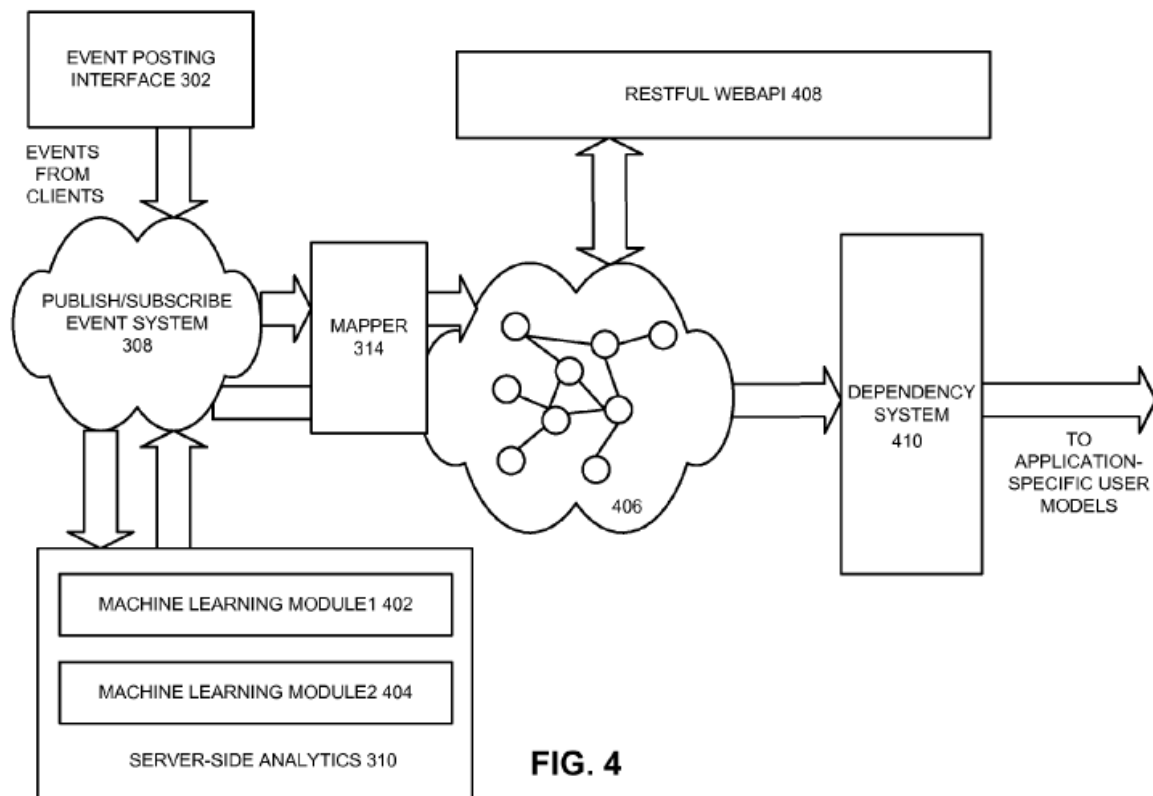


FIG. 6

As shown in Figure 6, above, a server receives event data from clients (operation 602), and then stores and processes the event data (operation 604). Ex. 1001, 9:13–19. The server then analyzes the event data and uses it to update a “context graph” (operation 606). *Id.* at 9:19–24. Next, the server sends the context graph data, and changed graph data, to relevant “recommenders” (operation 608). *Id.* at 9:26–29.

According to the '439 patent, “[a] context graph is an in-memory model that stores facts and assertions about a user’s behavior and interests.” *Id.* at 3:20–22. “A recommender is an application that recommends items or activities for a user.” *Id.* at 3:23–25.

Figure 4, reproduced below, is a block diagram of an embodiment that illustrates a relationship between events, a mapper, and a context graph. Ex. 1001, 6:59–61.



As shown in Figure 4, event posting interface 302 sends events received from clients to publish/subscribe event system 308. Ex. 1001, 7:7–9. Based on subscriptions to publish/subscribe event system 308, mapper 314 uses the event data to modify context graph 406. Ex. 1001, 7:7–9, 7:44–47. “Context graph 406 functions as a storage component of a generalized user model. A

user model describes predicted current and future activities and interests for a user.” *Id.* at 7:34–36.

C. CHALLENGED CLAIMS AND ASSERTED GROUNDS OF
UNPATENTABILITY

Claims 1, 7, and 13 of the ’439 patent are independent. Claim 13, representative of the challenged claims, reads as follows:

13. A computing system comprising:
- [a] one or more processors,
 - [b] a non-transitory computer-readable medium coupled to the one or more processors having instructions stored thereon that, when executed by the one or more processors, cause the one or more processors to perform operations comprising:
 - [c] receiving, from a mobile device, event data derived from contextual data collected using detectors that detect a physical context surrounding the mobile device;
 - [d] modifying a context graph that stores facts and assertions about a user's behavior and interests using the event data;
 - [e] in response to determining that there exists a registration for notification of changes that matches the modification to the context graph, sending a notification of context graph change to a recommender.

Ex. 1001, 11:47–12:7 (Twitter’s reference letters added in brackets).

Twitter argues six grounds for *inter partes* review, as summarized in the following table:

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–4, 7–10, 13–16	103 ³	Huomo ⁴
2	1–4, 7–10, 13–16, 20	103	Huomo, Cheng ⁵
3	5, 11, 17	103	Huomo, Lawson ⁶
4	5, 11, 17	103	Huomo, Cheng, Lawson
5	19	103	Huomo, Chauhan ⁷
6	19	103	Huomo, Cheng, Chauhan

Pet. 13–14.

D. DECLARATORY TESTIMONY

Twitter relies on the declaration of Dr. Don Turnbull (Ex. 1003). *See* Pet. 14. PARC does not challenge Dr. Turnbull’s qualifications to provide expert testimony, and does not submit rebuttal testimony at this stage.

Twitter also relies on the declaratory testimony of Sayem Osman to authenticate Exhibits 1001, 1002, 1004–1013, 1018, 1019, 1021, and 1022. *See* Ex. 1014. PARC does not contest this testimony at this stage.

III. GROUNDS OF THE PETITION

For the reasons below, we determine that there is a reasonable likelihood that Twitter would prevail in showing that at least one of claims 1–5, 7–11, 13–17, 19, and 20 of the ’439 patent is unpatentable under the grounds raised in the Petition. Before analyzing those grounds in detail, we

³ 35 U.S.C. § 103 (2018).

⁴ Huomo et al., US 7,603,112 B2 (issued Oct. 13, 2009) (Ex. 1004).

⁵ Cheng, US 2013/0018954 A1 (published Jan. 17, 2013) (Ex. 1005).

⁶ Lawson et al., US 2011/0320550 A1 (published Dec. 29, 2011) (Ex. 1006).

⁷ Chauhan et al., US 2010/0262650 A1 (published Oct. 14, 2010) (Ex. 1007).

first address the level of ordinary skill in the art, and whether we need to construe any claim terms explicitly for our analysis.

A. LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the pertinent art at the time of the invention is relevant to how we construe the patent claims. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). It is also one of the factual considerations relevant to obviousness, *see Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966), and it is relevant when considering whether a reference anticipates a claimed invention, *see In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

To assess the level of ordinary skill, we construct a hypothetical “person of ordinary skill in the art,” from whose vantage point we assess obviousness and claim interpretation. *See In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). This legal construct “presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan.” *Id.* (citing *In re Carlson*, 983 F.2d 1032, 1038 (Fed. Cir. 1993)).

Relying on Dr. Turnbull’s testimony, Twitter argues that a person of ordinary skill in the art “would at minimum have a bachelor’s in software, computer, or electrical engineering or computer science with at least two years’ experience in software development, including with respect to context-aware devices and systems, or the equivalent.” Pet. 16 (citing Ex. 1003 ¶ 24). Also, “[a]dditional graduate education could substitute for professional experience, or significant experience in electronic messaging could substitute for formal education.” *Id.* (citing Ex. 1003 ¶ 24)

PARC does not dispute this proposed level of ordinary skill in its Preliminary Response. We adopt Twitter’s proposed articulation of the level of ordinary skill for this decision because it is supported by testimonial evidence and appears reasonable in light of the subject matter of the ’439 patent. If PARC proposes a different articulation at trial, we will consider that proposal and any supporting evidence in light of the full trial record.

B. CLAIM CONSTRUCTION

In an *inter partes* review, we construe a patent claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2020). This includes “construing the claim 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.” *Id.* The ordinary and customary meaning of a claim term “is its meaning to the ordinary artisan after reading the entire patent,” and “as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1313, 1321. We also consider “[a]ny prior claim construction determination concerning a term of the claim in a civil action . . . that is timely made of record” in this proceeding.

37 C.F.R. § 42.100(b).

Twitter contends that the ’439 patent explicitly defines two terms as follows: (1) a “context graph” is “an in-memory model that stores facts and assertions about a user’s behavior and interests,” and (2) a “recommender” is “an application that recommends items or activities for a user.” Pet. 15 (emphasis omitted) (quoting Ex. 1001, 3:20–25) (citing Ex. 1002, 108). Twitter also contends that we should construe the term “application event

data and/or operating system event data” of dependent claims 2, 8, and 14 to mean “event data that indicates user events occurring within an application or operating system and that is derived from information collected using detectors other than those that detect a physical context surrounding the mobile device.” Pet. 15–16 (emphasis omitted) (citing Ex. 1001, 4:24–25, 4:36–38, 4:19–21, 5:36–39, 10:41–50).

In its Preliminary Response, PARC does not contest Twitter’s proposed constructions for the three terms. Because these terms are not in controversy and are not material to our decision to institute an *inter partes* review, we need not adopt Twitter’s proposed constructions at this stage. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 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))).

C. GROUNDS BASED ON HUOMO AND CHENG (GROUNDS 2, 4, 6)

In its second, fourth, and sixth grounds, Twitter contends that claims 1–4, 7–10, 13–16, and 20 are unpatentable as obvious over Huomo in view of Cheng, and for claims 5, 11, and 17, further in view of Lawson, and for claim 19, further in view of Chauhan. Pet. 13–14, 25–82.

A claim is unpatentable under § 103 for obviousness 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 the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

For a combination of known elements that are not explicitly found together in the prior art, we consider “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *Id.* at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). A successful petition must “articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (citing *KSR*, 550 U.S. at 418); *see also* 35 U.S.C. § 322(a)(3); 37 C.F.R. §§ 42.22(a)(2), 42.104(b)(4).

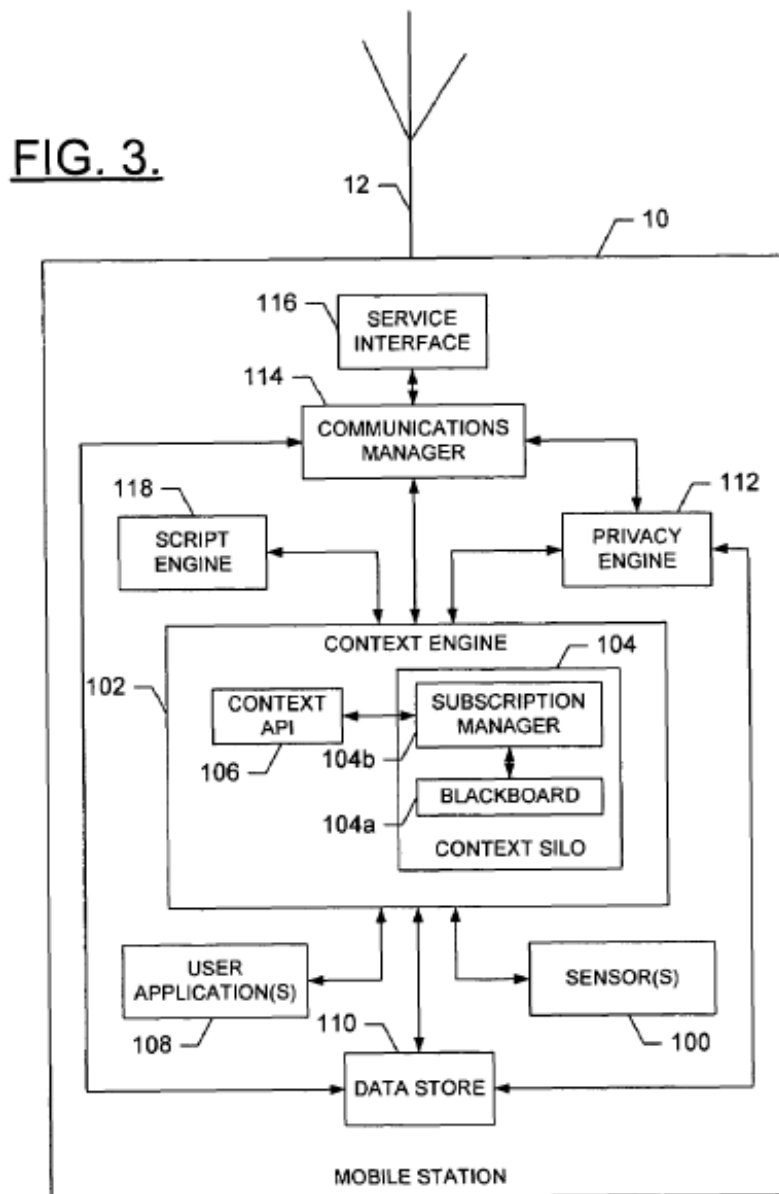
We base our obviousness inquiry on factual considerations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) any objective indicia of obviousness or non-obviousness that may be in evidence.⁸ *See Graham*, 383 U.S. at 17–18.

Based on these factors, we conclude that Twitter has made a sufficient showing that each of the challenged claims would have been obvious over *Huomo* in view of *Cheng* and the other references. Thus, for the reasons below, we determine that Twitter is reasonably likely to prevail on Grounds 2, 4, and 6 relying on both *Huomo* and *Cheng*.

⁸ At this stage, the parties do not identify any objective indicia of obviousness or non-obviousness, so this does not factor into our decision to institute an inter partes review. *See* Pet. 82 (“[Twitter] is aware of no evidence from [PARC] of secondary considerations with a nexus to ’439.”); *see generally* Prelim. Resp. (not alleging any evidence of indicia of nonobviousness).

1. Overview of *Huomo*

Huomo describes a system and method for “managing context-related information” that can “facilitat[e] the exchange and sharing of context-related information” by “provid[ing] application program interfaces (API’s) for applications that can then use, publish, and subscribe to context-related information” over a network. Ex. 1004, 2:28–37. This system includes a mobile station as depicted in Figure 3, which is reproduced below:



As shown above, Huomo's Figure 3 is "a schematic block diagram of a context exchange architecture within a mobile station." Ex. 1004, 3:31–32. Mobile station 10 can be, for example, a mobile phone, a portable digital assistant, or pager. *Id.* at 3:56–65. It includes sensors 100, which measure data and preprocess it to form a "context atom," which is "a specific piece of context-related information." *Id.* at 7:22–28. "For example, a temperature sensor can measure the ambient temperature of the environment around the mobile station 10, and thereafter process the temperature into a context atom." *Id.* at 7:35–38.

Within mobile station 10, context engine 102 "is capable of receiving, and thereafter storing, the context atoms, as well as providing access to the context atoms." Ex. 1004, 7:50–52. Context 102 engine includes blackboard 104a and subscription manager 104b. *Id.* at 7:54–56. Blackboard 104a is "a storage unit for context-related information and, as such, typically stores the context atoms received from the sensors or other context sources (such as other electronic devices . . .)." *Id.* at 7:56–60. Subscription manager 104b "provide[s] subscriptions to various of the context atoms and/or notifications when such context atoms change." *Id.* at 7:62–64.

Huomo's Figure 4 is reproduced below:

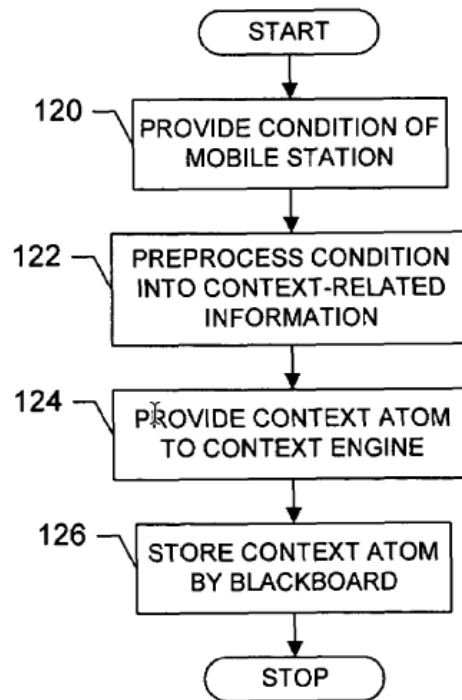


FIG. 4.

Huomo's Figure 4, above, is a "flowchart illustrating the steps in a method of creating context-related information and thereafter making the context-related information available to context consumers." Ex. 1004, 3:34–37. In this method, mobile station 10 measures or senses data about its condition (step 120). Ex. 1004, 11:27–30. The system then preprocesses this condition data to create context-related information (step 122) and packages the context-related information into a "context atom" (step 124) which the mobile station 10 then stores in its blackboard 104a (step 126). *Id.* at 11:30–41.

2. Overview of Cheng

Cheng describes “[a] method for constructing user models from user usage and context data . . . derived from one or more sensors of an electronic device.” Ex. 1005, code (57). “The personal interest graph can be modified by annotating one or more nodes of the personal interest graph with influence information.” *Id.*

Figure 2 of Cheng is reproduced below:

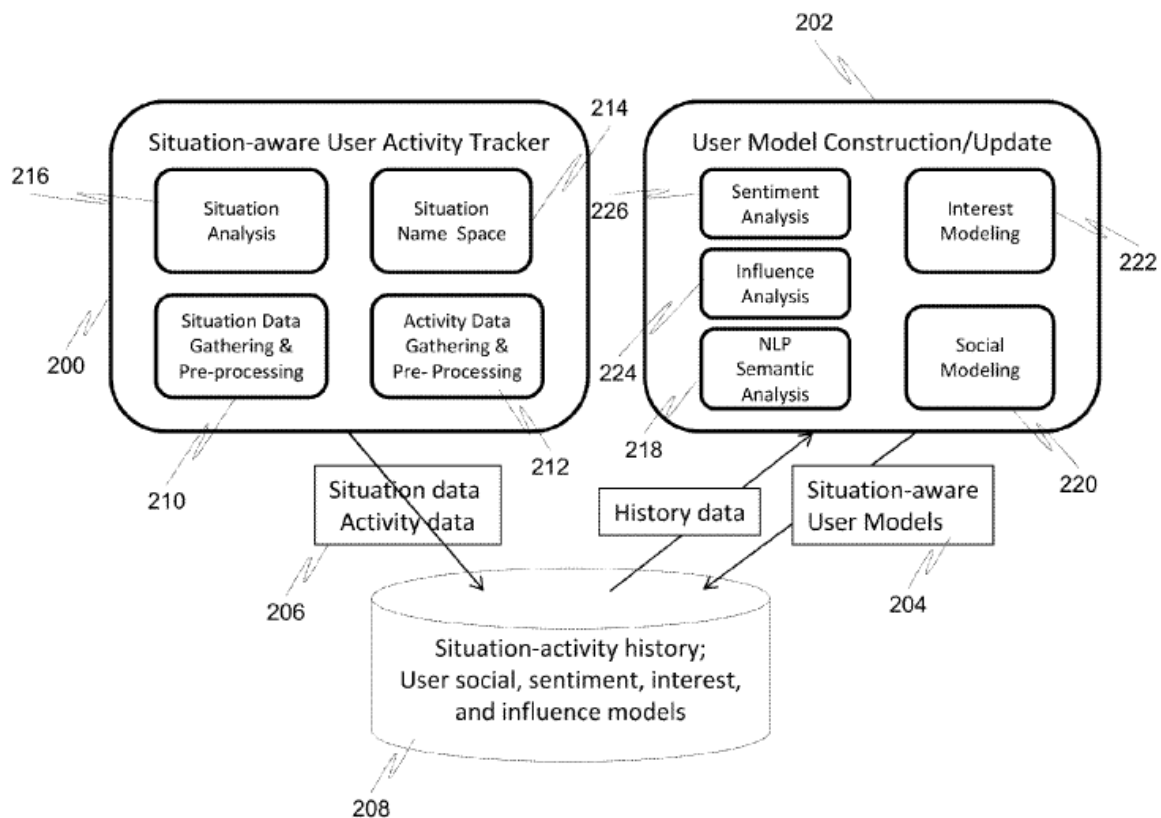


FIG. 2

Cheng’s Figure 2, above, depicts the high-level architecture of this system, which has two main parts: (1) situation-aware user activity tracker 200, which logs user activity data within a device and application, and corresponding situation data at the time of usage; and (2) user model

construction/update module 202, which “builds and updates user models.” Ex. 1005 ¶ 37. Storage 208 stores the user’s annotated “relations, interests, influence, and sentiments.” *Id.* “[T]he output of the system is a set of models 204 about the user’s relationship, interests, who influences the user about a topic, whom the user influences about a topic, and the user’s sentiments towards a topic/concept or person.” *Id.*

3. *Claim 13*

Twitter’s analysis focuses first on claim 13. Pet. 25. Likewise, we begin our analysis with claim 13, followed by a discussion of the other claims.

(a) Preamble and limitations 13[a]–[c]

The preamble of claim 13 recites “[a] computing system.” Ex. 1001, 11:47. Twitter argues that, “[t]o the extent deemed limiting,” *Huomo* discloses this preamble. Pet. 26–28 & n. 5 (citing Ex. 1003 ¶¶ 86–92; Ex. 1004, 1:18–21, 2:27–37, 2:57–67, 4:6–19, Figs. 1–3).

Limitation 13[a] recites “one or more processors” and limitation 13[b] recites “a non-transitory computer-readable medium coupled to the one or more processors having instructions stored thereon that, when executed by the one or more processors, cause the one or more processors to perform operations.” Ex. 1001, 11:53–56. Twitter contends that *Huomo* discloses these limitations. *See* Pet. 28–34 (citing Ex. 1003 ¶¶ 93–116, Ex. 1004, 2:27–30, 2:57–67, 3:53–4:19, 4:55–5:7, 5:10–14, 5:31–62, 6:2–19, 6:23–29, 7:12–48, 9:8–15, 10:56–11:9, 15:28–41, 15:45–49, 16:42–17:20, 24:1–27, Figs. 1–3).

Limitation 13[c] requires that one of the operations that a processor will perform is “receiving, from a mobile device, event data derived from contextual data collected using detectors that detect a physical context surrounding the mobile device” Ex. 1001, 11:54–56. Twitter contends that Huomo discloses this limitation. Pet. 35–42 (citing Ex. 1003 ¶¶117–135; Ex. 1004, code (57), 2:57–67, 3:1–17, 3:53–4:19, 4:55–5:7, 5:13–15, 5:63–6:2, 6:23–29, 6:47–7:3, 7:12–60, 8:46–64, 9:8–15, 10:56–11:53, 12:9–20, 13:61–14:6, 15:28–41, 15:42–49, 16:42–53, Figs. 1–2, 4).

PARC does not dispute that Huomo discloses the preamble of claim 13 or limitations 13[a]–[c]. Without deciding whether the preamble is limiting, we find Twitter’s arguments sufficiently persuasive at this stage.

(b) Limitation 13[d]

Limitation 13[d] recites “modifying a context graph that stores facts and assertions about a user's behavior and interests using the event data.” Ex. 1001, 12:1–3. To the extent the recited “context graph” does not read on Huomo’s “context atoms,”⁹ Twitter argues that Cheng discloses a context graph. Pet. 45–54 (citing Ex. 1003 ¶¶ 149–163; Ex. 1005 ¶¶ 3–15, 30, 37, 38, 40, 42, 44, 45, 53, 55, Figs. 2, 4–10). According to Twitter, Cheng’s personal interest graph reflects “interests of the user derived from usage data and situational data derived from one or more sensors.” Pet. 53–54 (quoting

⁹ In its Preliminary Response, PARC contends that Huomo’s “context atoms” cannot be both the “event data” recited in limitation 13[c] and the “context graph” recited in limitation 13[d]. *See* Prelim. Resp. 17–18. We do not need to reach the issue of whether Twitter is reasonably likely to prevail on that issue because, as we discuss below, we find sufficiently persuasive Twitter’s arguments based on the combination of Huomo and Cheng. *See infra* part III.D.

Ex. 1005, code (57)). Twitter also argues that Cheng’s personal interest graph is an in-memory model as per its proposed construction of the term “context graph.” *Id.*

Twitter contends that a person of ordinary skill in the art would have had reason “to implement Huomo’s context engine, which stores context atoms in a blackboard that is modified when context atoms change, using Cheng’s beneficial teachings of a context graph as the model for formally organizing Huomo’s blackboard information.” Pet. 54. According to Twitter, “Cheng discloses that using a context graph beneficially and better facilitates taking into account users’ shared interests and how a user may influence other users in various domains (such as when shopping with a friend, as Huomo discloses).” *Id.* (citing Ex. 1005 ¶ 30). Twitter also argues that according to Cheng, “use of a context graph allows for better tracking of social relationships through the annotation of nodes and edges,” and this would have “allow[ed] for more facile manipulation and modeling of the data stored [in Huomo’s blackboard], including with respect to the ability to provide recommendations to the system.” Pet. 54–55 (citing Ex. 1005 ¶¶ 11, 30, 44). Twitter contends that for a person of ordinary skill in the art, “it would have been routine to make such an implementation choice, and (particularly given Cheng’s express teachings) [it would have been] clear [that] it would work and provide the expected functionality to yield predictable results with [a reasonable expectation of success].” Pet. 55 (citing Ex. 1003 ¶¶ 156–161).

In its Preliminary Response, PARC argues that neither Huomo nor Chang discloses a context graph that stores both “facts and assertions.” *See* Prelim. Resp. 17–19. According to PARC, there is a distinction between a

“fact” and an “assertion” and, for example, “an assertion about user behavior and actions includes things like ‘a user tends to drink coffee at four o’clock, or that the user tends to go to work at two o’clock,’” which is “dramatically different” from mere facts such as “temperature and location data.” *Id.* at 18. PARC contends that Twitter’s combination of Huomo and Cheng “fails to teach or render obvious the ‘facts and assertions’ claim term” because “Twitter appears to allege that Cheng is only relevant to the ‘context graph’ portion of the claim element, and not ‘stor[ing] facts and assertions about a user’s behavior and interests using the event data’ portion.” *Id.* at 19. In particular, PARC argues that Twitter “analogiz[es] Huomo’s teachings to the ‘facts and assertions’ element, while failing to do the same for Cheng.” *Id.* at 19 (citing Pet. 42–46).

Based on the preliminary record, we disagree with PARC’s argument that Twitter fails to adequately identify both “facts and assertions” within Cheng’s user interest model or as suggested by the combined teachings of Huomo and Cheng. As Twitter notes, Cheng’s model is a graph that includes nodes, representing concepts, and edges. Pet. 45–46 (citing Ex. 1005 ¶¶ 38, 40, 42, 45). As Dr. Turnbull elaborates, “[a] node of the personal interest graph 500 represents a concept and an edge connecting two concept nodes represents an ontological relationship between the concepts.” Ex. 1003 ¶ 151 (emphasis omitted); *accord* Ex. 1005 ¶ 45. Thus, Twitter sufficiently shows that Cheng teaches that its context graph includes both facts and ontological assertions relating to a user’s behavior and interests.

