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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LI-JU CHEN, YING C. GUO, XIN S. MAO,
BO YANG, and HUA ZHANG

Appeal 2019-001283
Application 14/294,908
Technology Center 2100

Before CAROLYN D. THOMAS, JASON V. MORGAN, and
JOHN F. HORVATH, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* MORGAN.

Opinion Concurring-in-part, Dissenting-in-part filed by *Administrative Patent Judge* THOMAS.

MORGAN, Administrative Patent Judge.

DECISION ON APPEAL

STATEMENT OF THE CASE

Introduction

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Summary Of The Disclosure

Appellant's claimed subject matter relates to "managing a complex object in a cloud environment." Abstract.

The Specification discloses example complex objects as objects that include attributes (e.g., Name, Birth, Image, Price, ROI), methods (e.g., UploadImage, AddFollow, ROIChange), and constraints (e.g., Searchable [Name], Followable). Spec. ¶ 69, Fig. 5. These complex objects are part of a System of Engagement, such as a MicroBlogger system, in which objects are declared, managed, and consumed. *Id.* ¶¶ 2–3. In admitted "prior art, [such] objects are usually defined by programmers." *Id.* ¶ 5. The Specification discloses that an "object model of [a] complex object may be established using [a] declarative language," such as "an object oriented language with annotations." *Id.* ¶¶ 58, 70.

The Specification discloses one way to analyze an object model is to extract from the object model metadata describing its structure. *Id.* ¶ 73. This enables mapping of an attribute of the object model to corresponding data storage. *Id.* ¶ 74. For example, an attribute that is structural data can be

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as International Business Machines Corporation of Armonk, New York. Appeal Br. 2.

mapped to a relational database. *Id.* ¶ 76. Semi-structural data can be mapped to a non-relational database. *Id.* ¶ 77. Non-structural data can be mapped to an object storage system. Spatial data can be mapped to a spatial database. *Id.* ¶ 78. And text data can be mapped to an index database. *Id.* ¶ 79. Such mappings (i.e., desired data storage) can be used to select available data storage in a cloud environment (i.e., the data storage can be generated). *Id.* ¶ 83.

The Specification also discloses determining an object service interface as a data service of the complex object. *Id.* ¶ 81. For example, "in response to the information which describes [an] attribute of the complex object . . . interface[s] for adding, deleting, modifying and querying the attribute [are] determined." *Id.* Similarly, "in response to the information which describes [a] constraint of the complex object . . . interface[s] for adding, obtaining and deleting the constraint" are determined. *Id.* For example, "for the constraint of 'comment-able', . . . interface function[s] such as addComment(), getComments(), [and] deleteComment() may be determined." *Id.* Thus, "[t]he generated data storage may be accessed via the created object service interfaces to perform operations on the stored data." *Id.* ¶ 86.

Representative Claims (Key Limitations Emphasized)

1. A method for managing a complex object in a cloud environment, the method comprising:

obtaining, by one or more processors, *an object model of the complex object, the object model comprising information describing a constraint, attributes, and a method of the complex object, wherein the complex object describes an entity in a System of Engagement*, wherein the complex object is continuously evolving with growing data and a varying

structure, and *wherein the System of Engagement uses a System of Engagement application to retrieve and provide data to a particular user according to the constraint, the attributes, and the method of the complex object*;

analyzing, by one or more processors, *the object model to determine* at least one desired data storage mapped with the object model and *at least one desired data service representing an object service interface for accessing the complex object*; and

generating, by one or more processors, at least one data storage and *at least one data service for the complex object in the cloud environment, based on the desired* at least one data storage and a*t least one data service*.

2. The method according to claim 1, wherein the constraint comprises:

being search-able of the attribute, *wherein a search-able constraint indicates that the complex object may be searched,*

being follow-able of the complex object, *wherein a follow-able constraint indicates that the complex object has a relationship with other objects that follow the complex object*,

being tag-able of the complex object, *wherein a tag-able constraint indicates that the complex object has a tag by which the complex object may be searched*,

being comment-able of the complex object, *wherein a comment-able constraint indicates that the complex object includes a comment about traits of the complex object*, and

being locatable of the complex object, wherein a locatable constraint indicates that the complex object may be located.

3. The method according to claim 1, *wherein the object model further comprises information describing* at least one of *a relationship* and a conditions-action *of the complex object*.

4. The method according to claim 1, wherein the analyzing of the object model to determine at least one desired data storage

mapped with the object model and at least one desired data service representing an object service interface for accessing the complex object comprises:

extracting, by one or more processors, metadata from the object model;

establishing, by one or more processors, a mapping from the attributes to the corresponding data storage based on the extracted metadata; and

determining, by one or more processors, at least one object service interface for accessing the complex object based on the information.

5. The method according to claim 4, wherein the *establishing of a mapping from the* attribute *attributes to the corresponding data storage based on the extracted metadata comprises*:

determining, by one or more processors, *that the attributes are* structural data, semi-structural data, non-structural data, spatial data and *text data to be retrieved based on the extracted metadata*;

mapping, by one or more processors, the structural data to a relational database in response to determining that the attributes are the structural data, wherein the relational database becomes one of data storages for the complex object;

mapping, by one or more processors, the semi-structural data to a non-relational database in response to determining that the attributes are the semi-structural data, wherein the non-relational database becomes one of the data storages for the complex object;

mapping, by one or more processors, the non-structural data to an object storage system in response to determining that the attributes are the non-structural data, wherein the object storage system becomes one of the data storages for the complex object;

mapping, by one or more processors, the spatial data to a spatial database in response to determining that the attributes are the

spatial data, wherein the spatial database becomes one of the data storages for the complex object; and

mapping, by one or more processors, *the text data to be retrieved to an index database system in response to determining that the attributes are the text data to be retrieved*, wherein the index database system becomes one of the data storages for the complex object.

6. The method according to claim 4, wherein the determining of at least one object service interface based on the information comprises:

determining, by one or more processors and *in response to the information describing the attributes of the complex object, a first interface for adding, deleting, modifying and querying the attributes*;

determining, by one or more processors and *in response to the information describing the method of the complex object, a second interface for exposing a public method*; and

determining, by one or more processors and in response to the information describing the constraint of the complex object, a third interface for adding, obtaining and deleting the constraint.

16. The system according to claim 15, further comprising:

program instructions to determine that the attribute is any one of structural data, semi-structural data, non-structural data, spatial data and text data to be retrieved based on the extracted metadata;

program instructions to map the attribute to a relational database in response to determining that the attribute is the structural data, to map the attribute to a non-relational database in response to determining that the attribute is the semi-structural data, to map the attribute to an object storage system in response to determining that the attribute is the nonstructural data, to map the attribute to a spatial database in response to determining that the attribute is the spatial data, and to map the attribute to an index database system in response to determining that the attribute is the text data to be retrieved.

The Examiner's Rejections And Cited References

The Examiner rejects claims 1–10 and 12–20 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 2–9.

The Examiner rejects claims 1–4, 7–15, 18, and 20 under 35 U.S.C. § 103 as being unpatentable over Ng et al. (US 6,374,256 B1; issued Apr. 16, 2002) ("Ng"), Mazhar et al. (US 2010/0088150 A1; published Apr. 8, 2010) ("Mazhar"), Kawai (US 5,717,924; issued Feb. 10, 1998), and Wong et al. (US 6,708,172 B1; issued Mar. 16, 2004) ("Wong"). Final Act. 9–17.

The Examiner rejects claims 5 and 19 under 35 U.S.C. § 103 as being unpatentable over Ng, Mazhar, Kawai, Wong, Crockett et al. (US 2013/0205028 A1; published Apr. 8, 2013) ("Crockett"), and Vlahos et al. (US 2002/0133504 A1; published Sept. 19, 2002) ("Vlahos"). Final Act. 20–25.

The Examiner rejects claims 6 and 17 under 35 U.S.C. § 103 as being unpatentable over Ng, Mazhar, Kawai, Wong, and Gorelik (US 2012/0215766 A1; published Aug. 23, 2012). Final Act. 19–20.

The Examiner rejects claim 16 under 35 U.S.C. § 103 as being unpatentable over Ng, Mazhar, Kawai, Wong, and Shiffer et al. (US 2009/0198670[2] A1; published Aug. 6, 2009) ("Shiffer"). Final Act. 17–19.

[2] The Examiner erroneously cites to Wei et al. (US 2012/0110024 A1; published May 3, 2012) instead of Shiffer in rejecting claim 16. Final Act. 17. This is a typographical error and Appellant had the correct information for Shiffer. *See* Appeal Br. 56; Notice of Refs. Cited by Examiner 1 (Dec. 27, 2016). Therefore, we hold this error harmless.

ANALYSIS (35 U.S.C. § 101)

Principles Of Law

To constitute patent-eligible subject matter, an invention must be a "new and useful process, machine, manufacture, or composition of matter, or [a] new and useful improvement thereof." 35 U.S.C. § 101. There are implicit exceptions to the categories of patentable subject matter identified in 35 U.S.C. § 101, including: (1) laws of nature; (2) natural phenomena; and (3) abstract ideas. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). The U.S. Supreme Court has set forth a framework for distinguishing patents with claims directed to these implicit exceptions "from those that claim patent-eligible applications of those concepts." *Id.* at 217 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012)). The evaluation follows a two-part framework: (1) determine whether the claim is *directed to* a patent-ineligible concept, e.g., an abstract idea; and (2) if so, then determine whether any element, or combination of elements, in the claim is sufficient to ensure that the claim amounts to *significantly more* than the patent-ineligible concept itself. *See id.* at 217–18.

The U.S. Patent and Trademark Office ("USPTO") published guidance on the application of the two-part analysis in 2019. USPTO, 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (January 7, 2019) ("2019 Revised Guidance"); *see also* USPTO, October 2019 Update: Subject Matter Eligibility, available at https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf (Oct. 17, 2019) ("Oct. 2019 Update"). Under that guidance, we first look to whether the claim recites:

(1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes) (*see* 2019 Revised Guidance, 84 Fed. Reg. at 54 (step 2A, prong one)); and

(2) additional elements that integrate the judicial exception into a practical application (*see id.* at 54–55 (step 2A, prong two); MPEP §§ 2106.05(a)–(c), (e)–(h)).

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See 2019 Revised Guidance, 84 Fed. Reg. at 56.

Step 2A, Prong One

The Examiner determines that the steps of claim 1 "describe the concept of collecting, displaying, and manipulating data, which corresponds to concepts identified as abstract ideas by the courts." Final Act. 3 (citing *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332 (Fed. Cir. 2017)); *see also* Ans. 3–4.

Specifically, claim 1 recites "obtaining . . . an object model of [a] complex object," "analyzing . . . the object model to determine at

least one desired data storage mapped with the object model and at least one desired data service representing an object service interface for accessing the complex object," and "generating . . . at least one data storage and at least one data service for the complex object . . . based on the desired at least one data storage and at least one data service."

In light of the Specification, discussed above, these steps encompass obtaining an object model established using a declarative language, mapping an attribute of the object model to corresponding data storage and selecting available data storage, and determining an interface for adding, deleting, modifying, or querying an attribute of the object. *See, e.g.*, Spec. ¶¶ 70, 73, 74, 76–78, 81, 83. Thus, the steps encompass further defining a complex object—which has been partially defined using an object model—by determining where data for the complex object is stored and how to access data of the complex object.

Defining complex objects has usually been a programmer task. *See id.* ¶ 5. As the Specification demonstrates, determining where to store the data is a rote definition task driven by the type of data (e.g., structural, semi-structural, non-structural, spatial, text) and the availability of storage. *See id.* ¶¶ 76–79, 83. Determining how to access the data is similarly a rote definition task driven by what data a complex object contains. *See id.* ¶ 81.

These determinations show that the claimed steps are similar to patent-ineligible mental processes for "translating a functional description of a logical circuit into a hardware component description

of the logic circuit." *See Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1150 (Fed. Cir. 2016). The claimed steps are also similar to patent-ineligible XML document manipulation claims that, even with data structure limitations that "add a degree of particularity," nonetheless encompass mental processes (i.e., an "abstract idea of itself") of "organizing, displaying, and manipulating data of particular documents." *Intellectual Ventures I*, 850 F.3d at 1341. Both types of patent-ineligible claims relate to the translation of information (e.g., a functional description of a logical circuit or web site navigation data or modifications of data detected via a user interface) to another form (e.g., a hardware component description of a logical circuit or a data component of an XML document) using processes a human could perform. *See Synopsys*, 839 F.3d at 1150 (the claimed "translation is a mental process"); *Intellectual Ventures I*, 850 F.3d at 1339 (noting that resolving conflicts between incompatible XML documents "was a difficult task that required specialized programming skills to manipulate and transfer XML documents into the desired format").

Accordingly, we determine that claim 1 recites concepts performed in the human mind—including observation, evaluation, judgement, opinion—and, therefore, claim 1 recites an abstract idea in the form of mental processes. *See* 2019 Revised Guide, 84 Fed. Reg. at 52.

