

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TERADATA OPERATIONS, INC.
Petitioner

v.
BERKLEY*IEOR, L.L.C.,
Patent Owner

Case CBMR {____}

Patent 8,612,316

**PETITION FOR *COVERED BUSINESS METHOD* REVIEW OF CLAIMS 2,
4-7, and 25-30 OF U.S. PATENT NO. 8,612,316 UNDER 35 U.S.C. § 321,
AND § 18 OF THE LEAHY-SMITH AMERICA INVENTS ACT**

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LIST OF EXHIBITS

1001	U.S. Patent No. 8,612,316 by Richard Tad Lepman, entitled “Process for Determining Object Level Profitability”
1002	File History for U.S. Patent No. 8,612,316
1003	Second Amended Complaint for Patent Infringement, <i>Berkeley*IEOR d/b/a/ B*IEOR v. WW Grainger, Inc. et al</i> , 1-17-cv-07472, Dkt. 41 (March 26, 2018)
1004	C.J. Date, <i>A Guide to the SQL Standard</i> (2d ed. 1989) (“Date”)
1005	Ernst & Young, <i>The Ernst & Young Guide to Performance Measurement for Financial Institutions</i> (1995) (“E&Y”)
1006	Jonathon Blain et al., <i>Using SAP R/3</i> (1996) (“Blain”)
1007	<i>Detailed Functions – System R/3 – IS-B – The SAP Industry Solution For Banks</i> (Certified Translation of <i>Funktionen im Detail – IS-B System R/3: Einzelgeschäftskalkulation/Meldewesen</i> , Walldorf, Germany: SAP AG (1996)) (“SAP-IS-B”)
1008	Julie Mabblerley, <i>Activity-based Costing in Financial Institutions</i> Pitman Publishing (1994) (“Mabblerley”)
1009	Nic Stuchfield & Bruce Weber, <i>Modeling the Profitability of Customer Relationships: Development and Impact of Barclays De Zoete Wedd'S Beatrice</i> , NYU Information Systems Working Papers Series IS-92-23 (Aug. 1992) (“Weber”)
1010	Ralph C. Kimball, <i>Calculating and Using Risk-adjusted ROE for Lines of Business</i> , Bank Accounting & Finance (Fall 1993) (“Kimball”)
1011	Kenneth J. McKenzie & Aileen J. Thompson, <i>Economic Effects of Dividend Taxation</i> , Tech. Committee on Bus. Tax’n, Working Paper 96-7 (Dec. 1996) (“McKenzie”)

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1012	Frances X. Frei, Patrick T. Harker, