

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Teradata Operations, Inc.
Petitioner

v.

Berkeley*IEOR
Patent Owner

Case CBM2019-00011
Patent No. 8,612,316

PATENT OWNER'S PRELIMINARY RESPONSE

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LISTING OF EXHIBITS

Exhibit No.	Description
2001	Declaration of Jon Scarborough
2002	File History for U.S. Patent No. 7,596,521
2003	U.S. Patent No. 7,596,521

I. Introduction

Institution must be denied because Petitioner fails to establish that the challenged claims of US 8,612,316 (the “‘316 patent”) are “more likely than not” unpatentable under 35 U.S.C. § 324(a). Indeed, Petitioner falls well short of meeting its burden. Each ground, as well as Petitioner’s assertion that the ‘316 patent is not a “technological invention[.]” under 37 C.F.R. § 42.301(b), relies on Petitioner stripping express claim limitations that would be dispositive if properly recognized and addressed.

In particular, the ‘316 patent claims recite more than merely “calculating profit using a general ledger,” or “calculating object level profitability,” as Petitioner contends. Paper 1, pp. 7, 18. They also recite particularized technological improvements in the software arts resulting in a *faster* computerized profit calculator capable of “simultaneously support[ing] **the number of calculation permutations required**” by large enterprises – something conventional software solutions could not do. Ex. 1001, 10:45-47 (emphasis added).

These improvements are both disclosed and claimed, and include, among others:

(1) RDBMS calculations: The invention performs core profitability calculations *inside* a relational database management system (“RDBMS”), rather than performing calculations inside a procedural-based software application, as was

done previously. Ex. 1001 at claim 1, 29:5-6 (“**using** the relational database management system **to ... calculate**”) (emphases added). This improvement substantially reduced the processing time a procedural-based software application would need to complete the same number of calculations.

(2) Independent calculations: The invention also decomposes the calculation processing into *independent* profitability calculations so the RDBMS can perform multiple calculations simultaneously (i.e., in parallel). Ex. 1001 at claim 1, 29:5-7 (“**independently** calculate[ing] at least one marginal value of profit for each object being measured”) (emphasis added). Incorporating this improvement made it possible to process calculations simultaneously (i.e., in parallel) on separate processors in a multi-processor RDBMS platform, which reduced the processing time even further.

As the inventor, Mr. Richard “Tad” Lepman, explains in the file history:

I have implemented the invention **within a relational database, which has not been done before** and allows the information to be analyzed in **hours instead of days** for a major Bank using **parallel calculations processes**.

Ex. 1015, p. 412 (emphases added).

The ‘316 patent also discloses and claims “specific steps for achieving the desired result” of a faster profit calculator, which section 101 case law

overwhelmingly favors over patents and claims reciting the result alone. *Finjan Inc. v. Blue Coat Systems, Inc.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018).

Petitioner’s arguments that the claims are merely directed to “[c]alculating profit using a general ledger” or “calculating object level profitability” depend on ignoring these claimed features, which is not permitted, and the entire Petition collapses when they are considered. Paper 1, pp. 7, 18. “Mere conclusory statements that do not address the claimed invention as a whole are insufficient to satisfy Petitioner’s burden.” See *Crane Merchandising Systems, Inc., v. NewZoom, Inc.*, CBM2017-00054, Paper 13 at 6 (PTAB February 19, 2019). For these reasons, and as detailed below, institution must be denied.

II. Relationships Among the Patents and Claims in This Three-Patent Family

On November 13, 2018, Petitioner filed six petitions challenging the claims of US 7,596,521,¹ US 7,882,137, and US 8,612,316 (collectively, the “Lepman Patents”). For each Lepman Patent, a first petition targets claim 1 as its broadest claim, while a second petition targets dependent claim 2:

Case No.	Patent No.	Claim 1 or 2
CBM2019-00015	7,596,521	Claim 1
CBM2019-00016	7,596,521	Claim 2
CBM2019-00009	7,882,137	Claim 1
CBM2019-00013	7,882,137	Claim 2

¹ The file history of the ‘521 patent is submitted herewith as Ex. 2002.

CBM2019-00011	8,612,316	Claim 1
CBM2019-00014	8,612,316	Claim 2

Each of the Lepman Patents share a common specification (with a few minor variations) and recite similar limitations in claims 1 and 2, respectively. Much of the analysis of this Preliminary Response focuses on claim limitation 1[e] (see Paper 1, Appendix 1), which is identical to claim limitation 1[d] in the ‘521 patent and claim limitation 1[e] in the ‘137 patent.² See Ex. 2001, Appendix B.

III. Overview of the ‘316 patent

The ‘316 patent, like the other Lepman Patents, discloses and claims a particularized technological solution to a business problem and a technical problem. Ex. 2001, ¶ 33, 103. Each are described below in turn.

A. Business Problem and Solution: More Detailed Profitability Measures

Prior to the ‘316 patent filing, businesses struggled to accurately measure profit contribution at a resolution necessary to make strategic decisions. Traditionally, a company’s best resource for understanding its profits came from its financial statements—typically compliant with Generally Accepted Accounting

² Should the Board decide, however, to institute CBM review, Patent Owner reserves the right to identify particular differences among the claims of the Lepman Patents in relation to other claim limitations in the Patent Owner’s response.

Principles (GAAP)—such as balance sheets, income or loss and cash flow financial statements. Ex. 1001, 1:22-25. Such traditional financial statements reported on profits in the aggregate (e.g., subsidiary-wide or possibly division-wide). *Id.*, 1:63-67. However, understanding a corporation’s profitability as a whole, or that of a subsidiary or division, would not enable management to understand, for example, which individual customers, accounts or transactions impact profitability, and by how much. *Id.*, 1:63-67.

To address this business problem, the ‘316 patent discloses specific methods for calculating profitability associated with the smallest common component of profit measurement desired—namely, the profit “object.” *Id.*, 4:11-12. Examples of profit measurement objects referenced in the ‘316 patent’s specification include an insurance company using a “policy” object, a bank using an “account” object, and an airline using a “seat” object. *Id.*, 7:33-35

Expanding on the airline example, the claimed inventions enable an airline to measure profitability at the “seat” level -- each seat of each segment of each flight of each origin or destination. *See generally id.*, 22:61-65. Based on that measure, the airline could determine, for example, which seats on particular flight segments positively or negatively impact profitability, and by how much, relative to the others. *Id.* Profitability measurements for each seat could then be aggregated from the

bottom up to determine which flights, aircraft, or destinations positively or negatively impact profitability, and by how much. *Id.*

B. Technical Problem and Solution: Processing Object Level Profitability on a Massive Scale

1. Performance Limitations in Prior Art Attempts

The specification and file history acknowledge others attempted to provide purported detailed profitability measures prior to the '316 patent using traditional "procedural based software." Ex. 1001, 10:43-47; Ex. 1015, p. 408, 412. Those prior attempts, however, experienced "limited success" by needing "days" to process "the information to be analyzed," which was insufficient. Ex. 1015, p. 408, 412.

One prior attempt is disclosed in a reference Petitioner proffers. *See* Ex. 1009 ("Stuchfield"). Stuchfield is a publication describing a system purportedly capable of assigning profit values to a financial service firm's individual stock transactions. Ex. 1009, p. 1. Even if Stuchfield succeeded in providing more detailed profitability measures compared to its predecessors, Stuchfield processed only 6,000 trade transactions each day and calculated profitability merely once every three months - - i.e. "quarterly." Ex. 1009, p. 1, 20.

By contrast, Mr. Lepman developed a substantially more efficient profit calculator for "large businesses with many millions of customers" capable of "allow[ing] the information to be analyzed in hours instead of days." Ex. 1001, 1:66-

67; Ex. 1015, p. 412. Mr. Lepman did so by incorporating into his invention several particularized technological improvements, two of which are addressed in detail in this Preliminary Response: (1) performing core profitability calculations inside a relational database management system (“RDBMS”), rather than performing calculations inside a procedural-based software application, as was done previously; and (2) decomposing profitability factors into *independent* calculations so the RDBMS could perform multiple calculations simultaneously (i.e., in parallel) and on separate processors. Because Petitioner effectively ignores the presence of these two improvements, they will be explained in more detail here.

2. Taking Advantage of an RDBMS’s Calculation Capabilities

The first of the two technical improvements discussed extensively in this Preliminary Response includes using the RDBMS, rather than traditional procedural software, to perform profitability calculations. Ex. 1001, 10:42-47 , claim 1 (“using the relational database management system to ... calculate”); Ex. 2001, ¶¶ 45, 68-71. The specification explains the purpose of this technological improvement:

This approach allows for a **relational database management system implementation (42)**. It is nearly impossible [to] develop and maintain **procedural based software** with as much **flexibility and with the capability to simultaneously support the number of calculation permutations** required

Id., 10:42-47 (emphases added). The above passage identifies a distinction between relying on traditional “procedural based software” for profitability calculations, on one hand, and, on the other hand, relying on the “relational database management system” – to provide sufficient “flexibility and with the capability to simultaneously support the number of calculation permutations required.” *Id.*; Ex. 2001, ¶ 45.

Patent Owner’s technical expert, Mr. Jon Scarborough, explains the significance of this distinction. At the time of the invention in the late 1990s, financial accounting and reporting platforms used by large enterprises traditionally relied on multi-tier architecture designs that delegated certain types of tasks to each tier. Ex. 2001, ¶ 58. For example, SAP-IS-B (Ex. 1007), offered by Petitioner, discloses a three-tier architecture:

SAP-IS-B’s “three-tier” architecture

The standard R/3 System architecture consists of a three-tier hierarchy comprising:

- ❑ a host (database server) for carrying out all functions requiring access to the database.
- ❑ connected to this, several application servers for carrying out the actual dialog processing
- ❑ linked to this, in turn, several workstations (presentation servers) for the presentation functions.

Ex. 1007, p. 19 (annotated).³ At one tier, SAP-IS-B's "database server" (which hosts the RDBMS) "carr[ied] out all functions requiring access to the database." Ex. 1007, p. 19; Paper 1, p. 92 (identifying SAP-IS-B's database server as hosting "well-known RDBMSs," such as "DB2, Oracle and MS SQL"); Ex. 2001, ¶ 59. At another tier, SAP-IS-B's "application servers" hosted and carried out "the actual dialog processing," of SAP's software applications, including the "dialog-based" / "dialog-oriented" costing and profitability calculations of the Cost Accounting and Bank Profitability Analysis modules. Ex. 1007, p. 10, 19, 60; Ex. 2001, ¶¶ 60-62. Conventional solutions traditionally relied on these types of "tiered" software applications for performing core profitability calculations, which Mr. Lepman refers to as "procedural software" in the patent specification. Ex. 1001, 10:42-47; Ex. 2002, p. 118; Ex. 2001, ¶¶ 63-65.

There were some benefits to using traditional procedural software applications (such as SAP's Cost Accounting and Bank Profitability Analysis modules) to analyze and perform calculations and other business logic on the data in the database.

³ Petitioner cites the internal (non-Bates) page numbers for E&Y (Ex. 1005), Blain (Ex. 1006), and Kimball (Ex. 1010), but cites the Bates-stamped (non-internal) page numbers for SAP-IS-B (Ex. 1007). See Paper 1, p. 12. Patent Owner follows the same procedure here.

Ex. 2001, ¶¶ 66-67. Software application programming languages, such as SAP’s Advanced Business Application Programming Language (“ABAP”) or Common Business-Oriented Language (“COBOL”, typically associated with IBM), made it *easy* for application programmers to program software for accounting or profitability-related business logic functions. *Id.*, ¶ 66. In fact, the acronyms ABAP and COBOL respectively refer to “Advanced **Business** Application Programming Language” and “Common **Business-Oriented** Language.” Ex. 1007, p. 86; Ex. 2001, ¶ 67.

Relying on traditional software applications came at a cost, however. Because an enterprise’s data and application software typically resided in separate database and application servers (like the SAP-IS-B example discussed above), performing calculations within the application server required spending additional time transmitting data between the database and application servers, among other tasks associated with “marshalling” data between servers and environments. Ex. 2001, ¶ 68.

For this reason, Mr. Lepman moved the profitability calculation engine from the application server to the database server where the data itself resides. Ex. 1001, 10:48-54; Ex. 2001, ¶ 68. In particular, the ‘316 patent specification discloses “using” the RDBMS to, not only handle storage and access to the files of the database (its conventional functions), but also “using” the RDBMS ***itself*** to perform

profitability calculations. *Id.* Mr. Lepman explained the performance improvements he realized with this feature in a 2004 inventor declaration to the patent office:

I have implemented the invention **within a relational database**, which has not been done before and allows the information to be analyzed **in hours instead of days** for a major Bank using **parallel calculations processes**.

Ex. 1015, p. 412 (emphasis added).

3. Taking Advantage of Massively Parallel Computing Hardware

Mr. Lepman also shaped his invention to take full advantage of improved RDBMS hardware platforms having multiple processors capable of parallel processing. Ex. 1001, 4:5-9. While hardware platforms having multiple processors (referred in the specification to as “parallel” processing or “massively parallel” hardware) existed prior to the ‘316 patent’s filing, prior profitability solutions did not take full advantage of these hardware platforms’ parallel processing capabilities. Ex. 1001, 2:7-11; Ex. 2001, ¶¶ 72-75. As such, the ‘316 patent discloses and claims not only providing vastly more detailed measures of profitability, but also taking “advantage of technological advances in massively parallel computing capability.” Ex. 1001, 6:3-7; Ex. 2002, pp. 117-18.