Step 2A, Prong Two

Appellant contends the Examiner erred in rejecting claim 1 because it does "not recite any 'collecting' of data or 'displaying' of

data," but instead recites a technique "to facilitate generation of both a 'data storage' as well as a 'data service' for a complex object in a cloud environment by use of an object model of the complex object that describes a constraint, attributes and a method of the complex object." Appeal Br. 9. Appellant argues this technique provides a technological improvement to cloud based computing "by *automatically generat*[*ing*] both a (1) data storage and (2) a data service based on a desired data storage that is mapped with the object model and a desired data service that represents an object service interface for accessing the complex object." *Id.* at 10. Appellant submits this streamlines "the provisioning of various complex objects and avoid[s] complex programming techniques that would otherwise be required to provide different customized environments." *Id.* (citing Spec. ¶ 5)

Appellant's arguments are not persuasive because the claimed generation of a data storage and a data service does not improve the functioning of a computer or other technology or technical field. *See* 2019 Revised Guidance, 84 Fed. Reg. at 55. Rather, the claimed generation of a data storage and a data service automates prior art programming tasks such as data storage provisioning and providing simple interfaces. *See* Spec. ¶¶ 5–6. Merely automating manual processes is not enough to integrate an abstract idea into a patent-eligible practical application. *See, e.g.*, *Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1055 (Fed. Cir. 2017) ("mere automation of manual processes using generic computers does not constitute a patentable improvement in computer technology").

Moreover, the claimed invention does not improve computer capabilities. *Compare with Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016) (claims "directed to a specific improvement to the way computers operate, embodied in the self-referential table" were not abstract).

Appellant argues that the claim 1 step of "'generating' is very different from 'manipulating' since generating provides tangible new things (data storage and data service), whereas manipulating something merely processes pre-existing information." Reply Br. 3. But Appellant does not show what "tangible new things" are generated by selecting available data storage or determining an interface for adding, deleting, modifying, or querying an attribute of the object. The claimed invention is unlike, for example, a method that automatically opens a press at a proper time to cure rubber, thus leading to something tangible (i.e., the cured rubber). *See Diamond v. Diehr*, 450 U.S. 175, 187 (1981). Rather, the claimed invention is more like the use of an algorithm to update an alarm value. *See Parker v. Flook*, 437 U.S. 584, 585 (1978). Even if the new information generated may be useful if further applied (*id.* at 586), merely generating such information does not create "tangible new things" such that the claimed process does not recite an abstract idea (*id.* at 594–95).

Appellant also argues the claimed technique "allows for automatically updating a data storage and a data service when the object model of the complex object changes – *without having to modify the program of the System of Engagement application*." Reply

Br. 4 (citing Spec. ¶¶ 5, 94). Appellant unpersuasively relies on limitations not found in claim 1 (i.e., the claim fails to limit the steps to be performed *when the object model changes* or to preclude *modification of the program of System of Engagement application*). Moreover, and more importantly, the *analyzing* and *generating* recitations are highly general and fail to include limited rules structured to reflect a specific technique different from that which would likely be used by a programmer performing the steps manually. *See McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1316 (Fed. Cir. 2016).

For these reasons, we determine claim 1 does not have additional recitations that integrate the underlying mental processes—concepts performed in the human mind including observation, evaluation, judgement, opinion)—into a patent-eligible practical application. Therefore, claim 1 is directed to an abstract idea.

Step 2B

Appellant argues that even if claim 1 is directed to an abstract idea, the method, viewed as an ordered combination, contains additional recitations that contain an inventive concept that makes claim 1 significantly more than the underlying abstract idea. Appeal Br. 15. Specifically, Appellant argues that

> when viewing Claim 1 as an ordered combination, the following inventive features are provided, including a synergistic interplay between: (1) obtaining an object model of a complex object, (2) analyzing the object model to determine a desired data storage mapped with the object model and a desired data service representing an object service interface for accessing the complex object, and (3) automatically generating

> a data storage and a data service for the complex object based on the desired data storage and data service. This automatic generation of both (1) a data storage and (2) a data service based on an object model of a complex object advantageously allows an application to retrieve and provide data to a particular user according to the constraint, attributes and the method of the complex object – thereby advantageously streamlining the provisioning of various complex objects and avoiding complex programming techniques that would otherwise be required to provide different customized environments (i.e. a providing a specific technological improvement, and not a mere generic computer process that manipulates and displays data).

Id.; *see also* Reply Br. 6–8.

Appellant's arguments are unpersuasive because they are directed to the underlying abstract idea, discussed above in Steps 2A, Prongs One and Two. Thus, Appellant's arguments fail to show that there are *additional* recitations that provide the requisite inventive concept by adding a specific limitation or combination of limitations that was not well-understood, routine, or conventional in the art. 2019 Revised Guidance, 84 Fed. Reg. at 56.

Furthermore, claim 1 recites, for example, a System of Engagement, processors, data storage, and a cloud environment. But the Specification's descriptions of these elements shows that they were well-understood, routine, and conventional at the time of the invention. *See, e.g.*, Spec. ¶ 2 (describing Systems of Engagement "such as a MicroBlogger system"), ¶ 41 (noting "[e]xamples of well-known computing systems, environments, [and] configurations . . . suitable for use"), ¶¶ 76–80 (describing data storage technologies such as a relational database, a non-relational database, an object storage system, a spatial database, and an index database system), ¶ 85 (noting

that "generation of storage structures of various types of data storages in [a] cloud environment is well known"). Even when considered in combination, we are unable to discern anything in the additional recitations of claim 1 (i.e., in the recitations that are not part of the underlying abstract idea) that were not well-understood, routine, and conventional.

Preemption

Appellant further argues that claim 1 does not recite "language that would 'tie up the use of basic tools of scientific and technological work and thereby inhibit future innovation premised upon them.'" Appeal Br. 18 (quoting Westlaw Headnote No. 2 (Key No. 291k451) to *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)). In particular, Appellant argues "it is immediately clear that the claim does not seek to tie-up all ways of 'obtaining an object model, analyz[ing] the object model to determine [a] data storage and service, and generat[ing] the data storage and service.'" *Id.* at 19; *see also* Reply Br. 9–10.

Appellant's arguments are unpersuasive because "[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility," as "questions on preemption are inherent in and resolved by the § 101 analysis." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (internal quotation marks and citation omitted). No additional determination regarding preemption is necessary here because the two-part analysis (i.e., steps 2A (prongs one and two) and

2B, discussed above) shows that claim 1 is directed to patent-ineligible subject matter.

Accordingly, we sustain the Examiner's 35 U.S.C. § 101 rejection of claim 1, and claims 2, 3, 12–14, 18, and 20, which Appellant does not argue separately with respect to this rejection.

Dependent Claims 4–10, 15–17, And 19

Appellant contends dependent claims 4–10, 15–17, and 19 are not directed to patent-ineligible subject matter.[3] Appeal Br. 22–28, 30–31; *see also* Reply Br. 11–17. We have reviewed Appellant's contentions and determined that they do not persuasively distinguish the subject matter of these claims from the patent-ineligible subject matter of claim 1.

For example, Appellant contends the features of claim 1

> do not come anywhere close tying up the science or technology of "obtaining an object model, analyze the object model to determine data storage and service, and generate the data storage and service" (the alleged abstract idea) due to the recitation of a specific implementation of how the object model analyzing step is actually performed.

Appeal Br. 21. In particular, Appellant contends that

> [t]he features recited in Claim 4 advantageously facilitate an improved process for determining an 'object service interface' that is used for accessing the 'complex object' by the use of a mapping technique that establishes mappings from the complex object's attributes to the corresponding data storage – thus providing an efficient technique for determining an

[3] Appellant also contends dependent claim 11 is not-directed to patent-ineligible subject matter. Appeal Br. 29–30. The Examiner has not rejected claim 11 under 35 U.S.C. § 101 (Ans. 21; Final Act. 5), however, as Appellant acknowledges (Reply Br. 17).

> interface to be used for adding, deleting, modifying and querying an attribute of the 'complex object.'

Id. at 22. Appellant also argues

> [t]he features . . . in Claim 4 advantageously facilitate an improved process for determining an 'object service interface' that is used for accessing the 'complex object' by the use of a mapping technique that establishes mappings from the complex object's attributes to the corresponding data storage – and thus provide significantly more than "obtaining an object model, analyze the object model to determine data storage and service, and generate the data storage and service" (the alleged abstract idea) using a generic computer process.

Id. Appellant raises similar contentions with respect to claims 5–10, 15–17, and 19. *See id.* at 23–28, 30–31.

Appellant's contentions draw our attention to limitations in the dependent claims (e.g., to the claim recitation of "determining, by one or more processors, at least *one object service interface* for accessing the *complex object* based on the information" (emphases added)). But merely pointing out what a claim recites is not considered an argument for separate patentability of the claim. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2018).

Furthermore, Appellant's contentions in the Reply Brief regarding the other dependent claims do not add any timely persuasive arguments. *See* Reply Br. 11–17. "Any argument raised in the reply brief which was not raised in the appeal brief, or is not responsive to an argument raised in the examiner's answer . . . will not be considered by the Board . . . unless good cause is shown." 37 C.F.R. § 41.41(b)(2).

The arguments Appellant makes in the Reply Brief that do address new findings and analysis in the Answer are not persuasive of error. For example, Appellant argues the Examiner "erroneously asserts that the features of Claim 4 are described in Appellant[']s paragraph [0005] of the Published Application." Reply Br. 12; *see also* Ans. 16. But Appellant does not show, and we are unable to ascertain, how this alleged deficiency in the Answer demonstrates error in the Examiner's determination that the recitations of claim 4 add "no meaningful limitation beyond that of the abstract idea" of claim 1, from which claim 4 depends. Final Act. 6.

Appellant's Reply Brief arguments with respect to the Examiner's 35 U.S.C. § 101 rejection of claims 5–10, 15–17, and 19 are similarly untimely or unpersuasive. *See* Reply Br. 13–17. Accordingly, we sustain the Examiner's 35 U.S.C. § 101 rejection of claims 4–10, 15–17, and 19.

ANALYSIS (35 U.S.C. § 103)

Claims 1, 4, 7–12, 15, 18, and 20

The Examiner finds that Ng's method of mapping object classes in an object-oriented application to database table entries, where the object classes have "fields, methods, and other operators associated with an object-oriented language" (Ng 7:51–53) teaches or suggests "obtaining . . . an object model of [a] complex object," as recited in claim 1. *See* Final Act. 9 (citing Ng 7:49–63, 8:65–9:67).

Appellant argues that "Ng's 'class' is not equivalent to the claimed 'object model' because such 'class' is not described as being

a 'model' *of* a 'complex *object*.'" Appeal Br. 37. Appellant argues Ng's class "is described as being *in* an 'object-oriented application'" and that "'objects' are created *from* the 'classes.'" *Id.* at 37, 43 (citing Evidence Appendix[4]); Reply Br. 19 ("the Examiner is interchanging . . . the Ng 'class' and the Ng 'object'"), 22–26.

Appellant's arguments are unpersuasive because the Specification explicitly discloses that a "complex object may be described using a declarative programming language." Spec. ¶ 58 (cited in Ans. 30); *see also id.* ¶ 70. That is, such descriptions form *models* of complex objects, and the *models* are not themselves complex objects. Appellant's arguments fail to distinguish the claimed object model of a complex object from Ng's classes. In particular, in Ng "classes have fields, methods, and other operators associated," where "[f]ields . . . are used to store different types of data or variables and methods are used to manipulate the *objects derived from the corresponding classes*." Ng 7:51–56 (emphasis added) (cited in Ans. 31). That is, objects in Ng are created *from* Ng's classes; thus Ng's classes are object models that *describe* the complex objects created therefrom. Therefore, use of classes in Ng teaches or suggests

[4] The cited Evidence Appendix (Appeal Br. 77–78) is an excerpt from Michelle Yaiser, *Object-oriented programming concepts: Objects and classes*, Adobe, archive available at https://web.archive.org/web/20111116022157/https://www.adobe.com/devnet/actionscript/learning/oop-concepts/objects-and-classes.html (Oct. 31, 2011). This evidence was presented to (Resp. to Final Office Act. (filed June 18, 2018)) and considered by the Examiner (initialed Resp. to Final Office Action (July 2, 2018) ("OK TO ENTER: /M.S.S/")). Thus, this evidence is properly before us and has been considered.

"obtaining . . . an object model of [a] complex object," as recited in claim 1. *See* Final Act. 9.

The Examiner finds that Ng's "object model or class . . . includes information about a constraint, method, and attributes." Final Act. 9 (citing Ng 7:49–63, 8:65–9:67). Specifically, the Examiner relies on Ng's teaching that classes have fields (i.e., attributes), methods, and other operators. *See* Ng 7:51–53 (cited in Final Act. 9); Ans. 27–28. The Examiner finds that Wong's ability to "make certain information for private view only" (Wong 25:46–47) teaches or suggests constraints as a type of other operator (*see* Ans. 29).

Appellant argues Wong does not mention "a 'complex object', and therefore . . . does not describe retrieving data 'according to the constraint, the attribute, and the method ***of*** *the* <u>*complex object*</u>.'" Appeal Br. 36. Appellant also argues that Ng's objects are not *complex* objects because in Ng "'fields' are used to *store* data, and 'methods' are used to *manipulate* class-derived objects – without regards to any 'constraint' of a 'complex object.'" *Id.* at 36, 41–42 (citing, e.g., dictionary.com (a constraint can be a "limitation or restriction"); Spec. ¶ 56); Reply Br. 3, 25–27.

Appellant unpersuasively attacks Ng and Wong individually even though the Examiner's rejection is based on their combined teachings and suggestions. *See* Final Act. 9; Ans. 29; *In re Keller*, 642 F.2d 413, 426 (CCPA 1981). In particular, Appellant does not dispute that Wong teaches or suggests a constraint, but instead argues Wong merely teaches that "a 'user profile' has a constraint, and the 'user profile' is not equivalent to the claimed 'complex object' since the

'user profile' does not comprise 'information describing a constraint, an attribute, and a method.'" Reply Br. 20–21. But the Examiner relies on Ng, not Wong, to teach or suggest a complex object. *See* Final Act. 9. Even if the class fields, methods, and other operators of Ng fall short of teaching or suggesting an object model comprising information describing *constraints* of a complex object, as Appellant argues (Appeal Br. 36), we agree with the Examiner that Wong's teaching of limiting access to information (i.e., making the information private) teaches or suggests adding *constraints* to Ng's classes, thereby adding constraints to the objects that are defined by those classes (*see* Ans. 29). Therefore, we agree with the Examiner that the combination of Ng and Wong teaches or suggests "the object model comprising information describing a constraint, attributes, and a method of the complex object," as recited in claim 1. *See* Final Act. 9; Ans. 29.

The minority disagrees that the Appellant is attacking the references individually, finding the Specification and claim 1 define a complex object as an entity in a System of Engagement, and neither Ng or Wong teach such an object. Respectfully, we disagree. The Specification identifies MicroBlogger and Mobile Banking as types of Systems of Engagement applications, without ever defining a "System of Engagement application." Spec. ¶ 2. We understand a "System of Engagement application" to be an application that allows users to interact with one another. The Specification indicates that in such applications, the users and comments they make can be represented by objects, i.e., that the applications are object-oriented. *Id.* Moreover,

these objects can be "complex objects" because they can contain data having different formats (e.g., structured, unstructured, plain text) whose size "is exploding." *Id*. Respectfully, none of these disclosures "define" a complex object in a System of Engagement application. They simply describe an ordinary object in an object-oriented application that, due to the social nature of the application, can contain an ever expanding amount of different types of data (e.g., a growing list of comments containing text, embedded graphics, links to videos, documents, webpages, or other user profiles).

Ng describes object classes (object models) in an object oriented application and "objects derived from the corresponding classes." Ng 7:47–56 (cited in Final Act. 9). Wong teaches a "System of Engagement application," namely, a "Spatial Chat Engine" that allows users to move around a two-dimensional space and "chat with only whomever is in the vicinity of the user." Wong 21:10–13 (cited in Final Act 12). We agree with the Examiner that it would have been obvious to modify Ng's object classes defining Ng's objects based on the teachings of Wong "to allow the system to be able to make a particular class to represent an object/entity in a system of engagement application," e.g., to use Ng's object classes to define the user objects in Wong's Spatial Chat application. *See* Final Act. 12. Indeed, although the Examiner does not rely on Wong for teaching an object oriented application containing objects, it does. *See* Wong 28:51–54 (teaching the "users" in the application can be represented by "graphical objects"). Similarly, although the Examiner doesn't rely on Ng for teaching a "System of Engagement application," it arguably

does. *See* Ng 9:30–35. Fig. 8 (teaching a purchasing application associating customer objects with order objects, and vice-versa).

The Examiner further relies on Wong's system for enabling users to send and receive messages (Wong 21:12–55), and to edit their profiles and view the profiles of others (*id.* at 25:42–60), to teach or suggest "wherein the complex object describes an entity in a System of Engagement," and further "wherein the System of Engagement uses a System of Engagement application to retrieve and provide data to a particular user according to the constraint, the attributes, and the method of the complex object." *See* Final Act. 12 (citing Wong 21:12–55, 25:42–60; Ng 7:51–56); Ans. 29–30.

Appellant argues that Wong fails to "describe any form of a 'System of Engagement', or a 'System of Engagement' that uses a 'System of Engagement' application." Appeal Br. 37; *see also* Reply Br. 21–22.[5]

Appellant's arguments are unpersuasive because, as the Examiner correctly notes, the Specification fails to explicitly define a "System of Engagement." Ans. 29. The Specification instead

[5] Appellant's arguments in the Reply Brief are based in part on "Appendix A" to the Reply Brief. *See* Reply Br. 21. This appendix (actually titled "Appendix I") reproduces an article, no longer available at the URL provided in the appendix, by Erica Toelle: *Systems of Record versus Systems of Engagement*, purportedly previously available at https://www.recordpoint.com/system-record-system-engagement/ (Dec. 18, 2017). *See* Reply Br. 37–38. This article constitutes evidence not previously before the Examiner. Therefore, this article is not properly before us and we have not considered it. *See* 37 C.F.R. § 41.33(d) (2018) (limiting admissibility of evidence after an appeal has been filed).

identifies "a MicroBlogger system" as an example of a System of Engagement. *See* Spec. ¶ 2. Appellant fails to identify any distinguishing features that define a System of Engagement in either the Specification or in the claim recitations. Moreover, Wong's system provides for engagement by enabling users to send and receive messages (Wong 21:12–55) and to edit their profiles and view the profiles of others (*id.* at 25:42–60). That is, Wong's system enables users to communicate (i.e., engage) with each other. Therefore, we agree with the Examiner that Wong teaches or suggests "wherein the complex object describes an entity in a System of Engagement," and further "wherein the System of Engagement uses a System of Engagement application to retrieve and provide data to a particular user according to the constraint, the attributes, and the method of the complex object," as recited in claim 1. *See* Final Act. 12; Ans. 29–30.

The Examiner finds Ng's class-to-table mapping, which includes generating stored procedures "to perform routine operations on objects such as Add, Delete, Modify and Retrieve data entries in the database" (Ng 8:52–54) teaches or suggests "analyzing . . . the object model to determine . . . at least one desired data service representing an object service interface for accessing the complex object" and "generating . . . at least one data service for the complex object in the cloud environment, based on the desired . . . at least one data service" (Final Act. 10 (citing Ng 7:43–45, 7:57–63, 8:47–54, 11:20–29)).

Appellant argues the Examiner erred because "[t]here is no mention [in Ng] of any type of 'interface' *for accessing* a complex

object" and that "tables are created from classes – without regards to any 'complex object' or interface-access thereto." Appeal Br. 33; *see also* Reply Br. 18. Appellant argues, in particular, that "data stored in a 'database' is retrieved – and the Ng 'database' is not equivalent to the claimed 'complex object' since Ng does not describe obtaining a 'class' (which is alleged as being equivalent to the claimed 'object model') *of* the 'database.'" Appeal Br. 34; *see also* Reply Br. 18. Appellant further argues "Ng does not describe generating such data service with such 'based on' characteristics since it does not describe a 'desired data service' *representing an object service interface for* ***accessing*** *the complex object*." Appeal Br. 35; *see also* Reply Br. 19.

Appellant's arguments unpersuasively fail to distinguish the claimed *determining* and *generating at least one desired data service representing an object service interface* from Ng's stored procedures, "generated to perform routine operations *on objects* such as Add, Delete, Modify and Retrieve data entries in the database." Ng 8:52–54 (emphasis added). As Ng teaches, "tables in the database hav[e] rows and columns corresponding to . . . one or more classes." *Id*. at 7:64–65. A "class having multiple field entries is mapped to a single table wherein each column corresponds to each of the multiple fields" and where a "row is added to the table for each object instance of the class stored in the database." *Id.* at 8:4–8. Moreover, Ng explicitly discloses the generated stored procedures correspond "to operations typically performed on objects in the object-oriented application." *Id.* at 8:47–48; *see also id.* at Fig. 6. Therefore, we agree with the Examiner that the generated stored procedures of Ng, which provide routines for

adding, deleting, modifying, and retrieving data entries representing object data, provide interfaces to the objects themselves. *See* Final Act. 10; Ans. 25.