(c) Limitation 13[e]

Limitation 13[e] recites, “in response to determining that there exists a registration for notification of changes that matches the modification to the

context graph, sending a notification of context graph change to a recommender.” Ex. 1001, 12:4–7. Twitter relies on either Huomo or the combination of Huomo and Cheng as teaching this limitation. *See* Pet. 56 (citing Pet. 42–55; Ex. 1003 ¶¶ 164–180; Ex. 1004, 7:60–8:11, 9:27–34, 10:3–17, 10:23–50, 11:63–12:8, 12:21–25, 13:18–41, 14:50–15:2, claims 1–2, 7).

Twitter argues that a person of ordinary skill in the art “would have understood that Huomo’s disclosure of ‘context consumers’ is disclosure of ‘a recommender’ as claimed,” and Twitter points to the example of a “supermarket loyalty club” that “can subscribe to receive a notification of changes to the content graph,” such as a trigger indicating that a user’s location is a particular store. Pet. 57 (citing Ex. 1004, 14:50–57). Twitter also contends that a person of ordinary skill in the art “would have understood that Huomo’s teachings, employed in [the Huomo–Cheng] combined system, include sending notification of a change to a recommender.” Pet. 58 (citing Ex. 1003 ¶ 179). Also, according to Twitter, “it would have been obvious, straightforward, and advantageous to implement Huomo’s disclosed connected personal/server computers using . . . Huomo and Cheng’s combined teachings[] of sending a notification of changes to the context graph (blackboard) to a recommender.” *Id.* (citing Ex. 1003 ¶¶ 177–178, 180).

In its Preliminary Response, PARC contends that because Huomo’s blackboard stores context atom changes, which are not facts and assertions in a context graph, any notification of changes in a context atom is not a change in a context graph. *See* Prelim. Resp. 19–20. But PARC does not address Twitter’s arguments for limitation 13[e] based on the combination of

Huomo and Cheng, and, as we discuss above, Cheng's disclosures of facts and assertions in a context graph would also apply to modifications of the context graph for this limitation.

Based on the preliminary record, we find Twitter's showing sufficiently persuasive that a person of ordinary skill in the art would have had reason to implement a system in which a recommender receives notifications of a change in a context graph (according to Cheng's teachings) stored in Huomo's blackboard.

(d) Conclusion as to claim 13

For the above reasons, we determine that Twitter has shown that there is a reasonable likelihood it would prevail in an *inter partes* review with respect to at least claim 13.

4. *Claims 1–5, 7–11, 14–17, 19, and 20*

Claims 14–17 depend from claim 13 and add further limitations. Ex. 1001, 12:8–38. Twitter provides claim charts for these dependent claims, relying on Huomo's teachings and Chang's user interest model for providing the added limitations. *See* Pet. 58–75 (citing Ex. 1003 ¶¶ 181–257, 278–279, 282; Ex. 1004, 3:1–17, 7:3–6, 7:12–48, 7:53–8:4, 8:11–20, 8:46–64, 9:16–34, 9:50–65, 10:3–50, 11:7–9, 11:18–49, 12:9–63, 13:18–22, 13:24–30, 13:61–14:17, 14:50–15:19, 15:42–65, Fig. 3). In addition, for claim 17, Twitter relies on teachings from Lawson to motivate using a RESTful WebAPI to receive real-time event data. Pet. 72–75 (citing Ex. 1003 ¶¶ 265–268, 280, 281, 283–285; Ex. 1006 code (57), ¶¶ 2, 15, 18, 19, 26, 27, 29, 30, 33).

Independent claim 1 is a method claim with limitations that are essentially a subset of the limitations of claim 13. *Compare* Ex. 1001, 10:30–40, *with id.* at 11:47–12:7. Independent claim 7 is directed to “[a] non-transitory computer-readable storage medium” and is likewise essentially a subset of the limitations of claim 13. *Compare id.* at 11:1–13, *with id.* at 11:47–12:7. Twitter contends that “[c]laims 13–17 are the system claim analogs of claims 7–11 and 1–5, respectively.” Pet. 75 (footnote omitted). Thus, Twitter relies on the same evidence and arguments for claims 1–5 and 7–11 as those provided for claim 13–17. Pet. 75–76 (citing Ex. 1003 ¶¶ 85, 286–328, 361–403).

Claim 19 depends from claim 1 and further recites “sending a second notification to the recommender by pushing events into the recommender’s publish/subscribe system asynchronously using a long-pull persistent push connection.” Ex. 1001, 12:47–51. Twitter relies on the arguments for claim 13, and also relies on Chauhan for teaching that such a system may push data asynchronously. *See* Pet. 76–79 (citing Ex. 1003 ¶¶ 329–349; Ex. 1004, 7:60–8:4, 9:27–34, 10:3–17, 10:23–50, 11:63–12:8, 12:21–25, 13:24–30, 14:50–65, 15:42–64; Ex. 1007 ¶¶ 2–5, 12, 13, 15, 274, 284).

Claim 20 depends from claim 1 and further recites “wherein sending the notification comprises notifying the recommender of topological changes in the context graph and/or changes to individual properties of nodes and edges in the context graph.” Ex. 1001, 12:52–55. Twitter relies on its arguments for claim 13, along with additional teachings from Cheng. Pet. 79–82 (citing Ex. 1003 ¶¶ 350–360; Ex. 1005 code (57), ¶¶ 14, 43–50, 52, 53, 54, 55, Figs. 2, 5, 7–10).

PARC does not dispute Twitter’s specific showing for claims 1–5, 7–11, 14–17, 19, and 20, and we find them sufficiently persuasive at this stage, so that Twitter is reasonably likely to prevail on these claims.

D. GROUND S BASED ON HUOMO WITHOUT CHENG (GROUND S 1, 3, 5)

In its first, third, and fifth grounds, Twitter contends that claims 1–4, 7–10, and 13–16 are unpatentable as obvious over Huomo alone, that claims 5, 11, and 17 are unpatentable as obvious over Huomo in view of Lawson, and that claim 19 is unpatentable as obvious over Huomo in view of Chauhan. Pet. 13–14, 25–79. Thus, these grounds omit Cheng as a reference.