Another advantage over conventional solutions relates to a challenge that arose when combining the ideas of (i) performing calculations inside the RDBMS

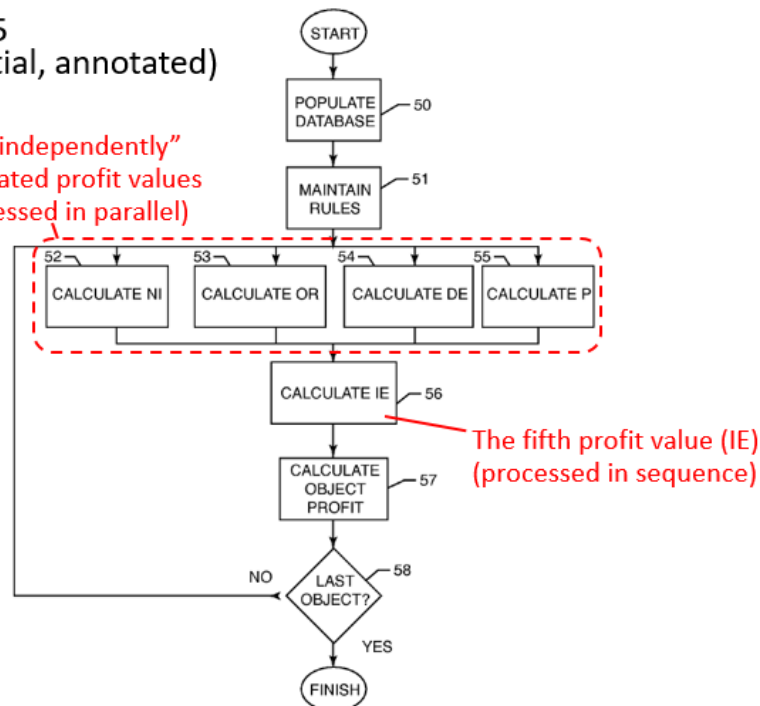
and (ii) parallel processing. Conventional profitability solutions relied on *dependent* calculations that would need to be executed in sequence. Ex. 2002, p. 203 (“Price teaches a sequential process, first classification and then aggregation”). A *dependent* calculation, relying on the result of a separate calculation, must wait for the separate calculation to complete first. Ex. 1001, 11:36-40; Ex. 2001, ¶¶ 76-79. Because of this dependency, it was not possible to process both calculations simultaneously (e.g. in parallel) in an RDBMS on separate processors. Ex. 2001, ¶ 80.

As such, Mr. Lepman arranged his method and calculations in a manner that enabled four profitability values – (1) net interest (“NI”); (2) other revenue (“OR”); (3) direct expense (“DE”); and (4) provisioning (“P”) – to be calculated “*independently*” of each other – thereby making it possible for the RDBMS to process multiple profit value calculations simultaneously and in parallel – rather than *dependently*, where calculations depending on prior calculations would execute in sequence. Ex. 1001, 11:36-40, claim 1 (“using the relational database management system to **independently** calculate”) (emphasis added); Ex. 2001, ¶ 81, 85.

Fig. 5 provides one example, illustrating that at least NI, OR, DE and P are calculated “independently” of each other (thereby taking advantage of parallel processing):

Fig. 5
(partial, annotated)

four “independently”
calculated profit values
(processed in parallel)



Ex. 1001, FIG. 5 (partial, annotated); Ex. 2001, ¶ 82. The specification explains the difference between the NI, OR, DE and P factors, which are processed “independently,” and the IE factor, which is processed “sequentially” because it requires values from prior calculations:

Steps 3, 4, 5, and 6 [referring to the NI, OR, DE and P calculations] can be processed **independently**; step 7 **requires values** derived in step 3, 4, 5, and 6 and therefore occurs **sequentially**.

Ex. 1001, 11:36-40 (emphasis added);

In sum [sic] implementations this calculation is **dependent** on object level calculations and therefore **processed sequentially** (e.g. ratios 3 & 6 below). Otherwise, when the IE rules are **independent** of object

level calculations IE can be processed **in parallel** with the other profit calculations (e.g. ratios 1, 2, 4, 5, & 7).

Ex. 1001, 19:55-61.

Likewise, during prosecution, Mr. Lepman explained to the examiner that taking advantage of “parallel” processing represents an improvement over the “sequential process[es]” of the prior art:

The invention allows for four of the five factors to be **processed in parallel** by a relational database management system (RDBMS) using formulas using selected object level data directly. Price teaches a **sequential process**, first classification and then aggregation, calculations are additions, without subsets.

Ex. 2002, p. 118 (emphasis added). As Mr. Scarborough explains, taking advantage of parallel processing reduces the time a system would need to process the same number of calculations. Ex. 2001, ¶¶ 72-75.

4. Placing “rules for processing” Inside the Database

To facilitate using the RDBMS to perform independent calculations on a massively parallel hardware platform, the ‘316 patent also discloses and claims incorporating the “rules for processing” into the RDBMS. Ex. 1001, 10:11-13 (“a calculation rule must be associated with an object, designating the methods DPM will use to calculate components of profit at the object level”); 29:1-2 (“establishing,

in the relational database, rules for processing”); 29:5-6 (“using the [RDBMS] to independently calculate ... using the established rules”).⁴

DPM is designed to allow the user the freedom **to associate a group of objects with a rule** and to use object-level information in combination with rule parameters to calculate profit values.

Ex. 1001, 8:30-33 (emphasis added); Ex. 2001, ¶¶ 86-88. In other words, rules defining how the objects are selected and how to perform the profitability calculations are written to the database itself alongside the object data (e.g. airline flights, seats) to be processed. Ex. 1001, 8:30-33; Ex. 2001, ¶ 87.

Placing the rules in the database together with the data facilitates using the RDBMS to perform the core profitability calculations (by applying “SQL” commands, for example). Ex. 1001, 31:12-13; Ex. 2001, ¶ 87. As the specification explains, this RDBMS solution, combined with the presence of the rules in the database, promotes “scalabil[ity]” referring to the ability of a system to maintain performance as the volume of data and number of rules grows:

The DPM invention uses profit measurement rules separate from, but applied to, object data and the use of

⁴ The ‘316 Patent frequently refers to the invention by using the name “DPM,” which is an acronym for “detail profit metric.” Ex. 1001, 5:63-64.

relational database concepts, giving the user flexibility in both the assignment and depth of definition of measurement rules and measurement resolution. Use of this method is especially suited for **massively parallel computing technology** where **linear scalable capital investment in processing technology is possible** vis-a-vis object and event count and rule complexity.

Id., 8:33-41 (emphasis added); Ex. 2001, ¶¶ 88-89. In other words, as the number of objects, rules and/or required calculations grew, more processors could be added to enable the calculation processing to conclude in the same amount of time. Ex. 1001, 8:33-41; Ex. 2001, ¶¶ 90-91.

5. **Teradata's Own Representations on the Speed of the Resulting Commercial Embodiment**

The file history of a parent application explains that Mr. Lepman and Teradata (a division of NCR Corporation at the time) worked together in building the first commercial embodiment of Mr. Lepman's inventions, which Mr. Lepman licensed to NCR. Ex. 1015, p. 409 ("In June of 1999, I, through Berkeley*IEOR, licensed the invention to NCR"). The commercial embodiment (named "Value Analyzer" or "Teradata Value Analyzer") combined the (i) software improvements of the Lepman Patents with (ii) the massively parallel hardware Teradata platform the Lepman Patents' software improvements were designed to execute on:

[I]f used in combination with the Teradata platform (a

relational database), [Teradata] Value Analyzer (the invention) is able to analyze enormous volumes of customer behavior data in hours, rather than days

Ex. 1015, p. 409, 424.

This commercial embodiment received much industry acclaim and Teradata itself recognized the performance improvements of the “Teradata Value Analyzer” in its own marketing literature:

Teradata Value Analyzer also delivers usable information with unmatched speed, despite the **complexity of the profitability calculations and the vast amount of data processed.**

Ex. 1015, p. 409, 447 (emphasis added);

Profitability calculations that might take other databases days to run can be completed in Teradata in a matter of hours or even minutes.

Ex. 1015, p. 409, 442.

* * * *

Thus, the ‘316 patent discloses and claims not only the idea of determining object level profitability, but also specific ways to take advantage of RDBMS capabilities and parallel processing that improved upon the capabilities and

performance of traditional procedural-based computer software, which largely relied on sequential and iterative processing and logic.⁵

IV. Summary of References Identified by Petitioner

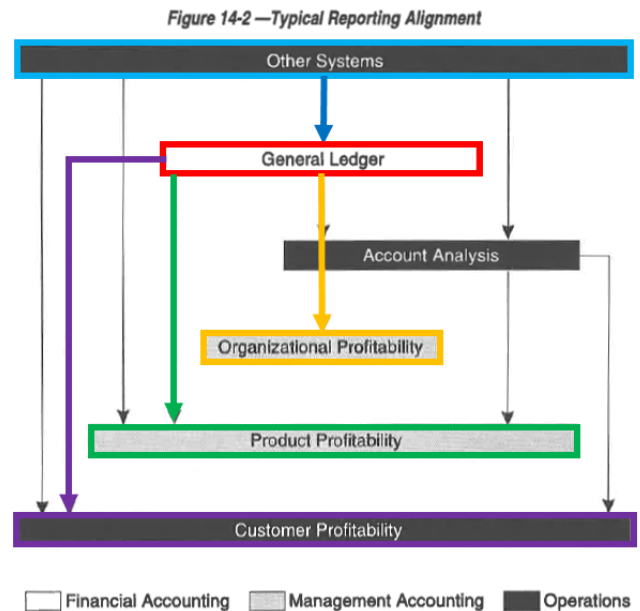
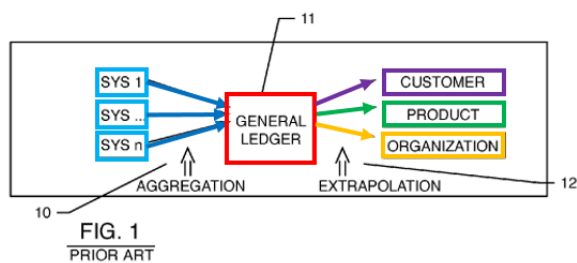
Grounds 2-11 of the Petition rely on four references: Ernst & Young, *The Ernst & Young Guide to Performance Measurement for Financial Institutions* (1995) (Ex. 1005, “E&Y”); Johnathon Blain et al., *Using SAP R/3* (1996) (Ex. 1006, “Blain”); *Detailed Functions – System R/3 - IS-B – The SAP Industry Solution For Banks* Ex. 1007, “SAP-IS-B”); and Ralph C. Kimball, *Calculating and Using Risk-adjusted ROE for Lines of Business*, Bank Accounting & Finance (1993) (Ex. 1010, “Kimball”). Each of these references is discussed below.

A. E&Y (Ex. 1005)

E&Y is a guidebook intended “to assist financial institutions with the design, implementations, and management of performance information.” Ex. 1005, p. 5. E&Y describes how an institution can proceed through strategic development of an information management system; conceptually design and implement the system; and ultimately use the information managed by the system. *Id.*, Figure 2-1.

⁵ Petitioner provides only a one-paragraph overview of the ‘316 patent, underscoring Petitioner’s failure to address the technical problems and solutions described and claimed therein. Paper 1, pp. 11-12.

While Petitioner states that E&Y was not considered during prosecution (Paper 1, p. 12), E&Y is similar to the references “describing generally accepted accounting principles and financial performance measurement procedures” incorporated by reference in the ‘316 patent. See Ex. 1001, 1:15-2:12. FIG. 1 of the ‘316 patent summarizes these prior approaches, where businesses apportioned or extrapolated information from the general ledger to see customer, product, or organization profit detail. *Id.*, FIG. 1. As evidenced by the comparison below, Figure 14-2 of E&Y (which illustrates a “typical reporting alignment”) is effectively equivalent to FIG. 1 of the ‘316 patent.



Ex. 1001, FIG. 1 (annotated); Ex. 1005, Figure 14-2 (p. 247) (annotated)

B. Blain (Ex. 1006)

Blain is a textbook describing SAP enterprise software systems. Ex. 1006, p. 1. The book is “partly technical, partly persuasive” and targeted towards current and prospective SAP users. *Id.*, p. 3; pp. 4-6. In particular, Blain describes SAP’s R/3 enterprise product that uses a three-tier system architecture including a database server, application servers, and client servers. *Id.*, pp. 90-91.

C. SAP-IS-B (Ex. 1007)

SAP-IS-B describes a “Solution for Banks (IS-B)” software tool “for dealing with industry-specific requirements in the areas of controlling, risk management and regulatory reporting.” Ex. 1007, p. 6. The IS-B tool can be integrated into SAP’s existing R/3 enterprise application, which includes “client/server architecture, relational databases and graphical user interface.” *Id.*, p. 6; p. 19.

D. Kimball (Ex. 1010)

Kimball is an article describing how to calculate risk-adjusted return of equity (“ROE”) as a performance measure for banks and individual business lines. Ex. 1010, p. 17. Kimball discusses several methods (e.g., regulatory, market based, or risk driven) for allocating capital to each line of business. *Id.*, p. 21.

V. The File History Overlooked by Petitioner

The ‘316 patent issued from US 13/017,952 [Ex. 1002], which was a continuation of application No. 12/401,101 (now the ‘137 patent), which was a

division of 11/354,798 (now the ‘521 patent), which was a continuation of abandoned application No. 09/545,628.

Petitioner offers the file history of parent application 09/545,628 (See Ex. 1015) and acknowledges Mr. Lepman made statements during prosecution of the ‘628 parent application relevant to subject matter of the claims being challenged here. Paper 1, pp. 5, 33 (citing Ex. 1015). Patent Owner also relies on the ‘628 parent application file history in this preliminary response.

Petitioner, however, overlooks and does not offer the file history of US 11/354,798 which issued as the ‘521 Patent. Patent Owner marks the ‘521 patent file history as Ex. 2002 and the ‘521 patent as Ex. 2003. The ‘521 patent file history is relevant because it includes multiple office actions, responses and, ultimately, an appeal brief, together with an inventor declaration, that caused the examiner to withdraw the rejections (including a Section 101 rejection) and allow the claims that issued as the ‘521 patent. Ex. 2002, p. 164 – 206, 221 (“applicant's **two separate affidavits** filed April 29, 2009 have been reviewed. The Final Rejection of February 9, 2009 **has been withdrawn**”) (emphasis added).

Claim 1 of the ‘521 patent, subject to the file history offered here as Ex. 2002, recites the same limitation 1[e] recited in the ‘316 patent discussed throughout this petition:

using the relational database management system to

independently calculate at least one marginal value of profit for each object being measured using the established rules as applied to a selected set of prepared information.

Ex. 2003, 30:61-64; Ex. 2001, Appendix B. All claims of the ‘137 patent, and later the ‘316 patent, issued without any office actions. Ex. 1002, pp. 115-117; Ex. 2002, pp. 164 – 206, 221.

VI. Level of Ordinary Skill in the Art

For purposes of this Preliminary Response, Patent Owner takes no position as to the propriety of Petitioner’s proffered level of ordinary skill in the art. If the Board decides to institute, Patent Owner reserves the right to challenge Petitioner’s position in Patent Owner’s Response.

VII. Claim Construction and Discussion of Claim Terms

The broadest reasonable construction (“BRI”) standard applies to this proceeding. Under the BRI standard, “words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.” *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2146 (2016).

In this Section VII, Patent Owner discusses limitations 1[b] and 1[e] recited in claim 1. In doing so, Patent Owner does not intend to imply that these terms should be construed to depart from their plain meanings. Instead, the discussion below

serves to identify express claim terms Petitioner has effectively ignored or applied in a manner that departs from what the plain meaning dictates.⁶

A. Claim limitation 1[b] “relational database management system”

Portions of Petitioner’s analysis and its expert’s opinions impermissibly conflate “relational database management system” (a/k/a “RDBMS”) with other tiers of system architecture under discussion, such as traditional enterprise software application programs. As a result, Patent Owner respectfully submits a brief discussion of the plain meaning of RDBMS. While the specification does not offer an express definition for the term RDBMS, it assumes familiarity with RDBMS “terminology.” Ex. 1001, 23-14-16. The term RDBMS to a POSITA refers to the

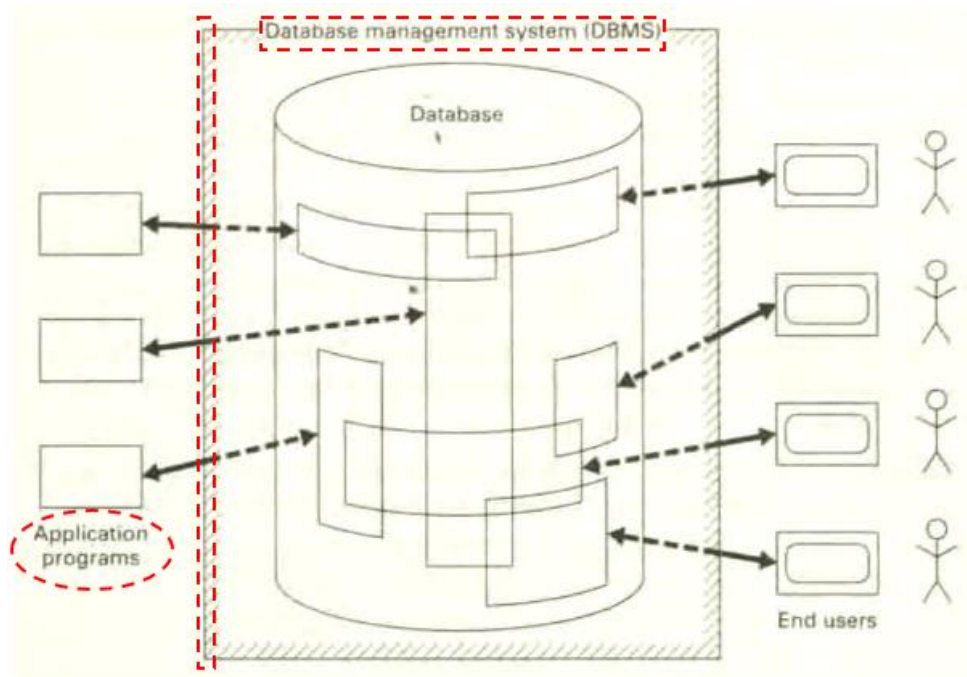
⁶ Similarly, while Petitioner succeeded in filing the present petition one-day in advance of November 13, 2018 – the date the change in claim construction from the BRI to the *Phillips* standard went into effect – the distinction, for purposes of this Preliminary Response, is of no moment. Petitioner does not identify any instances relevant to the present inquiry for which the BRI and *Phillips* constructions differ, nor are there any.

layer of architecture that includes, among other things, the hardware and software responsible for handling access to the files of the database.⁷ Ex. 2001, ¶ 47-52.

Petitioner’s own textbook – *Introduction to Database Systems* 6th ed. – offers the same definition. Ex. 1014, p. 39 (“[t]he database management system (DBMS) is the software that **handles all access to the database**”) (emphasis added).⁸ Significant to analysis of Sections VIII and IX below, enterprise software does not access the files of the database directly, but rather relies on RDBMSs for doing so. Ex. 2001, ¶¶ 49-52. The *Database Systems* textbook Petitioner offers illustrates this point by depicting the DBMS as an *intermediate* layer disposed between the “[A]pplication programs” and “[D]atabase”:

⁷ As Mr. Scarborough explains, a POSITA would have considered the RDBMS to also encompass the underlying database or database files themselves. Ex. 2001, ¶ 56.

⁸ The terms “database management system” (“DBMS”) and “RDBMS” differ only in that the latter adds the “R”– referring to a “relational database management system.” A relational database is a specific type of database. Ex. 2001, ¶ 57.



Ex. 1014, FIG. 1.4 (p. 5) (annotated)

In other words, “applications programs” seeking access to database files must rely on the [R]DBMS for such access. Ex. 2001, ¶¶ 54-55.

RDBMSs typically use a structured query language (SQL) for their database access functions. Ex. 2001, ¶ 50. The embodiment of claim 2, requiring “structured query language (SQL)” for the RDBMS, reflects this distinction. Ex. 1001, 29:12-13; Ex. 2001, ¶ 70, 79.

Finally, while Petitioner does not offer an explicit construction for the term “relational database management system,” some of the opinions of its expert, Bruce Weber, appear to be in agreement:

SAP-IS-B is describing an RDBMS when it describes a database server, hosting a relational database instance, **to**

carry out the functions of accessing the database.

Ex. 1016, ¶ 470 (emphasis added). Despite implicitly agreeing with what RDMBS means, Petitioner and certain of Dr. Weber's discussion of the cited references impermissibly conflate the RDBMS with the software applications that rely on the RDBMS for data access.

B. Claim limitation 1[e] – The RDBMS's Independent Calculations Limitation

Claim limitation 1[e] recites: “using the relational database management system to independently calculate at least one marginal value of profit for each object being measured using the established rules as applied to a selected set of prepared information.” While Petitioner refers to this entire clause as limitation 1[e], Petitioner's discussion is ambiguous because it fails to recognize that limitation 1[e] recites three separate technological features working together to accomplish the resulting performance improvement. Thus, to better clarify, Patent Owner refers to the phrase “using the relational database management system to ... calculate” as limitation 1[e(i)], the phrase “independently calculate” as limitation 1[e(ii)], and the phrase “using the established rules as applied to a selected set of prepared information” as limitation 1[e(iii)].

1. Claim limitation 1[e(i)]: “using the relational database management system to ... calculate”

Petitioner takes no express position on the construction of limitation 1[e(i)] – reciting “using the relational database management system to ... calculate.” Yet, Petitioner’s Section 101 and prior art analysis strips the verb “using” from the claim in its discussion of limitation 1[e], referring back to analysis for limitations 1[a] – 1[d] requiring, among other things, storing information and rules in the RDBMS. *See infra*, Section VIII.A.

Limitation 1[e(i)], however, expressly requires more than that. In particular, limitation 1[e(i)] requires “using” the RDBMS ***itself*** to perform profitability calculations. Ex. 1001, 10:41-46; Ex. 2001, ¶ 71. The plain language recited in claim 1 is clear and beyond dispute. Limitation 1[b] – “providing a relational database management system” – recites the presence of an RDBMS. Limitations 1[c] and 1[d] recite, among other things, preparing information “to be accessed through the [RDBMS]” and establishing rules in the RDBMS. Limitation 1[e] comes next, reciting “using the relational database management system to ... calculate ... using the established rules as applied to a selected set of prepared information.”

To the extent the express claim language “using the [RDBMS] to ... calculate” leaves any doubt, the specification confirms this construction by disclosing that the claimed RDBMS has the “capability to simultaneously support the number of **calculation** permutations required,” while “procedural based software” (typical for application programs) does not:

... DPM's combination of rules and data in a mathematical set theoretic framework . . . **allows for a relational database management system implementation** (42). It is nearly impossible [to] develop and **maintain procedural based software** with as much flexibility and with the **capability** to simultaneously support the number of **calculation** permutations required by DPM.

Ex. 1001, 10:39-46 (emphasis added). This passage of the specification refers to using the RDBMS itself, rather than the “procedural based software” typical of traditional accounting solutions, to perform profitability calculations. *Id.* Ex. 2001, ¶¶ 45-49, 68-71.

Finally, to the extent the plain language of the claim and specification leave any doubt, this construction is confirmed by the prosecution history. In particular, in securing allowance of claim 1 during prosecution of a parent application (i.e. the ‘521 patent file history reciting the same element 1[e] / 1[d] [Ex. 2003, claim 1]), Patent Owner relied on Mr. Lepman’s declaration explaining that the invention requires an “[RDBMS] having ... **calculation capabilities**”:

Claim 2 recites that the relational database comprises structured query language. **The invention requires the use of an electronic relational database management system having** parallel operation and **calculation capabilities**, which can be run using structured query

language. There is no such discussion in Price of a relational database management system or structured query language.

Ex. 2002, p. 119 (emphases added).⁹ *WesternGeco LLC v. ION Geophysical Corp.* 889 F.3d 1308, 1323 (Fed. Cir. 2018) (“A patent's specification, together with its prosecution history, constitutes intrinsic evidence to which the Board gives priority when it construes claims”). In response, the examiner withdrew his rejection and allowed all claims in the application that issued into the ‘521 patent with no further amendment. Ex. 2002, pp. 164 – 206, 221. A similar claim reciting precisely the same “using the [RDBMS] to ... calculate” limitation 1[e] was found allowable and issued in the ‘316 patent without rejection. Ex. 1002, pp. 115-117.

As explained in Section VIII below, using the RDBMS (rather than conventional application software) to perform profitability calculations, as disclosed and claimed, provides improved computational efficiencies not disclosed in the references offered by Petitioner. Ex. 2001, ¶¶ 68-71.

⁹ While Mr. Lepman authored this paragraph in relation to dependent claim 2, rather than claim 1, this paragraph nevertheless confirms the meaning of “using the [RDBMS] to ... calculate” phrase in claim 1. Claim 2 simply requires an SQL-based RDBMS performing the calculations. Ex. 2001, ¶ 79.

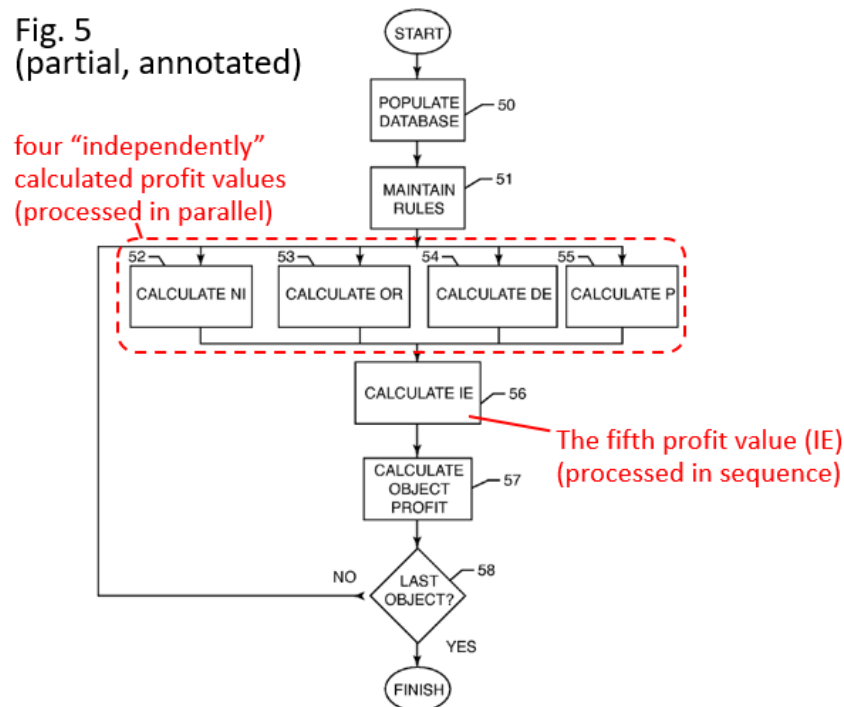
2. Claim limitation 1[e(ii)]: “independently calculate”

While the phrase “independently calculate” also appears in the same limitation 1[e(i)] discussed above -- “using the relational database management system to independently calculate at least one marginal value of profit” -- the modifier “independently” warrants additional discussion. In particular, the phrase “independently calculate” requires that the RDBMS not only perform profit calculations, but also that the RDBMS perform certain of those marginal profit value calculations “independently” of each other, where one calculation does not *depend* on the result of another.¹⁰ Ex. 2001, ¶¶ 81-85.

The ‘316 patent specification illustrates the point. Mr. Lepman arranged his method and calculations in a manner that enables the first four values (NI, OR, DE and P) to be calculated “*independently*” of each other – thereby making it possible for the RDBMS to process multiple profit value calculations in parallel –rather than *dependently*, where calculations depending on prior calculations would execute in sequence. Ex. 1001, 11:35-41, Fig. 5.

¹⁰ Petitioner also frequently ignores that the marginal profit value calculations are “for each object being measured” as recited in limitation 1[e(ii)]: *See infra* Section IX.C.2.

Fig. 5 provides one example, illustrating that NI, OR, DE and P are calculated “independently” of each other (thereby taking advantage of parallel processing) while IE (depending on the results of the prior calculations) is calculated in sequence:



Ex. 1001, FIG. 5 (excerpted and annotated)

Steps 3, 4, 5, and 6 [referring to the NI, OR, DE and P calculations] can be processed **independently**; step 7 requires values derived in step 3, 4, 5, and 6 and therefore occurs **sequentially**.

Id., 11:35-41 (emphasis added);

In sum [sic] implementations this calculation is **dependent** on object level calculations and therefore

processed sequentially (e.g. ratios 3 & 6 below). Otherwise, when the IE rules are **independent** of object level calculations IE can be processed **in parallel** with the other profit calculations (e.g. ratios 1, 2, 4, 5, & 7).

Ex. 1001, 19:55-61.

To the extent the plain language of the claim and specification leave any doubt, the prosecution history confirms the meaning of the “independently” modifier once again. In particular, in securing allowance of claim 1 in a parent application (i.e. the ‘521 patent file history), Patent Owner relied on Mr. Lepman’s declaration explaining the meaning of “independently calculate”:

Independent claim 1 also recites the step of **independently calculating** at least one marginal value of profit for each object being measured using the established rules as applied to a selected set of prepared information. **The invention allows for four of the five factors to be processed in parallel** by a relational database management system (RDBMS) using formulas using selected object level data directly. Price teaches a **sequential process**, first classification and then aggregation, calculations are additions, without subsets. Thus, Price does not teach of using established rules applied to a selected set of prepared information **to independently calculate** at least one marginal value of profit for each object being measured.

Ex. 2002, pp. 118-19 (emphases added);

The invention requires the use of an electronic relational database management system having **parallel operation and calculation capabilities**, which can be run using structured query language.

Id., p. 119 (emphasis added). *Blue Belt Technologies, Inc., v. All-Of-Innovation Gmbh*, IPR2015-00765 Paper 10, 2015 WL 4658616 (PTAB August 3, 2015) (citing *Microsoft Corp. v. Proxyconn, Inc.*, 2015 WL 3747257, at *3 (Fed. Cir. June 16, 2015) (“claims are read in light of the specification and ‘prosecution history in proceedings in which the patent has been brought back to the agency for a second review’”)).

As explained in Section VIII.B, devising at the time of the invention, using independent, rather than dependent, calculations made it possible to process certain profitability calculations in parallel (as recited in claim 1), which reduced the time needed to perform the same number of calculations. Ex. 1015, p. 412 (“I have implemented the invention within a relational database, which has not been done before and allows the information to be analyzed in hours instead of days for a major Bank using **parallel calculations processes.**”); Ex. 2001, ¶¶ 75, 84-85.

* * * *

All told, and in view of Petitioner’s failing to offer any analysis to the contrary, there should be no dispute the plain meaning of claim 1 incorporates at least the following technical features summarized in the chart below:

Claim 1 limitation	Plain Meaning
Claim 1[b] “relational database management system” (RDBMS)	the layer of architecture that includes software and hardware responsible for handling access to the files of the database
Claim 1[e(i)] “using the relational database management system to ... calculate”	using the RDBMS itself to perform profitability calculations (rather than traditional software)
Claim 1[e(ii)] “using the relational database management system to <u>independently</u> calculate”	the RDBMS performs certain profit value calculations “independently” of each other, whereas one calculation does not depend on the result of another.

Additional technical features incorporated in claim 1 will be discussed in Section VIII.A below.

C. Construction Proposed By Petitioner

Petitioner contends the term “profit information” refers to “financial and/or non-financial data related to calculating profit.” Paper 1, p. 16. Patent Owner takes

no position as to the propriety of this construction for purposes of this Preliminary Response. Patent Owner reserves the right to respond to this construction or propose an alternative construction in Patent Owner's response should the Board order institution. The petition offers no other constructions.

VIII. The '316 patent Should Not Be Subjected To a Covered Business Method Review Because it is Directed to a Technological Invention

CBM review is unavailable for patents that are "for technological inventions." AIA § (d)(1); 37 C.F.R. § 42.301(a). The Board employs a two-prong test to determine whether a patent recites a "technological invention": (a) "whether the claimed subject matter as a whole recites a technological feature that is novel and unobvious over the prior art; and [(b)] solves a technical problem using a technical solution." 37 C.F.R. § 42.301(b).

Petitioner bears the burden to show that the challenged patent is subject to CBM review. *See* 37 C.F.R. § 42.304(a) ("The petitioner must demonstrate that the patent for which review is sought is a covered business method patent"); *E*Trade Fin. Corp. v. 18 Droplets, Inc.*, CBM2014-00123, Paper 15 at 5-6 (PTAB Oct. 30, 2014) ("mak[ing] unsupported, conclusory statements...[is] insufficient to demonstrate that the claimed subject matter is not a technological invention"); *Experian Mktg. Sol'ns, Inc. v. RPost Commc'ns Ltd.*, CBM2014-00010, Paper 20 at 9 (PTAB Apr. 22, 2014) ("Petitioner's conclusory language in the petition that none

of the steps of a claim requires any novel and unobvious technological implementation, or solves a technical problem, without more, is not sufficient to demonstrate that the claimed subject matter is not a technical invention”).

For the reasons set forth below, the ‘316 patent falls within the “technological invention” exception to CBM eligibility, and the Petition should be denied as a result.

A. The Claimed Subject Matter as a Whole Recites Technological Features That Are Novel and Unobvious

First, Petitioner asserts, in a conclusory way, that the claimed subject matter as a whole in the ‘316 patent is not “novel and unobvious over the prior art.” 37 C.F.R. § 42.301(b). Petitioner contends that “the claimed database features [of the ‘316 patent] are well-known and established technologies.” Paper 1, p. 6. Petitioner continues by explaining that “databases” are an example of “known technologies” that typically “do not render a patent a technological invention.” *Id.* (quoting 77 Fed. Reg. 48,756, 48,763-64 (Aug. 14, 2012)). As discussed above, limitation 1[e(i)] of the ‘316 patent requires more than the mere presence of a database or RDBMS: the express words recited in this limitation require “using” the relational database management system *itself* to perform marginal profit value calculations. *See supra* Section VII.B.1.

Incredibly, Petitioner has altogether failed to acknowledge that limitation 1[e(i)] – reciting “using the [RDBMS] ... to calculate” – even exists. The Petition’s discussion of limitation 1[e] appearing on page 32 is representative. There, Petitioner asserts:

Element 1[e] recites the generic technology of an RDBMS to “independently calculate” at least one “marginal value of profit” (“MVP”) using the rules. Ex [1016] ¶¶ 143-146.

Paper 1, p. 32. Notably, Petitioner *conveniently* drops the verb “using” from the claim 1, as if element 1[e] required only the mere presence of an RDBMS, rather than reciting “**using** the [RDBMS] ... to calculate.” *Id.*

Next, Petitioner cites to paragraphs 143 - 146 of the Weber declaration. *Id.* Among those seven paragraphs from 143 - 146, an RDBMS is mentioned only in paragraph 143, which reads:

Claim element 1[e] recites the generic technology, discussed previously, of an RDBMS to “independently calculate” at least one “marginal value of profit” using the established rules. As discussed in claim elements 1[b-d], using an RDBMS does not constitute an inventive concept.
Supra VII.A.1(iii)-VII.A.1(v)

Like Petitioner, Dr. Weber fails to acknowledge limitation 1[e] requires “**using** the [RDBMS] ... **to calculate**” – i.e. limitation 1[e(i)] – deferring instead to the “elements 1[b-d]” which do not recite the same requirements.

Further discussion of Petitioner's failures with regard to limitation 1[e(i)] in relation to each cited reference is provided below. *See infra*, Sections IX.B.1, IX.C.1, & IX.D.1; Section III.B.1 (discussing technical limitations of the prior art). As explained in those sections, having glossed over the requirements of limitation 1[e(i)], Petitioner likewise fails to establish this reference is discussed in the cited references. *See id.* As set forth in Section IX, claim limitation 1[e(i)] is but one of several limitations for which Petitioner has failed to establish anticipation by, or obviousness over, any of the cited references. Accordingly, the claimed subject matter recites technological features that are novel and unobvious.

Moreover, by focusing only on individual claim elements, Petitioner fails to address "the claimed subject matter **as a whole**." 37 C.F.R. § 42.301(b) (emphasis added). As discussed in greater detail below, the specific and unique combination of elements constituting the claimed subject matter as a whole directly contributes to the technological features of the claims that the Examiner found to be novel and nonobvious. *See supra*, Section V. Nowhere does Petitioner ever address the significance of the claimed invention as a whole, as it is required to do. *See e.g.* Paper 1, p. 25 – 35. This failure warrants denial of the Petition. *See, e.g., Bloomberg L.P. & Charles Schwab & Co., Inc. v. Quest Licensing Corp.*, CBM2014-00205, Paper 16 at 9 (PTAB April 7, 2015) (denying CBM petition where "Petitioner failed to assess the claims as a whole as required by 37 C.F.R. § 42.301 and has instead

focused on certain individual elements”); *Experian Mktg. Sol’ns, Inc.*, CBM2014-00010, Paper 20 at 7-9, (PTAB Apr. 22, 2014) (Petitioner incorrectly focused on only a few claim limitations rather than addressing the claimed server configuration as a whole).

B. The ‘316 patent Solves a Technical Problem Using a Technical Solution

The claimed subject matter also provides technical solutions to solve technical problems and is therefore a technical invention. With respect to this second prong, Petitioner makes a conclusory assertion that “[n]othing in the claims recites a technological solution” but fails to address what the claims actually recite. *See* Paper 1, p. 7; *E*Trade Fin. Corp. v. 18 Droplets, Inc.*, CBM2014-00123, Paper 15 at 5-6 (PTAB Oct. 30, 2014) (“mak[ing] unsupported, conclusory statements...[is] insufficient to demonstrate that the claimed subject matter is not a technological invention”).

Petitioner also misleadingly mischaracterizes the technical problem and solution to which the ‘316 patent is directed. Contrary to Petitioner’s assertions, the problem addressed by the ‘316 patent is not merely “[c]alculating profit using a general ledger.” Paper 1, p. 7. Among the various technical problems and solutions disclosed and claimed in the ‘316 patent (*see supra* Section VIII.B) is to use the RDBMS itself to perform profitability calculations, which results in significantly

improved performance relative to procedural based software. *See supra* Section VIII.B. Indeed, the ‘316 patent teaches that “[i]t is nearly impossible [to] develop and maintain procedural based software with as much flexibility and with the capability [as using the RDBMS itself] to simultaneously support the number of calculation permutations required.” Ex. 1001, 10:43-47.

As detailed in Section VII.A.2.b, limitation 1[e(ii)] – “independently calculate” – claims yet another specific way for the computer to achieve greater speed and efficiency in calculating profitability. *See also* Ex. 2001, ¶¶ 75, 81-85. Claim 1 requires applying profit calculations specifically designed to be “independent” of each other, rather than dependent. As the specification explains, applying independent calculations, as claimed, permits the method to take “advantage of technological advances in massively parallel computing capability.” Ex. 1001, 2:11-12.