For these reasons, we sustain the Examiner's 35 U.S.C. § 103 rejection of claim 1, and claims 12 and 20, which Appellant does not argue separately. *See* Appeal Br. 32.

Appellant purports that claims 4, 7–11, 15, and 18 are part of four separately patentable groups of claims. *Id.* at 50–56; Reply Br. at 29–32. Appellant's arguments, however, are premised on alleged deficiencies in Ng that Appellant argues with respect to claim 1. *See, e.g.*, Appeal Br. 53 (in Ng "a 'class' is translated to table entries in a database – without regards to a 'data service' *of* a 'complex object'"); *compare with, e.g.*, *id.* at 32–35. Appellant merely adds that Mazhar and Kawaii—considered separately and not in combination with Ng—fail to cure the alleged deficiency of Ng. *See id.* at 53–56. But as we do not agree that Ng is deficient, and as non-obviousness cannot be shown by attacking references individually (*Keller*, 642 F.2d at 426), Appellant's arguments are not persuasive of error. Accordingly, we also sustain the Examiner's 35 U.S.C. § 103 rejection of claims 4, 7–11, 15, and 18.

Claims 2 and 13

Claim 2 recites *search-able*, *follow-able*, *tag-able*, and *comment-able* constraints on the *complex object*. The Examiner finds that Wong teaches or suggests each of the recited constraints. *See* Final Act. 13 (citing Wong 24:57–59, 25:42–60, 25:58–60, 26:5–12, 26:53–61); Ans. 43–51.

Appellant contends the Examiner erred because Wong does not have a "specific 'constraint' that indicates that a 'complex object' may be 'searched.'" Appeal Br. 45–46; *see also* Reply Br. 27 ("Wong – whose teachings are devoid of any object model or complex object characteristics – teaches an ability to search for actual 'attributes' themselves").

Appellant's arguments are not persuasive because Wong teaches that users can make certain information private and see the public profile information of others. *See* Wong 25:45–52 (cited in Ans. 44). Moreover, the Examiner properly relies on Ng to teach or suggest the claimed complex object. *See, e.g.*, Final Act. 9. We agree with the Examiner that being able to make such information private teaches or suggests making a complex object searchable (i.e., by making data of the complex object public) or not searchable (i.e., by making all of the complex object's data private). *See* Ans. 44. Therefore, we agree with the Examiner that Wong teaches or suggests the claimed *search-able* constraint. *Id.*

Appellant argues the Examiner erred because Wong does not mention "a specific constraint that indicates that a 'complex object' has a relationship with 'other objects' that follow the 'complex object.'" Appeal Br. 46; *see also* Reply Br. 28. Appellant further argues Wong's "follow me feature" is "a '*people*-based' parameter." Appeal Br. 46.

Appellant's argument are unpersuasive because Wong enables a user to "invite other users to follow him/her." Wong 26:53–54 (cited in Final Act. 13). Moreover, the Examiner properly relies on Ng to

teach or suggest the claimed complex object. *See, e.g.*, Final Act. 9. Ng's complex objects can represent information about people. *See* Ng 9:33 (noting use of a customer object). We agree with the Examiner that Wong's invitation to follow—which, when combined with Ng, would indicate that an object representing the user can be followed—teaches or suggests the claimed *follow-able* constraint. Final Act. 9; Ans. 45.

Appellant further argues the Examiner erred in finding Wong teaches or suggests a *tag-able* constraint because "the tag-able constraint (1) is object-based, and (2) pertains to specific 'searching' with respect to a 'complex object.'" Appeal Br. 46; *see also* Reply Br. 28. Appellant similarly argues the Examiner erred in finding Wong teaches or suggests a *comment-able* constraint because "Wong describes currency, proxy, plans, messages – and that a user can edit their profile – without regards to characteristics/features pertaining to a 'complex object' or traits thereof." Appeal Br. 46.

Appellant's arguments are not persuasive because the Examiner properly relies on Ng to teach or suggest the claimed complex object (*see, e.g.*, Final Act. 9) and because Ng's complex objects can represent information about people (*see* Ng 9:33). The Examiner also properly relies on Wong's list of friends and profile information features to teach or suggest making information *tag-able* and *comment-able*. *See* Final Act. 9 (citing Wong 25:45, 25:58–60, 6:5–12). Thus, the combination of Ng and Wong teaches or suggests that enacting edits to information about a user (e.g., to the user's list of

friends or profile) by enabling editing a complex object representing information about the person.

For these reasons, we sustain the Examiner's 35 U.S.C. § 103 rejection of claim 2, and claim 13, which Appellant does not argue separately. *See* Appeal Br. 44.

Claims 3 and 14

In rejecting claim 3 as obvious, the Examiner finds that Ng's class hierarchy teaches or suggests "wherein the object model further comprises information describing . . . a relationship . . . of the complex object." Final Act. 14 (citing Ng 7:57–63); *see also* Ans. 54.

Appellant argues the Examiner erred because in Ng "[t]here is no mention of a 'complex object', and therefore [Ng] cannot describe that an 'object model'/'class' includes information describing a relationship or conditions-action '*of* the complex object.'" Appeal Br. 49. This argument is similar to unpersuasive arguments Appellant makes with respect to claim 1. *See id.* at 37–38. It is, therefore, unpersuasive for similar reasons.

Appellant also argues that it is not enough "that an object model/class can have relationships with other classes, including relationships with other classes," to demonstrate "obviousness with respect to the claimed 'object model' and 'complex object' synergistic interplay, where one (the 'object mode[l]' itself) describes characteristics/features (relationship/conditions-actions) of the other (the 'complex object')." Appeal Br. 50; *see also* Reply Br. 28–29.

Appellant's arguments are unpersuasive because they are not commensurate with the scope of claim 3. *See* Ans. 54 (Appellant's

arguments fail to "specifically point[] out how the language of the claims patentably distinguishes them from the references"). Claim 3 does not have any "synergistic interplay" recitations or recitations requiring that one object describes "characteristics/features" of another object. Rather, claim 3 recites that *the object model comprises information describing a relationship of the complex object*. Appellant fails to distinguish this recitation from Ng's class hierarchy teachings—which describe the relationship between subclasses and superclasses, such that objects instantiated by the subclass inherit methods, fields, and other object-oriented characteristics of the superclass. *See* Ng 7:60–62 (cited in Final Act. 14).

Accordingly, we sustain the Examiner's 35 U.S.C. § 103 rejection of claim 3, and claim 14, which Appellant does not argue separately. *See* Appeal Br. 48.