In particular, Twitter maps Huomo’s “context atoms” to both the “event data” and the “context graph” of the independent claims. *See* Pet. 41, 43 n.11, 52–53. In its Preliminary Response, PARC contends that Huomo’s “context atoms” cannot be both the recited “event data” and the recited “context graph,” which are two distinct elements. *See* Prelim. Resp. 17–18. We find PARC’s argument to be a cogent one.

PARC also contends that there is a distinction between “facts” and “assertions,” and Twitter has not adequately shown that Huomo, alone, teaches storing assertions in its blackboard. *See id.* at 18; *see also id.* at 19–20 (relying on the same distinction in its arguments for whether Huomo, alone, discloses “sending a notification of context graph change to a recommender”). The merits of this argument are unclear at this stage, because the parties have not proposed constructions for the term “assertions.”

While we find at least some merit to PARC’s arguments regarding Grounds 1, 3, and 5, we do not need to reach a decision on those grounds

because we determine above that Twitter is reasonably likely to prevail on grounds 2, 4, and 6. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (holding that 35 U.S.C. § 318(a) “require[s] a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

IV. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 314(a)

Under 35 U.S.C. § 314(a), the Director has discretion to deny institution of an *inter partes* review. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”). As with other non-dispositive factors considered for institution under § 314(a), the Board weighs factors as part of a “balanced assessment of all relevant circumstances in the case, including the merits.” Patent Trial and Appeal Board Consolidated Trial Practice Guide 58 & n.2 (Nov. 2019), <https://go.usa.gov/xpvPF> (“CTPG”) (discussing follow-on petitions and parallel proceedings).

In *General Plastic Co., Ltd. v. Canon Kabushiki Kaisha*, the Board articulated a non-exhaustive list of factors to be considered in determining whether to exercise discretion under § 314(a) to deny a petition that challenges the same patent as a previous petition. IPR2016-01357, Paper 19 (PTAB Sept. 6, 2017) (precedential), slip op. 9–10. The *General Plastic* factors follow:

1. whether the same petitioner previously filed a petition directed to the same claims of the same patent;

2. whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it;

3. whether at the time of filing of the second petition the petitioner already received the patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition;

4. the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition;

5. whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent;

6. the finite resources of the Board; and

7. the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review.

Id. (footnote omitted).

A. FACTOR 1

PARC contends the first factor weighs in favor of denial because Twitter allegedly coordinated its Petition with Snap, who filed its own petition challenging the '439 patent on May 21, 2021. Prelim. Resp. 10. PARC also contends that "Twitter, Snap, and Facebook . . . coordinated their invalidity contention work and served overlapping invalidity contentions in the parallel district court cases." *Id.* (citing the related district court proceedings); *see supra* part II.A (identifying these proceedings).

As Patent Owner recognizes, the first factor examines whether the same petitioner or a related petitioner previously filed a petition directed to the same claims of the same patent, and can also apply in some circumstances when "when different petitioners submit multiple petitions to challenge the same patent." Prelim. Resp. 8 (citing *Valve Corp. v. Electronic*

Scripting Products, Inc., IPR2019-00062, Paper 11 (PTAB Apr. 2, 2019) (precedential) (“*Valve I*”); *see also Valve Corp. v. Electronic Scripting Products, Inc.*, IPR2019-00064, Paper 10 (PTAB May 1, 2019) (precedential) (“*Valve II*”). *Valve II* held that “when different petitioners challenge the same patent, [the Board] consider[s] any relationship between those petitioners while weighing the *General Plastic* factors.” *Valve II* at 10. In weighing this factor against the second petitioner Valve in *Valve II*, the Board noted that “Valve and HTC were co-defendants in the District Court litigation and were accused of infringing the [challenged] patent based on the same product, namely HTC’s VIVE devices that incorporate technology licensed from Valve.” *See id.* at 11. Also, Valve joined the previous petition as a party and the later-filed Valve petitions challenged the same claims as the previous petition. *See id.* at 11 (noting a “complete overlap in the challenged claims”).

As Twitter persuasively argues, similar considerations do not exist here. *See* Pet. 83–84. Twitter did not previously file a petition challenging the ’439 patent, nor did Twitter seek to join the earlier Snap petition. *See generally* IPR2021-00986. Also, Twitter states that it “was sued separately from, and is not a codefendant with, Snap (the prior petitioner); nor is there any overlap between Twitter’s accused products and Snap’s.” Pet. 83 (citing Ex. 1018 ¶¶ 65–79; Ex. 1019 ¶¶ 66–80). Twitter states that it and Snap are “unrelated companies; if anything, they are direct competitors.” Pet. 84.

There is also no evidence that Snap and Twitter coordinated the preparation of their respective petitions: Twitter represents that it “has not coordinated its IPR with Snap; and the attorneys substantively preparing Twitter’s IPR did not use Snap’s petition as a roadmap *or even consult it*.

Indeed, . . . no attorney substantively involved in preparing Twitter’s petition reviewed Snap’s IPR.” Pet. 84. We also note that the Petition does not cite any of the references cited in the earlier Snap petition. *See* IPR2021-00986, Paper 1 (Snap petition).

Therefore, this factor favors not exercising discretionary denial.