Petitioner ignores the Federal Circuit’s repeated guidance that software can serve as a technological solution. *See, e.g., Enfish*, 822 F.3d at 1335 (“[s]oftware can make...improvements to computer technology just as hardware improvements can”); *Finjan, Inc. v. Blue Coat Systems, Inc.*, 879 F.3d 1299, 1304 (Fed. Cir. 2018) (“[o]ur cases confirm that software-based innovations can make ‘non-abstract improvements to computer technology’”); *see also* 157 Con. Rec. S5402 (daily ed. September 8, 2011) (statement of Sen Kyl) (regarding AIA § 18, “I...reiterate that

technological inventions are excluded from the scope of the program, and that these technological inventions include inventions in...computer operations—and that inventions in computer operations obviously include software inventions”).

* * * *

All told, Petitioner’s silence on the technologies recited in the claims, such as in limitations 1[e(i)] and 1[e(ii)] limitations, means that Petitioner has failed to meet its burden of establishing eligibility for CBM review of patent owner’s technical innovation, and institution should be denied for that reason.

IX. Petitioner Has Not Met Its Burden in Connection With Grounds 1 - 11

To the extent the Board finds the ‘316 patent CBM eligible, the Board should nevertheless deny institution because Petitioner has failed to meet its burden of showing the challenged claims are “more likely than not” unpatentable. See 35 U.S.C. § 324(a).

A. Ground 1: Petitioner Fails to Establish That Claims 1, 3, and 8-24 are Directed to Ineligible Subject Matter

Ground 1 depends on the two-step analysis applied in *Alice*, 134 S. Ct. 2347. In the first step, the Board must determine whether the claims at issue are directed to a patent-ineligible abstract concept. *Id.* at 2355. If the first step is met, the Board must “consider[] the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of

the claim’ into a patent-eligible application.” *Id.* Petitioner fails to meet its burden for both steps.¹¹

1. *Alice* Step One: The Claims Are Not Directed to an Abstract Idea

Petitioner’s *Alice* step one analysis fails because it impermissibly strips key claim limitations critical to the inquiry. Petitioner contends claim 1 is merely directed to the abstract idea of “calculating object level profitability.” Paper 1, p. 18. Petitioner continues by asserting that claim 1 simply contemplates “calculating object level profitability, as recited by the claims, is simply calculating a first value (opportunity value), calculating one or more second values (a marginal value of profit), and combining the one or more second values (the first value sits idle); that is it – the epitome of pen-and-paper activity.” Paper 1, p. 18. Yet, Petitioner’s *Alice* step one analysis altogether ignores important limitations, such as:

¹¹ Even if Petitioner were to prevail on the “technical solution” and CBM eligibility inquiry, that is not dispositive of the *Alice* analysis. There are Board decisions that have found patents CBM eligible but have denied institution on *Alice* grounds. *See, e.g., Yahoo! Inc. v. AlmondNet, Inc.*, CBM2017-00046, Paper 8 (PTAB Oct. 16, 2017).

- Claim 1[e(i)] “using the relational database management system to ... calculate” – a particularized and unconventional use of an RDBMS’s calculation capabilities, which reduced the processing time a procedural-based software application would need to complete the same number of calculations, see e.g. Ex. 2001, ¶ 97;
- Claim 1[e(ii)] “independently calculate” – making it possible for the RDBMS to process separate profit values for the same object in parallel, which reduced the processing time even further, see e.g. Ex. 2001, ¶ 98; and
- Claim 1[e(iii)] “independently calculate ... for each object being measured using the established rules as applied to a selected set of prepared information” – reciting a specific way for the RDBMS calculation and “independently calculate” features of 1[e(i)] and 1[e(ii)] to be carried out, see e.g. Ex. 2001, ¶ 100.

As detailed below, Petitioner’s silence on limitations 1[e(i)], 1[e(ii)] and 1[e(iii)] should alone be fatal to Ground 1. *See, e.g., Yahoo! Inc. v. AlmondNet, Inc.*, CBM2017-00046, Paper 8 (PTAB Oct. 16, 2017) (“Petitioner has not articulated how any of these concepts are embodied in Petitioner's alleged abstract idea of merely ‘securing revenue from advertising’”). Even if addressed by Petitioner, these limitations make Claim 1 non-abstract for reciting a “specific implementation of a

solution to a problem in the software arts.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339 (Fed. Cir. 2016); *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1348 (Fed. Cir. 2018), as amended (Nov. 20, 2018) (finding non-abstract a “specific technique that departs from earlier approaches to solve a specific computer problem”).

**a. Binding Precedent and Patent Office Guidance
Prohibit Ignoring Claim Limitations**

Federal Circuit precedent expressly prohibits ignoring recited claim limitations, as Petitioner here attempts to do. *Enfish*, 822 F.3d at 1337 (Fed. Cir. 2016) (“Describing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule”). “Whether at step one or step two of the *Alice* test, ... a court must look to the claims as an ordered combination, **without ignoring the requirements of the individual steps.**” *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016) (emphasis added).

The Patent Office’s 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) (the “Eligibility Guidance”) is consistent with this point. For *Alice* step one, the eligibility guidance requires considering not only the claim elements alleged to be an abstract idea – in this case “calculating object level profitability” as Petitioner asserts – but also “any additional elements” beyond that:

[e]valuate ... by: (a) identifying whether there are any **additional elements** recited in the claim beyond the judicial exception(s); and (b) evaluating those **additional elements** individually and in combination to determine whether they integrate the exception into a practical application

2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) (emphases added). In this case, those “additional elements ... beyond the judicial exception,” ignored by Petitioner, include, among others, limitations 1[e(i)], 1[e(ii)], and 1[e(iii)]. This is fatal to Ground 1. *See Crane Merchandising Systems, Inc., v. NewZoom, Inc.*, CBM2017-00054, Paper 13 at 6 (PTAB February 19, 2019) (“Mere conclusory statements that do not address the claimed invention as a whole are insufficient to satisfy Petitioner’s burden”).

b. Limitations 1[e(i)], 1[e(ii)] and 1[e(iii)] Recite a Specific Implementation of a Solution to a Problem in the Software Arts

Petitioner’s silence concerning these claim limitations is hardly surprising. Confronted directly, there is little doubt the limitations recite specific steps that permit the computerized profitability method to perform with greater speed and efficiency – a practical application and “specific implementation of a solution to a problem in the software arts” that survives eligibility scrutiny under *Alice* step one. Ex. 2001, ¶¶ 97-100. *Enfish*, 822 F.3d at 1339. “Computers are improved not only

through changes in hardware; “[s]oftware can make non-abstract improvements to computer technology” *Ancora Techs., Inc.*, 908 F.3d at 1347 (quoting *Enfish*, 822 F.3d at 1335)).

For example, the Federal Circuit found the claims of *Finjan Inc. v. Blue Coat Systems, Inc.*, 879 F.3d 1299 (Fed. Cir. 2018) non-abstract under *Alice* step one for reciting an improved method of virus filtering. While the idea of computer virus filtering was already known, the claimed software methods recited a “more flexible and nuanced virus filtering,” which the court found “a non-abstract improvement in computer functionality, rather than the abstract idea of computer security writ large.” *Id.* at 1304. Similarly, *Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc.* 880 F.3d 1356, 1363 (Fed. Cir. 2018) found claims directed to a method for making websites easier to navigate on a small-screen device to be non-abstract. While the claims recited generic computer concepts, such as indexing information, the claims were nevertheless directed to a specific type of index for a specific type of user. *Id.* at 1362-63. As detailed below, limitations 1[e(i)], 1[e(ii)] and 1[e(iii)] – ignored in Petitioner’s *Alice* step one analysis – similarly recite specific, non-abstract improvements to prior attempts to calculate object level profitability by making the computerized profit calculator faster and more efficient.

(i) **Limitation 1[e(i)] reciting “using the [RDBMS]**

to ... calculate” makes claim 1 non-abstract

Limitation 1[e(i)] – “using the [RDBMS] to ... calculate” – claims a specific way for the computer to achieve greater speed and efficiency in calculating profitability. One approach Mr. Lepman employed to overcome the “technical difficulty of providing daily profit data in large-scale organizations” involved using the RDBMS to, not only manage access to the data, but to also perform the profitability calculations themselves. Ex. 2002, p. 117. Doing so results in significantly improved performance, compared to methods relying largely on traditional procedural-based software:

This approach allows for a relational database management system implementation (42). It is nearly impossible [to] develop and **maintain procedural based software** with as much flexibility and with the capability to **simultaneously support the number of calculation permutations required.**

Ex. 1001, 10:42-47.

At the time of the invention, most accounting and other enterprise software platforms relied on the RDBMS to, for example, fetch files from the database and handle other data access related tasks. Ex. 2001, ¶¶ 58-65. The task of performing *actual calculations* on that data was usually performed by procedural-based software – typically executing on a separate application server. Ex. 2001, ¶¶ 60-62. For

example, Petitioner’s own SAP-IS-B reference (Ex. 1007) discloses a three-tier architecture and teaches that calculations are performed by an application server. *See supra*, Section IX.D.1; Ex. 1007, p. 19; Ex. 2001, ¶ 62.

Mr. Lepman explained the performance improvements he realized with this improvement in a 2004 inventor declaration to the examiner:

I have implemented the invention **within a relational database**, which has not been done before and allows the information to be analyzed **in hours instead of days** for a major Bank using **parallel calculations processes**.

Ex. 1015, p. 412 (emphasis added).

The idea of relying on the RDBMS to calculate marginal profit values not only differed from the prior art, it also greatly improved the speed and efficiency from which the method can be carried out. Ex. 2001, ¶ 68, 97.

(ii) **Limitation 1(d)(ii) reciting “independently calculate” makes claim 1 non-abstract**

Limitation 1[e(ii)] – “independently calculate” – claims yet another specific way for the computer to achieve greater speed and efficiency in calculating profitability. Claim 1 requires applying profit calculations specifically designed to be “*independent*” of each other rather than *dependent*, where the results of a first calculation must be available before a second calculation (dependent on the first calculation) begins:

Steps 3, 4, 5, and 6 [referring to the NI, OR, DE and P calculations] can be processed **independently**; step 7 requires values derived in step 3, 4, 5, and 6 and therefore occurs **sequentially**.

Id., 11:36-40 (emphases added).

Applying *independent* calculations, as claimed, permits the method to take “advantage of technological advances in massively parallel computing capability” – referring to multi-processor hardware platforms. *Id.*, 2:11-12.

Use of this method is **especially suited for massively parallel computing** technology where linear scaleable capital investment in processing technology is possible vis-a-vis object and event count and rule complexity.

Ex. 1001, 8:37-41 (emphasis added).

As the intrinsic evidence explains, doing so greatly improves the speed and efficiency from which the method can be carried out.

I have implemented the invention **within a relational database**, which has not been done before and allows the information to be analyzed **in hours instead of days** for a major Bank using **parallel calculations processes**.

Ex. 1015, p. 412 (emphasis added). Ex. 2001, ¶ 98.

- (iii) **Limitation 1[d] and 1[e(iii)] reciting “calculate ... using the established rules as applied to a selected set of prepared information” makes claim 1 non-abstract**

Limitations 1[d] and 1[e(iii)] recites a particularized way to carry out the RDBMS calculations and “independently calculate” features of 1[e(i)] and 1[e(ii)]. Section 101 case law overwhelmingly favors claims that recite specific steps for achieving the desired result, as opposed to claims reciting the result alone:

Here, the claims recite more than a mere result. Instead, they recite specific steps—generating a security profile that identifies suspicious code and linking it to a downloadable—that accomplish the desired result.

Finjan, 879 F.3d at 1305.

To facilitate using the RDBMS to perform independent calculations on a massively parallel hardware platform, claim limitation 1[d] recites establishing “rules for processing” into the relational database. Ex. 1001, 31:22-23 (“establishing, in the relational database, rules for processing”). Establishing processing rules in the database differed from incorporating processing rules into traditional procedural code (using, for example, “if-then-else” expressions). Ex. 2002, p. 118; Ex. 2001, ¶ 102.

As the specification explains:

DPM is designed to allow the user the freedom to associate a group of objects with a rule and to use object-level information in combination with rule parameters to calculate profit values.

Ex. 1001, 8:30-33; Ex. 2001, ¶¶ 86-88. Limitation 1[d] further specifies that the “establishing” step includes “the steps of providing the information necessary to select objects, and performing the correct profit calculus.” Ex. 1001, 29:2-4. In other words, rules defining how the objects are selected and how to perform the profitability calculations are written to the database itself alongside the object data (e.g. airline flights, seats) to be processed. Ex. 1001, 8:27-41; Ex. 2001, ¶ 87. The RDBMS can then be used to process the calculations themselves using an SQL command involving “joining relational tables” or the like. Ex. 1015, p. 407; Ex. 2001, ¶ 87.

The language of limitations 1[d] and 1[e(iii)] is a far cry from cases such as *Electric Power Group* – relied on extensively by Petitioner (see, e.g., Paper 1, p. 21) – where the claim failed to recite any steps for “how the desired result is achieved.” *Electric Power Group LLC v. Alstom S.A.*, 830 F.3d 1350, 1355 (Fed. Cir. 2016).

All told, there should be no dispute that the claimed features, conveniently absent from Petitioner’s *Alice* step one analysis, recite a “specific implementation of a solution to a problem in the software arts” that survives eligibility scrutiny under *Alice* step one. *Enfish*, 822 F.3d at 1339. Ex. 2001, ¶ 31, 96.

c. The Case Law Petitioner Relies on For *Alice* Step One is Plainly Distinguishable

Petitioner’s reliance on authority, such as *Alice* and *Bilski*, also illustrates why stripping away claim limitations 1[e(i)], 1[e(ii)] and 1[e(iii)] from *Alice* step one is prohibited. Paper 1, p. 19. Cases such as *Alice* and *Bilski* would arguably be applicable had Patent Owner merely claimed the basic idea of “calculating object level profitability” and stopped there – as Petitioner contends. Paper 1, p. 18. But that is not the situation here. Instead, as detailed above, claim 1 recites specific, non-abstract improvements to prior attempts to calculate profitability at the object level, which take advantage of RDBMS calculation capabilities and parallel processing power in a way that results in a faster and more efficient computerized method.

Similarly, Petitioner relies on *Bancorp Servs. LLC v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266 (Fed. Cir. 2012) in contending the ‘316 patent is merely “directed to solving a business problem, not improving the performance of a database or computer such as by increasing its speed or efficiency.” Paper 1, p. 19. In making this assertion Petitioner completely ignores limitations 1[e(i)], 1[e(ii)] and 1[e(iii)], which, as explained extensively above, are *specifically directed to increasing the speed and efficiency of the computerized profit calculator*. Ex. 2001, ¶¶ 96-100.

d. Claim 1 is Not a Mental Process

Petitioner also contends, incredibly, that “[t]he steps of the Challenged Claims represent a mental process. Paper 1, p. 21. According to Petitioner, “calculating object level profitability for an organization can be calculated by a human on pen and paper.” *Id.* Petitioner is incorrect.

As Mr. Scarborough explains, there may be ways to use a pen and paper to perform an object level profitability calculation, but claim 1 explicitly differs. Ex. 2001, ¶¶ 92-95. There were also “computer software” based attempts at performing object level profitability calculations on a limited scale, as Mr. Lepman explained in the file history:

Based upon my nearly thirty years experience in this field, **although account level profitability has been attempted with limited success using computer software**, object level profitability using a relational database management system **was not in place before my invention** and has many benefits over prior methodologies and systems.

Ex. 1015, p. 408 (emphasis added).

Claim 1 specifically recites *how* object level profitability is calculated in a very particularized way – namely performing “independent[]” profitability calculations within the RDBMS itself using rules written to the database. Ex. 2001, ¶ 95. Limitations 1[e(i)], 1[e(ii)] and 1[e(iii)] explicitly recite these improvements,

which were largely ignored by Petitioner. These improvements made it possible to perform simultaneous RDBMS calculations using massively parallel computing hardware to achieve a faster, more efficient and more scalable profit calculator. *Id.* Contrary to Petitioner’s unsupported assertions, claim 1 does not have a “pen and paper” or “mental process” equivalent. *Id.*

2. Alice Step Two: The Claim Limitations Provide an Inventive Concept

Even assuming *arguendo* that claim 1 and its dependents are directed to an abstract idea, as Petitioner contends, the limitations recited and the ordered combination of them “involve more than performance of well-understood, routine, and conventional activities previously known to the industry.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (citations omitted). The presence of such limitations or ordered combination are commonly referred to as an “inventive concept.” *Id.* at 1367.

In asserting claim 1 recites no inventive concept, Petitioner contends:

Claim 1 recites generic technologies – “database” and a “relational database management system” – that fail to transform the abstract idea into patent-eligible subject matter.

Paper 1, p. 22. Petitioner continues by purporting to identify where each element recited in claim 1 could be found in the prior art. Paper 1, pp. 25-32. There are two

fundamental problems with Petitioner’s *Alice* step two analysis, and each is dispositive.

a. Problem 1: Petitioner Fails to Establish Certain Individual Limitations Were Known

First, nowhere has Petitioner established individual limitations – such as 1[e(i)] “using the [RDBMS] to ... calculate” and 1[e(ii)] “independently calculate” – were known, let alone “well-understood, routine, and conventional.” *Berkheimer*, 881 F.3d at 1369 (“the mere fact that something is disclosed in a piece of prior art, for example, does not mean it was well-understood, routine, and convention”). For limitation 1[e(i)] “using the [RDBMS] to ... calculate,” Petitioner offers absolutely no evidence other than asserting, in a conclusory way, limitation 1[e] as a whole recites “generic technologies.” Paper 1, p. 32. As detailed in Section VII.B.1 above, limitation 1[e(i)] claims a particularized and unconventional use of RDBMS capabilities, not simply the mere presence of an RDBMS. Petitioner is entirely silent about the claimed use of these RDBMS capabilities.

For limitation 1[e(ii)], Petitioner turns to SAP-IS-B (Ex. 1007) as purportedly disclosing “independently calculating marginal values of profit.” However, that analysis also falls well short of the mark. *See infra*, Section IX.C.2. Thus, Petitioner’s *Alice* step two analysis fails for failing to establish that even individual limitations were known, let alone well-understood, routine and conventional.

b. Problem 2: Petitioner Fails to Address the Claimed Ordered Combination

Even if Petitioner established individual limitations were known, which Petitioner has not done, its *Alice* step two analysis nevertheless altogether ignores the limitations, as claimed, in an ordered combination. *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016) turned on this issue. The *Bascom* court expressly acknowledged “the limitations of the claims, taken individually, recite generic computer, network and Internet components, none of which is inventive by itself.” *Id.* at 1349. Nonetheless, *Bascom* held an “inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces.” *Bascom* continues by explaining where the inventive concept could be found:

The inventive concept described and claimed in the '606 patent is the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user. This design gives the filtering tool both the benefits of a filter on a local computer and the benefits of a filter on the ISP server.

Id. at 1350.

In the instant case, each claim element operates together to achieve a particularized profitability calculator that takes advantage of RDBMS capabilities, parallel processing and rules and data to achieve a solution capable of processing

more object-level profitability calculations than its predecessors in the same amount of time. Ex. 2001, ¶¶ 97-99. Turning to limitation 1[d], “establishing, in the relational database, rules for processing the prepared information,” the claimed method specifically requires that the database itself store the rules, rather than expressing the same in procedural code (using, for example, “if-then-else” expressions). Ex. 2002, p. 118; Ex. 2001, ¶ 102. In overcoming a rejection during prosecution, Mr. Lepman explained the benefit of establishing rules in this manner:

This is a computer formula for use in a non-iterative and standard actuarial formula along with dynamic data in an RDBMS calculation. In Price, the debit and credit classifications are part of the prepared information itself, not the calculation thereof. Price's rules do not lend themselves into **RDBMS rules, since they are procedural in nature, i.e., use if-then-else stepwise iterative logic.**

Id. (emphasis added). Claim 1 continues with limitation 1[e] (inclusive of 1[e(i)], 1[e(ii)], and 1[e(iii)]), which combines the rules “in the relational database” concept of 1[e] with the particulars of the calculation engine contemplated:

using the relational database management system to independently calculate at least one marginal value of profit for each object being measured using the established rules as applied to a selected set of prepared information,

Ex. 1001, 29:5-9. As discussed in Section VII.A above, the recited claim language incorporates an unconventional combination of at least three concepts associated with the desired result:

- (1) the RDBMS itself performs the profitability calculations – i.e., limitation 1[e(i)] – which provides speed and efficiency, see Ex. 2001, ¶ 71, 97, 100, 102;
- (2) the calculations execute “independently” of each other – i.e., limitation 1[e(ii)] – to take advantage of parallel processing capabilities, which further provides speed and efficiency, see Ex. 2001, ¶ 85, 98, 100, 102; and
- (3) established rules as applied to a selected set of prepared information are used to perform the calculations – i.e., limitation 1[e(iii)], see Ex. 2001, ¶ 91, 100, 102.

* * * *

Thus, even assuming claim 1 and its dependents are directed to an abstract idea, the limitations recited and the ordered combination of them undoubtedly claim an inventive step dispositive of Ground 1. Ex. 2001, ¶ 32, 102.

3. Ground 1 Also Fails for All Dependent Claims

Claim 1 is the only independent claim in the ‘316 patent. Thus, the deficiencies discussed above with respect to claim 1 also apply to all dependent

claims. Patent Owner reserves the right to raise additional challenges to Ground 1 for these dependent claims should the Board decide to institute.

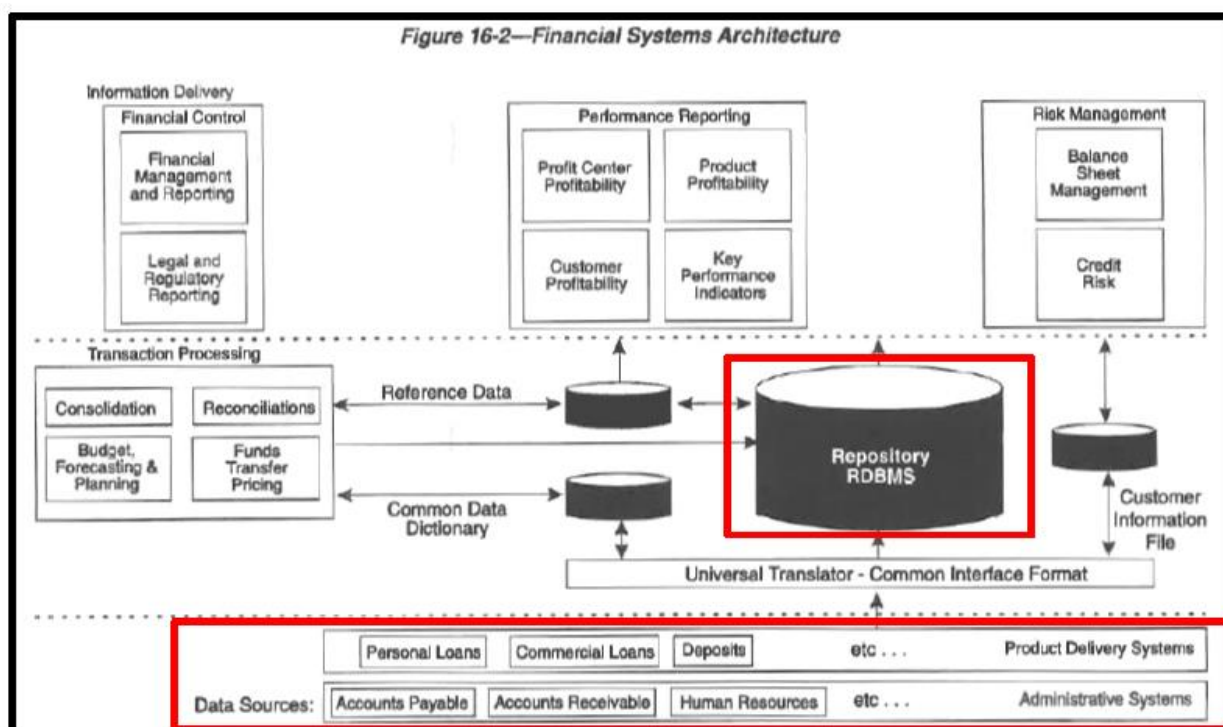
B. Grounds 2-3: Petitioner Fails to Establish Claims 1, 3, 8-24 are Anticipated or Rendered Obvious by E&Y

Petitioner argues that claims 1 and certain dependents are anticipated by E&Y (Ground 2) or rendered obvious by E&Y (Ground 3). *See generally*, Paper 1, pp. 46-81. As set forth below, Petitioner has failed to meet its burden.

1. E&Y fails to disclose or render obvious limitation 1[e(i)]: “using the relational database management system to ... calculate”

As discussed above, claim 1 requires using the RDBMS itself to perform profitability calculations (rather than an application program). *See supra*, Section VII.B.1.

In connection with limitation 1[b], Petitioner alleges that E&Y discloses a “relational database platform” for “aggregating data from many vertical, product-account-based databases.” Paper 1, p. 48 (citing Ex. 1005, p. 277, 288). In particular, Petitioner points to Figure 16-2 of E&Y, reproduced below. *Id.* (citing Ex. 1005, p. 275).



Paper 1, p. 47; Ex. 1005, p. 275 (Petitioner’s annotations)

E&Y might appear to disclose an RDBMS, but Petitioner utterly fails to address limitation 1[e(i)]’s requirement of “using the [RDBMS] to ... calculate.” See *generally*, Paper 1, p. 55-57. That is, even assuming *arguendo* Petitioner is correct that E&Y discloses an RDBMS and “teaches to ‘independently calculate’ a marginal value of profit,” (which it does not), nowhere does Petitioner explain how E&Y discloses, teaches, or suggests using the RDBMS *itself* to perform such calculations as required by the challenged claims.

The closest Petitioner comes to making such an allegation appears in its discussion of claim limitation 1[d], where Petitioner contends: “E&Y discloses using relational databases, establishing rules in the relational database, using the database

to process information, and calculating profit at a granular level.” Paper 1, pp. 51 (citing Ex. 1005, 239, 268-269; 320; Ex. 1016, ¶¶ 262-264). However, none of these cited page numbers in E&Y say anything about an RDBMS or database, let alone using the RDBMS *itself* to perform marginal profit value calculations for each object being measured, as required by limitation 1[e(i)].