Claims 5 and 19

In rejecting claim 5 as obvious, the Examiner finds that Crockett's use of multiple forms of data storage, including text files, combined with Vlahos's querying from wrapped data sources teaches or suggests the claim 5 limitation that "establishing of a mapping from the . . . attributes to the corresponding data storage based on the extracted metadata" comprises "determining . . . that the attributes are . . . text data to be retrieved" and "mapping . . . the text data to be retrieved to an index database system in response to determining that the attributes are the text data to be retrieved." Final Act. 22–23 (citing, e.g., Crockett ¶¶ 204–05; Vlahos ¶¶ 68, 82, 84); *see also* Ans. 70–75.

> Appellant argues the Examiner erred by failing
>
> to establish a teaching of the specific claimed features of: (i) an index database system, (ii) text data to be retrieved, or (iii) mapping text data (to be retrieved) to an index database system, where such mapping *is specifically invoked/triggered by a determination that the 'attributes' of a complex object are the text data to be retrieved*.

Appeal Br. 63; *see also* Reply Br. 34–35.

Appellant's arguments are unpersuasive because Vlahos wraps data sources such that records can be retrieved from a cache instead of directly from the data sources, when the records exist in the corresponding cache. Vlahos ¶ 82 (cited in Final Act. 23). Wrapper caches can be implemented in relational databases (*id.* ¶ 69) and different data sources are wrapped by different wrappers (*id.* ¶ 62, Fig. 3). Thus, in Vlahos, queries to a particular data source, such as text data (*see id.* ¶ 68 (flat text files); *see also* Crockett 204–05), are mapped to the wrapper for the particular data source (Vlahos ¶ 82, Fig. 3). Moreover, the particular wrapper, having a relational database to cache records for retrieval (i.e., that are indexed so that queries can be used to obtain results without directly searching the cached data source) teaches or suggests an index database system. Therefore, we agree with the Examiner that the combination of Crockett and Vlahos teaches or suggests "mapping . . . the text data to be retrieved to an index database system in response to determining that the attributes are the text data to be retrieved," as recited in claim 5. *See* Final Act. 22–23.

Accordingly, we sustain the Examiner's 35 U.S.C. § 103 rejection of claim 5, and claims 19, which Appellant does not argue separately. *See* Appeal Br. 62.

Claims 6 and 17

In rejecting claim 6 as obvious, the Examiner finds that Ng's generated stored procedures "to perform routine operations on objects such as Add, Delete, Modify and Retrieve data entries in the database" (Ng 8:52–54) and generated "object-oriented methods corresponding to other stored procedures" (Ng 10:63–64) teaches or suggests "determining . . . in response to the information describing the attributes of the complex object, a first interface for adding, deleting, modifying and querying the attributes" and "determining . . . in response to the information describing the method of the complex object, a second interface for exposing a public method" (Final Act. 19 (citing Ng 8:52–54, 10:63–67)). *See also* Ans. 67–70 (citing Ng 7:49–52, 8:47–64, Fig. 6).

Appellant argues the Examiner erred because in Ng "'stored procedures' are generated – without any type of invocation/triggering mechanism that is based on characteristics of a 'complex object.'" Appeal Br. 60; *see also* Reply Br. 33–34. Similarly, Appellant argues the Examiner erred because in Ng "'methods' are generated – without any type of invocation/triggering mechanism that is based on characteristics of a 'complex object.'" Appeal Br. 61.

Appellant's arguments are unpersuasive because, as discussed above with respect to the Examiner's obviousness rejection of claim 1, Ng generates stored procedures (i.e., interfaces) "to perform routine

operations *on objects* such as Add, Delete, Modify and Retrieve data entries in the database." Ng 8:52–54 (cited in Final Act. 19) (emphasis added). Moreover, Ng's classes have methods that "are used to manipulate the objects derived from the corresponding classes." *Id.* at 7:54–56. The Examiner's findings show that Ng's teaching of generating methods to provide access to stored procedures (Ng 10:63–64) suggests generating a stored procedure (i.e., an interface) to access a method. *See* Final Act. 19. We agree with the Examiner that generating an additional interface would have been obvious as a way of providing the ability to manipulate objects using their methods rather than only enabling *routine* operations to be performed on the objects. *See* Ans. 68.

Accordingly, we sustain the Examiner's 35 U.S.C. § 103 rejection of claim 6, and claim 17, which Appellant does not argue separately. *See* Appeal Br. 59.

Claim 16

In rejecting claim 16 as obvious, the Examiner finds that Shiffer's determination as to whether input data is structured, and extracting individual records for indexing, teaches or suggests "program instructions to determine that the attribute is any one of structural data, semi-structural data, non-structural data, spatial data and text data to be retrieved based on the extracted metadata" and "program instructions to map the attribute to a relational database in response to determining that the attribute is the structural data." Final Act. 18 (citing Shiffer ¶ 159); *see also* Ans. 63–66.

Appellant contends the Examiner erred because in Shiffer

> 'search results' are placed within an index that is associated with a metadata store or content store if the search query input data is non-structured; and 'individual records' of a structured XML search query are extracted for indexing if the search query input data is structured – without regards to any database/ system-based mapping that is specially invoked/triggered based on the type of the attribute defined by an object model of a complex object.

Appeal Br. 58; *see also* Reply Br. 33. Appellant further argues Shiffer's "system can determine if the input data is unstructured or structured – without regards to any use of ('based on') 'extracted metadata.'" Appeal Br. 58; *see also* Reply Br. 32–33.

Appellant's argument are unpersuasive because the Examiner, in rejecting claim 15 (from which claim 16 depends), finds that the combination of Ng and Mazhar teaches or suggests mapping an attribute to a corresponding data storage based on metadata extracted from an object model. *See* Ans. 64; Final Act. 14 (citing Ng 8:1–7, 8:47–54; Mazhar ¶¶ 35–36), 17. The Examiner properly relies on Shiffer's structured data categorization to teach or suggest use of the extracted metadata to determine if the attribute is "any one of structural data." *See* Final Act. 18. Moreover, Shiffer teaches that structured data can be handled by (i.e., be mapped to) a relational database. Shiffer ¶ 159. Therefore, we agree with the Examiner that the combination of Ng, Mazhar, and Shiffer teaches or suggests "program instructions to determine that the attribute is any one of structural data, semi-structural data, non-structural data, spatial data and text data to be retrieved based on the extracted metadata" and "program instructions to map the attribute to a relational database in

response to determining that the attribute is the structural data," as recited in claim 16. *See* Final Act. 14, 17–18.

Accordingly, we sustain the Examiner's 35 U.S.C. § 103 rejection of claim 16.