B. FACTORS 2, 4, AND 5

PARC contends that “Snap and Twitter knew, or should have known, about the prior art the other asserts in their respective petitions because of the art’s alleged public availability and Twitter’s, Snap’s, and Facebook’s joint invalidity work by at least the May 7, 2021, Joint Scheduling Conference filing in district court.” Prelim. Resp. 10 (citing Ex. 2006). According to PARC, on June 15, 2021, the three companies “each served identical invalidity charts for a number of prior art references, including the Cheng reference asserted here.” *Id.* at 11 (citing Exs. 2007–2009). PARC argues that “[t]hese charts even have the same label (‘B33’).” *Id.*

Some Board decisions—including *General Plastic*—indicate that a petitioner bears some responsibility to provide a reasonable explanation about when it learned of the references in its petition. *See General Plastic*, Paper 9 at 10 (“Petitioner provided no meaningful explanation for the delay in filing the follow-on petitions.”). *General Plastic* also reasons that “[c]onsidering other factors (i.e., factors 2, 4, and 5) allows us to assess and weigh whether a petitioner should have or could have raised the new challenges earlier.” *General Plastic* at 18.

But in this case, Factor 2 of *General Plastic*, “whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the

second petition or should have known of it,” is of little probative value. Twitter did not file a first petition and there is no evidence of a significant relationship between Twitter and prior petitioner Snap. Hence, the issue of whether Twitter could have raised the prior art at issue here in the first petition is not relevant. *General Plastic* at 19–20.

Factors 4 and 5 involve the length of time between when Twitter learned of Huomo, Cheng, Lawson, and Chauhan and when it filed the Petition, and whether Twitter has adequately explained this time period between the two petitions.

Again, unlike Twitter’s Petition, Snap’s petition does not rely on Huomo, Cheng, Lawson, or Chauhan. *See* IPR2021-00986, Paper 1. Therefore, as to factor 5, even assuming Twitter knew of Snap’s prior art and challenged claims, that is not an indication that Twitter had knowledge of this Petition’s prior art combinations at the earlier time.

Further to factor 4, Twitter states that it “filed its Petition roughly two months after serving PARC with its preliminary invalidity contentions on June 15, 2021 (and roughly three months after receiving PARC’s May 11, 2021 preliminary infringement contentions, which, for the first time, identified certain dependent claims PARC was asserting in the case).” Pet. 86. Twitter also argues that it filed its Petition “before receiving PARC’s final infringement contentions and narrowed election of claims.” *Id.* (citing Ex. 1022, 3–4). Assuming that Twitter became aware of Huomo, Cheng, Lawson, and Chauhan around the time it filed its initial invalidity contentions, the time gap between that awareness and the filing of its Petition does not reflect an unreasonable delay in view of time typically required for preparing a petition.

Accordingly, these factors favor not exercising discretionary denial.

C. FACTOR 3

As Twitter notes, the filing date of this Petition precedes both PARC's preliminary response to Snap's petition and the institution decision in IPR2021-00986. Pet. 85. PARC does not address the third factor. *See* Prelim. Resp. 10–13.

Accordingly, this factor favors not exercising discretionary denial.

D. FACTORS 6 AND 7

Regarding factor 6, PARC contends that, given that Twitter, Snap, and Facebook each “have filed petitions for the ’439 Patent, those petitions were filed months apart, and they allege a total of 14 different grounds with 14 different alleged prior art references, the Board’s resources will inevitably be stretched thin.” Prelim. Resp. 12. For factor 7, PARC contends that Twitter “provides no explanation for its failure to file its Petition closer in time to Snap’s, or why it did not merely join Snap’s already-instituted Petition. Nor does [Twitter] explain why it was unable to coordinate with Snap here just as it has in the District Court.” *Id.* at 13.

Twitter contends factors 6 and 7 are “neutral” because “[t]hese factors consider the Board’s finite resources and requirement to issue a final determination within a year of institution.” Pet. 87. According to Twitter, these proceedings challenging the ’439 patent are independent, yet they “will create efficiencies for the Board in terms of understanding the background in the art and the ’439 itself.” *Id.* “Further,” Twitter argues, “there is no risk that the Board could not issue a final determination within a year of institution” of Twitter’s Petition. *Id.*

Given the differences between this Petition and the Snap petition, joinder is not possible under current precedent. *See Facebook, Inc. v. Windy City Innovations, LLC*, 973 F.3d 1321, 1336 (Fed. Cir. 2020) (“We therefore conclude that the unambiguous meaning of § 315(c) is that it allows the Director discretion to join a person *as a party* to an already-instituted IPR but does not permit the joined party, by virtue of the joinder decision alone, to bring new issues from a second proceeding into the existing proceeding.”). Also, we agree with Twitter that any similarities in the prior art teachings as applied to the challenged claims will provide some basis for efficiency in timely resolving the issues of this review.

Accordingly, these factors are neutral or favor not exercising discretionary denial.

E. CONCLUSION ON DISCRETIONARY DENIAL

Under a holistic analysis and under the particular circumstances of this case, the interests of efficiency and integrity of the patent system tilt toward not exercising discretionary denial of the Petition under § 314(a).¹⁰

V. CONCLUSION

Based on the evidence available on the preliminary record, Twitter has demonstrated a reasonable likelihood of success in showing that at least one of the challenged claims of the ’439 patent is unpatentable on at least one of the grounds raised in the Petition. Thus, as directed by *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018), we institute an *inter partes* review on all

¹⁰ Given our decision, we do not need to weigh other factors that Petitioner raises in the Petition. *See* Pet. 88 (factors 8 and 9).

grounds raised in the Petition. And under the circumstances, we decline to exercise our discretion to deny institution under § 314(a).

VI. ORDER

In consideration of the foregoing, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–5, 7–11, 13–17, 19, and 20 of the '439 patent is instituted with respect to all the grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review of the '439 patent commences on the entry date of this Order, and notice is hereby given of the institution of a trial.

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Patent 9,208,439 B2

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