Accordingly, Petitioner has failed to meet its burden in connection with Ground 2. *See, e.g., Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (“[A] prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim’”); *Tristar Products, Inc. v. Choon’s Design, LLC*, IPR2015-01883, Paper 16 at 8 (Mar. 7, 2017) (“In an IPR, the petitioner has the burden from the onset to show with particularity” why claims are anticipated). Petitioner does not offer any obviousness analysis for limitation 1[e(i)] under Ground 3. Thus, Petitioner has failed to meet its burden in connection with Ground 3 as well.

**2. E&Y fails to disclose or render obvious limitation 1[e(ii)]:
“independently calculate ... for each object”**

As discussed above, the limitation 1[e(ii)] phrase “independently calculate” requires that the RDBMS performs marginal profit value calculations “independently,” i.e., such that one marginal profit value calculation does not

depend on the result of another. *See supra* Section VII.B.2. Claim 1 also specifies that marginal profit value calculation(s) are “for each object being measured.” Petitioner has failed to show that E&Y discloses or renders obvious marginal profit value calculations that are (1) independent and (2) for each object being measured.

To try to manufacture a disclosure of limitation 1[e(ii)] in E&Y, Petitioner cherry-picks unrelated aspects of different accounting methodologies. Petitioner maps E&Y’s discussion of an activity based costing (ABC) method and its “cost object” to the claimed “object.” *See* Paper 1, pp. 56-57. E&Y explains that “cost objects” are “any product service, customer, market distribution channel, project, etc., for which a unique cost measurement is desired.” Ex. 1005, pp. 125-26. E&Y differentiates “cost objects” from “cost pools.” In this approach, “process/activity cost pools” include “the costs of the institution’s resources (e.g., salaries, equipment, capital).” *Id.*, p. 126. Then, the cost pools “are assigned to cost objects, based on a cost object’s use or consumption of an activity.” *Id.* E&Y’s discussion of the ABC method is found in Chapter 8. *See id.*, p. 123.

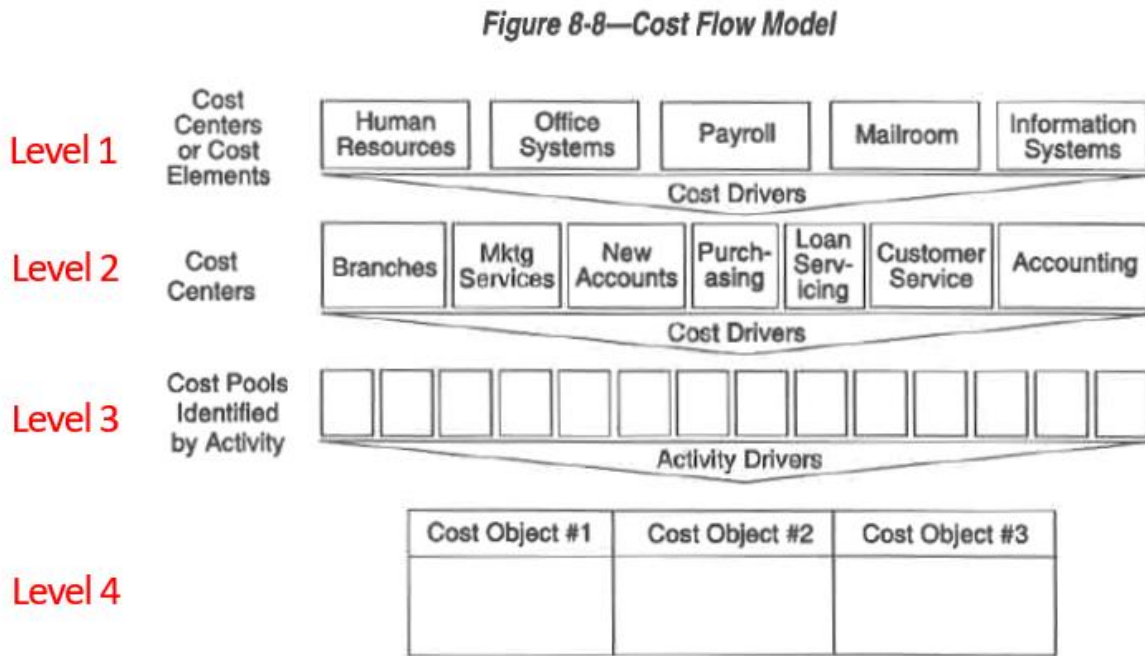
Yet for the “independently calculate” limitation, Petitioner points to E&Y’s discussion of a “direct allocation approach” found in Chapter 7. *See* Paper 1, p. 55 (quoting Ex. 1005, p. 104); Ex. 1005, p. iv (Table of Contents). The direct allocation approach discussed on page 104 of E&Y is one of many different “Cost Accounting Approaches and Methodologies.” *See, e.g., id.*, p. 103 (“Cost Transfer

Approaches”); p. 107 (“Sequential Allocation Approach”); p. 111 (“Simultaneous Allocation Approach”). In the E&Y direct allocation approach Petitioner relies on, expenses (e.g., human resource expenses) are directly allocated to the ultimate beneficiaries (e.g., a lending office and a branch). *Id.*, p. 104.

Petitioner does not explain how the ABC method (applied for “each object being measured”) relates to the direct allocation approach (applied for “independently calculate”). This failure alone means that E&Y is not anticipatory. *See, e.g., Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (a reference “must not only disclose all limitations of the claim within the four corners of the document, but must also disclose those limitations ‘arranged as in the claim’” to anticipate). Moreover, Petitioner does not provide an argument, let alone a rationale underpinning it, as to why a person skilled in the art would have been motivated to combine these teachings to arrive at the claimed subject matter.

Further, even assuming *arguendo* that the direct allocation approach teaches to “independently calculate,” the results are not tied to the purported “cost objects” described in the ABC method. The direct allocation approach provides an example where \$150,000 in human resource expenses are allocated in the aggregate between a lending office and a branch based on their relative number of employees. Ex. 1005, pp. 104-105. This corresponds to the “cost pools” discussed in the ABC method, but not to the “cost objects.” *See id.*, p. 126. Indeed, Figure 8-8, which is directed to the

ABC method, confirms visually that allocating human resource expenses to a branch is a “cost pool,” not a “cost object.”



Ex. 1005, Fig. 8-8 (p. 138) (annotated)

That is, directly allocating human resource expenses to a branch occurs in level 2 (the purported “independently calculat[ing]”), whereas the cost objects appear in level 4 (the purported “objects being measured”).

In short, Petitioner has effectively ignored limitation 1[e(i)] and cherry-picked unrelated aspects of different accounting methodologies in E&Y in its effort to manufacture a disclosure of limitation 1[e(ii)]. Even if E&Y’s direct allocation approach teaches to “independently calculate,” E&Y fails to disclose, teach, or

suggest “independently calculat[ing] at least one marginal value of profit **for each object being measured**” as recited in claim 1. Petitioner does not offer any obviousness analysis for limitation 1[e(ii)] under Ground 3. Accordingly, Petitioner has failed to meet its burden to show that E&Y discloses or renders obvious the limitations of claim 1.

C. Grounds 4-5: Petitioner Fails to Establish Claim 1 is Anticipated or Rendered Obvious by Blain

Petitioner next argues that claim 1 is anticipated by Blain (Ground 4) or rendered obvious by Blain (Ground 5). *See generally*, Paper 1, pp. 82-89. As set forth below, Petitioner has failed to meet its burden.

**1. Blain fails to disclose or render obvious limitation 1[e(i)]:
“using the relational database management system to ...
calculate”**

As discussed above, claim 1 recites using the RDBMS itself to perform profitability calculations (rather than an application program). *See supra* Section VII.B.1.

Patent Owner acknowledges that Blain discloses an RDBMS database. Ex. 1006, pp. 36-37; Paper 1, pp. 82-83. However, once again, Petitioner fails to address the requirement of using the RDBMS *itself* to calculate marginal profit values. Petitioner’s entire discussion of Blain (appearing on pages 31-33, and then again on 82-89) does not even acknowledge this limitation exists. Petitioner merely alleges

that “Blain discloses using rules, established in a relational database, to perform profit calculations.” Paper 1, p. 87. Specifically, Petitioner cites pages 207, 217, and 304-313 of Blain. *Id.* However, *none* of these cited pages discloses, teaches, or suggests using the RDBMS itself to perform any type of calculation whatsoever. Grounds 4 - 5 should be denied based on this deficiency alone.

If anything, Blain suggests that calculations are not performed by the RDBMS, but instead by an application server. Blain is directed to the SAP-R/3 enterprise product, which according to Petitioner’s expert, “was being used globally across many industries” at the time of the invention. Ex. 1016, ¶ 91. Blain explains that the R/3 software has three main components: databases to retain information, applications for processing data, and presentation services. Ex. 1006, pp. 40-41. Figure 3-1 illustrates a three-tier system including separate front end servers, application servers, and database servers. *Id.*

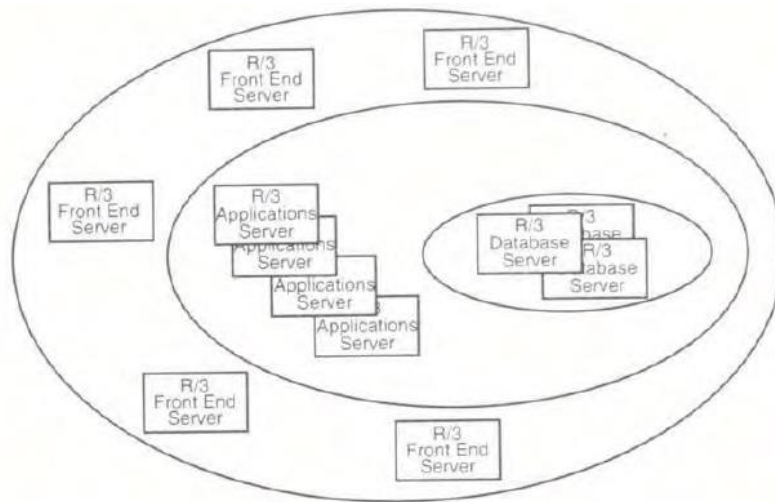


Fig. 3.1 Triple client server configuration.

Ex. 1006, Fig 3.1 (p. 42)

Blain states that the application servers “control the logic of business transactions.” *Id.*, p. 45. To use the applications, a “user logs on, calls upon a series of transactions, and then logs off again.” *Id.*, p. 47. Each application server performs a number of work processes, including “[i]nteractive dialog processing” and can communicate with the database and front end servers of the R/3 system. *Id.* That is, Blain teaches that an application server would apply any processing or calculation steps on data stored in a database server. *Id.* Blain, however, does not disclose, teach, or suggest using the database server *itself* to perform any calculations.

In sum, Petitioner fails to address claim 1’s requirement of “using the relational database management system ... to calculate,” and consequently fails to show that Blain anticipates any of the challenged claims (Ground 4). Indeed, any argument that Blain discloses this limitation would have been futile given that Blain

teaches a multi-tier architecture in which the application server is used for calculations. Petitioner does not offer any obviousness analysis for limitation 1[e(i)] under Ground 5. Thus, Petitioner has failed to meet its burden for Ground 5 as well.

2. Blain fails to disclose limitation 1[e(ii)]: “independently calculate”

As discussed above, the phrase “independently calculate” in limitation 1[e(ii)] requires that the RDBMS perform marginal profit value calculations “independently,” i.e., such that one marginal profit value calculation does not depend on the result of another. *See supra* Section VII.B.2. While Petitioner attempts to bolster its point by citing several sections of Blain, none of these citations discuss independently calculating marginal profit values *for each object being measured*, as claimed.

Initially, Patent Owner acknowledges that Blain uses the word “independent” in Petitioner’s first quotation. Paper 1, p. 87 (citing Ex. 1006, p. 304). This, however, has nothing to do with the claimed marginal profit value calculations. Blain states “[t]he cost object could be an entity which is quite independent of any particular SAP application – a convenient peg to which to hang information relevant to the specific costing procedures of your company.” *Id.* Petitioner attempts to equate Blain’s statement that a cost object can be independent of a SAP application with claim 1’s recitation of independently calculating a marginal profit value. This is a

non-sequitur. Petitioner’s argument is patently incorrect and misleading, and should be rejected.

Petitioner also argues that Blain “teaches calculating profit values by automatically distributing costs to a cost center using the ‘dynamic method.’” Paper 1, p. 87 (quoting Ex. 1006, p. 217). Blain explains that this “dynamic method” is used to automatically divide costs between one or more accounts using subtotals in the general ledger. Ex. 1006, p. 217. However, Blain’s “dynamic method” does not disclose or suggest *independent* calculation of marginal profit values, i.e., such that one marginal profit value calculation does not depend on the result of another, as required by limitation 1[e(ii)].

Petitioner further contends that Blain discloses calculating “any objects’ profitability using ‘marginal and absorption costing in parallel.’” Paper 1, p. 87 (quoting Ex. 1006, p. 306). Blain states that this can occur when “the system split[s] the costs into fixed and variable components.” Ex. 1006, p. 306. At best, Blain discloses that a marginal profit value can be calculated with an absorption profit value. *Id.* But this is not the same as “independently calculat[ing]” marginal profit values for each object without first needing the result of another marginal profit value calculation, as required by limitation 1[e(ii)]. *See supra* Section VII.B.2.