CONCLUSION

Claims Rejected	**35 U.S.C. §**	**References/ Basis**	**Affirmed**	**Reversed**
1–10, 12–20	101	Eligibility	1–10, 12–20	
1–4, 7–15, 18, 20	103	Ng, Mazhar, Kawai, Wong	1–4, 7–15, 18, 20	
5, 19	103	Ng, Mazhar, Kawai, Wong, Crockett, Vlahos	5, 19	
6, 17	103	Ng, Mazhar, Kawai, Wong, Gorelik	6, 17	
16	103	Ng, Mazhar, Kawai, Wong, Shiffer,	16	
Overall Outcome			**1–20**	

TIME PERIOD FOR RESPONSE

No time period for taking subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

THOMAS, *Administrative Patent Judge,* concurring in part and dissenting in part.

On slightly different determinations, I might join the analysis of my colleagues with respect to the §101 rejection of claims 1–10 and 12–20. Although the majority has properly summarized the law and general two-part test for determining whether the claimed subject matter is patent eligible under the *Alice/Mayo* framework, which I do not repeat here, I write separately because I find the majority's application of the test to the facts partly conflates "abstract concepts" with "additional elements."

Specifically, the majority point out that claim 1 recites "obtaining . . . analyzing . . . and generating." Decision 10. The majority thereafter determines, that "the claimed steps are similar to patent-ineligible mental processes." *See id.* at 11.

However, beyond the abstract ideas noted above in the Prong-1 analysis, claim 1 also recites several additional elements: "a cloud environment," "one or more processors," "a System of Engagement," "a System of Engagement application," "data storage," "data service," and "an object service interface." Although such additional elements are discussed in the majority's step 2B analysis (*see* Decision 16), the majority fails to distinguish the additional elements under the Prong 2 analysis.[6] In

[6] I acknowledge that some of the considerations at Step 2A, Prong 2, properly may be evaluated under Step 2 of *Alice* (Step 2B of the Office revised guidance). For purposes of maintaining consistent treatment within the Office, we evaluate them under Step 1 of *Alice* (Step 2A of the Office revised guidance). *See* Revised Guidance, 84 Fed. Reg. at 55 n.25, 27–32.

any case, it appears that the majority is noting the "generating" step as both an "abstract idea," i.e., a mental process and as an "additional element."

Under the Revised Guidance, we must determine if *additional elements* in the claims integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)). It is my opinion that the majority Decision should clearly treat the "generating . . . at least one data storage and at least one data service" as an additional element, as opposed to suggesting it is also an abstract idea, for the purpose of determining whether this step integrates the judicial exception into a practical application. I thus concur in the affirmance of the § 101 rejection but clarify that the "generating step" should be one or the other, abstract idea or additional element, but not both.

Regarding the § 103 rejection, I disagree with the majority in affirming this rejection. In particular, I disagree with the majority's adoption of the Examiner's interpretation regarding the claimed "complex object" feature.

For example, Claim 1 recites "obtaining . . . an object model of the complex object . . . wherein the complex object describes an entity in a System of Engagement." *See* claim 1. Similarly, Appellant's Specification states that "'a complex object' is used to represent an object describing an entity in the System of Engagement application." *See* Spec. ¶ 56. As such, I believe both claim 1 and Appellant's Specification requires "a complex object" to describe an entity in a System of Engagement. Additionally, claim 1 requires the complex object to be continuously evolving with growing data and a varying structure.

The Examiner admits that Ng "does not appear to explicitly teach . . . the complex object describes an entity in a System of Engagement." *See* Final Act. 10. Instead, the Examiner clearly relies upon Wong to teach the System Engagement feature. *Id.* at 12. However, the majority is dismissing the Examiner's findings and asserts that Ng also arguably teaches a System of Engagement, without properly noting this as a new ground. *See* Decision 24. The majority further dismisses the Examiner's finding that Wong does not teach a complex object, again without noting this as a new ground. *Id*. at 24–25.

My remarks are based on the Examiner's explicit findings, which Appellant is responding thereto. In other words, in the Final Action, because the Examiner is relying on Wong (not Ng) to teach a System Engagement, it appears to me that the Examiner should also be relying on Wong, not Ng, to teach or suggest the claimed "complex object." As noted by Appellant, and I agree,

> the Examiner has failed to identify [in the Final Action] what aspect of Ng is alleged to be equivalent to the claimed 'complex object' – instead asserting that Ng's 'class' is equivalent to the claimed 'object model,' but providing no guidance as to what element of Ng is equivalent to the claimed 'complex object.'

Appeal Br. 34.

In any case, Appellant argues that *neither* Ng nor Wong teaches or suggests the "complex object." *See* Appeal Br. 36. The majority also acknowledges that Appellant contends that neither Ng nor Wong teach a "complex object." *See* Decision 22. Yet, the majority accuse Appellant of attacking the references individually. *Id.* at 23. I disagree with the majority that Appellant are arguing the references individually with regard to the

"complex object" limitation, given that Appellant argues the neither Ng nor Wong teach this limitation. Arguing the references individually implies that Appellant only argues a single reference, the references that is not being specifically relied upon. That is not the case here. Unfortunately, because the majority believes Appellant is arguing the reference individually, some arguments made by Appellant are ignored.

The majority also states that they "agree with the Examiner that Wong teaches or suggests 'wherein the complex object describes an entity in a System of Engagement." Decision 26. It is not clear to me how the majority in one instance can say that the Examiner does not rely on Wong to teach the "complex object" (*see* Decision 23) and then on the other hand state that they agree with the Examiner that Wong teaches the complex object describes an entity in a System of Engagement. Stated differently, if the majority agrees with the Examiner that Wong does not teach the "complex object" then how can Wong teach that the complex object describes an entity in a System of Engagement?

Finally, in the Answer, the Examiner appears to clarify that "the objects of Ng are representative of the complex object . . . the complex object was equivalent to the object." Ans. 25–26. However, claim 1 requires that that complex object (1) describes an entity in a System of Engagement; and (2) is continuously evolving with growing data and a varying structure. *See* claim 1. The Examiner clearly admits that Ng does not teach limitations (1) and (2), but instead relies upon Wong and Kawai, respectively. *See* Final Act. 11–12. However, the majority's Decision is a bit fuzzy regarding which findings the majority are relying on, the

Examiner's or the new findings noted supra in the Decision, which clearly contradict the Examiner's findings.

In any case, I am particularly troubled by the chain of causation that is split between the multiple references in the *Examiner's* proffered combination of Ng, Wong, and Kawai. Here, the Examiner has merely shown that Ng teaches objects, but has not shown in Ng the descriptive limitations that signify a "complex object." Also, the Examiner's proffered evidence does not show a linkage between Ng's objects and Wong's alleged System of Engagement and/or Kawai's continuously evolving object.

As such, I believe the Examiner has resorted to speculation, unfounded assumptions, or hindsight reconstruction to supply deficiencies in the factual basis. *In re Warner,* 379, F.2d 1011, 1017 (CCPA 1967).

Therefore, I find persuasive Appellant's arguments that neither Ng nor Wong teach a complex object because without illustrating a nexus between Ng, Wong, and Kawai objects, the Examiner's reasons to combine are merely conjecture.

Respectfully, I would reverse the Examiner's obviousness rejection of the claims.