In sum, while Petitioner points to Blain’s occasional use of words like “independent” and “parallel,” none of these instances disclose, teach, or suggest

independently calculating at least one marginal value of profit for each object being measured as required by the challenged claims.

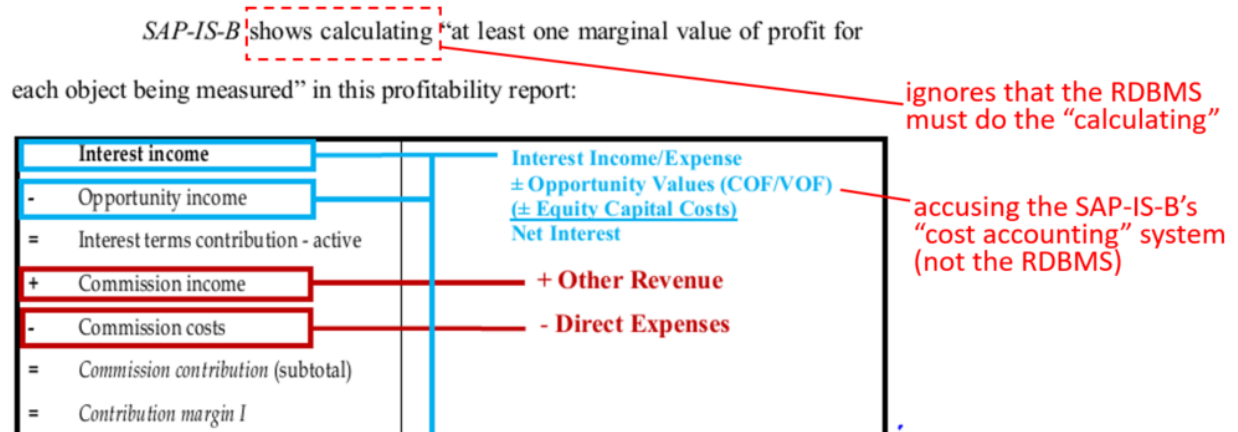
D. Grounds 6-7: Petitioner Fails to Establish Claims 1, 3 and 8 are Anticipated and Rendered Obvious by SAP-IS-B

Petitioner argues that claims 1, 3, and 8 are anticipated by SAP-IS-B (Ground 6) or rendered obvious by SAP-IS-B (Ground 7). *See generally*, Paper 1, pp. 89-112. As set forth below, Petitioner has failed to meet its burden.

1. SAP-IS-B fails to disclose limitation 1[e(i)]: “using the relational database management system to ... calculate”

As discussed above, claim 1 recites using the RDBMS *itself* to perform profitability calculations, rather than an application program. *See supra* Section VII.B.1. Petitioner has failed to meet its burden to show that SAP-IS-B discloses or renders obvious using the RDBMS to calculate marginal profit values.

First, nowhere does the Petition’s discussion of SAP-IS-B (spanning from pages 89 to 112) even attempt to show an RDBMS performing profit calculations. Illustrating the point, Petitioner accuses SAP’s cost accounting system of performing the “calculating” not the RDBMS:



Paper 1 at 100 (citing Ex. 1007, p. 63). Petitioner's failure to address what claim 1 actually says – "using the [RDBMS] to ... calculate" – is alone dispositive of Grounds 6-7.

Besides, had the Petition tried to squarely address limitation 1[e(i)], it would have failed because SAP-IS-B indicates that any profitability calculations would be performed by Cost Accounting or Bank Profitability Analysis modules, not the RDBMS. In particular, SAP-IS-B is directed to the SAP-R/3 software product (Paper 1, p. 13; Ex. 1016, ¶ 92) as Blain (Ex. 1006); Ex. 2001 ¶¶ 58-62; *See supra* Section IX.C.1. Like Blain, SAP-IS-B explains that the "standard R/3 system architecture" includes: (1) a database server "for carrying out all functions requiring access to the database"; and (2) "application servers *for carrying out the actual dialog processing.*"

SAP-IS-B's "three-tier" architecture

The standard R/3 System architecture consists of a three-tier hierarchy comprising:

- ❑ a host (database server) for carrying out all functions requiring access to the database.
- ❑ connected to this, several application servers for carrying out the actual dialog processing
- ❑ linked to this, in turn, several workstations (presentation servers) for the presentation functions.

Ex. 1007, p. 19 (annotated). On one hand, SAP-IS-B's "database server" (which hosts the RDBMS) "carr[ies] out all functions requiring access to the database." Ex. 1007, p. 19; Paper 1, p. 91 (identifying SAP-IS-B's database server as hosting "well-known RDBMSs," such as "DB2, Oracle and MS SQL"). On the other hand, SAP-IS-B's "application servers" host and carry out "the actual dialog processing," of SAP's software applications, including the "dialog-based" / "dialog-oriented" costing and profitability calculations of the Cost Accounting and Bank Profitability Analysis modules. Ex. 1007, p. 10, 19, 60. Ex. 2001, ¶¶ 58-62. In other words, SAP-IS-B employs a multi-tier system in which application servers—not the RDBMS database itself -- carry out profitability calculations according to user input. Ex. 2001, ¶ 62.

Indeed, Petitioner points to the functionality of SAP-IS-B's "Cost Accounting system," specifically, that "various cost accounting systems can run in parallel" for

limitation 1[e(ii)]. Paper 1, p. 97 (quoting Ex. 1007, p. 10). However, in the sentence immediately prior to what is quoted by Petitioner, SAP-IS-B states that this “Cost Accounting system” is “dialog-oriented.” Ex. 1007, p. 10. As discussed above, SAP-IS-B teaches that “the actual dialog processing” is performed by the application servers – not the RDBMS. *Id.*, p. 19.

Elsewhere, Petitioner relies on the Bank Profitability Analysis function of p. 60 of SAP-IS-B. Paper 1, p. 31 (citing Ex. 1007, p. 60). Still, SAP-IS-B, yet again, states that this Bank Profitability Analysis function is “a dialog-based flexible reporting system” – relying on the same dialog processing SAP-IS-B states executes on the application servers, not the RDBMS servers. *Id.*, p. 60. In other words, even if SAP-IS-B disclosed independently calculating marginal profit values (which it does not – *see infra* Section IX.D.2), SAP-IS-B is explicit that such calculations are not performed by the RDBMS and forecloses any argument by Petitioner to the contrary.

Accordingly, Petitioner has failed to meet its burden that SAP-IS-B anticipates any of the challenged claims (Ground 6). And because Petitioner does not argue that SAP-IS-B renders limitation 1[e(i)] obvious (*see* Paper 1, pp. 93-95), Petitioner has also failed to meet its burden in connection with Ground 7.

2. SAP-IS-B fails to disclose limitation 1[e(ii)]: “independently calculate at least one marginal value of profit”

As discussed above, the phrase “independently calculate” in limitation 1[e(ii)] requires that the RDBMS performs marginal profit value calculations “independently.” *See supra* Section VII.B.2. Petitioner has failed to meet its burden to show that SAP-IS-B discloses or renders obvious independently calculating marginal profit values.

For this limitation, Petitioner first quotes the following from SAP-IS-B: “all selected costing methods are analyzed simultaneously; IS-B then issues a list of relevant fields, sorted according to tables.” Paper 1, p. 97 (quoting Ex. 1007, p. 36). Petitioner’s quotation is found in a section entitled “Required/Optional Control,” which describes “an analysis tool which you can use to display the data which has to be transferred to IS-B.” Ex. 1007, p. 35. After analyzing the costing methods, “IS-B **then** issues a list of relevant fields,” which “tells you whether the determined fields are: required for costing,” “potentially useful,” or “required in conjunction with other information.” Ex. 1007, p. 36 (emphasis added). This “list of relevant fields” allows a user to “see at a glance which data from the operative systems **is needed to carry out the required calculation** in IS-B.” *Id.* (emphasis added).

Thus, while SAP-IS-B does state that costing methods “are analyzed simultaneously,” this occurs **before** any calculations are performed. *Id.* In other

words, when Petitioner’s quotation is considered in its full context, it is clear that SAP-IS-B does not disclose, teach, or suggest “simultaneously” or “independently” calculating marginal profit values for each object being measured. Instead, SAP-IS-B merely describes how the system can tell the user what information is needed to eventually perform certain calculations at a later time. Ex. 1007, p. 36

Petitioner next points to page 10 of SAP-IS-B, which states: “various cost accounting systems can run in parallel.” Paper 1, p. 97 (quoting Ex. 1007, p. 10). But this sentence, at best, merely discloses that multiple “cost accounting” systems, as a whole, can run in parallel. Ex. 1007, p. 10. The ‘316 patent does not purport to have invented parallel processing. *See* Ex. 1001, 2:7-8 (acknowledging that “massively parallel computing capability” was known). Instead, the challenged claims specify that marginal profit values are calculated “independently,” which facilitates utilizing “massively parallel computing operations.” *Id.*, 6:4-5; *see supra* Section VII.A.2.b. Contrary to Petitioner’s assertions, SAP-IS-B’s statement that a first cost accounting system can “run in parallel” with another cost accounting system (performing unspecified calculations) is not equivalent to a disclosure of “independently calculating” marginal profit values for each object being measured as required by limitation 1[e(ii)] of the challenged claims.

All told, Petitioner has fallen well short of meeting its burden for Ground 6. Instead of showing with particularity where SAP-IS-B discloses limitation 1[e(ii)],

Petitioner points to words like “simultaneously” and “parallel” that, when considered in context, have nothing to do with the claimed invention. Petitioner does not offer any obviousness analysis for limitation 1[e(ii)] under Ground 7. Thus, Ground 7 fails for the same reasons.

E. Grounds 8-9: Petitioner Fails to Establish Claims 1, 3 and 8-24 are Rendered Obvious by E&Y and Blain, and also by E&Y, Blain, and SAP-IS-B

Petitioner next argues that claims 1, 3 and 8-24 are rendered obvious by E&Y and Blain and E&Y, Blain, and SAP-IS-B. *See generally*, Paper 1, pp. 113-17 (Ground 8). While Petitioner’s Ground 8-9 analysis offers a brief discussion of the purported obviousness of the claimed “rules,” petitioner offers no discussion addressing limitation 1[e(i)] (using the RDBMS to calculate) or 1[e(ii)] (independently calculate). Paper 1 at p. 116. As discussed above in Sections IX.B – IX.D, none of E&Y, Blain or SAP-IS-B disclose, teach, or suggest at least limitations 1[e(i)] (using the RDBMS to calculate) and 1[e(ii)] (independently calculate). And Petitioner does not articulate an obviousness argument for these missing limitations under Grounds 8-9. Accordingly, for at least the reasons discussed above for Grounds 2-7 (*see supra* Sections IX.B – IX.CD), Petitioner has failed to meet its burden in connection with Grounds 8-9.

F. Grounds 10-11: Petitioner Fails to Establish Claims 9-24 are Rendered Obvious by E&Y, Blain, and Kimball; and E&Y, Blain, SAP-IS-B, and Kimball

Lastly, Petitioner argues that dependent claims 9-24 are rendered obvious by the combination of E&Y, Blain, and Kimball (Ground 10) and by the combination of E&Y, Blain, SAP-IS-B, and Kimball (Ground 11). *See generally*, Paper 1, pp. 117-25.

Petitioner's analysis for Grounds 10-11 provides no discussion of limitation 1[e(i)] (using the RDBMS to calculate) or 1[e(ii)] (independently calculate). As discussed above in Sections IX.B – IX.D, none of E&Y, Blain or SAP-IS-B disclose, teach, or suggest at least limitations 1[e(i)] (using the RDBMS to calculate) and 1[e(ii)] (independently calculate). And Petitioner does not articulate an obviousness argument for these missing limitations under Grounds 10-11. Accordingly, for at least the reasons discussed above for Grounds 2-7 (*see supra* Sections IX.B – IX.CD), Petitioner has failed to meet its burden in connection with the dependent claims of Grounds 10-11. *See, e.g., Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331, 1344 (Fed. Cir. 2009) (error finding dependent claim obvious when broader independent claim is nonobvious). Patent Owner reserves the right to raise additional challenges for these dependent claims should the Board decide to institute.

X. Conclusion

For brevity, Patent Owner may not have addressed all characterizations of the applied references and the challenged claims and reserves the right to do so should institution be granted. The absence of a response by Patent Owner to any of the positions presented in the Petition or expert declaration does not constitute a concession to those positions. The fact that Patent Owner's Preliminary Response has focused on particular arguments does not constitute a concession that there are no other arguments for patentability of the challenged claims.

For each of the foregoing reasons, the Petition should be denied as to each of the grounds requested.

Respectfully submitted,

Dated: April 10, 2019

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CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing Patent Owner's Preliminary Response is produced using a 14-point Times New Roman font and contains approximately 14,661 words, which is less than the 18,700 total words permitted by the U.S. Patent Trial and Appeal Board rules. Counsel relies on the word count of the computer program used to prepare the response.

Dated: April 10, 2019

By: /Matthew A. Werber/

Lead Counsel for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Patent Owner's Corrected Preliminary Response together with all exhibits filed therewith was served on April 10, 2019 upon the following parties via electronic service:

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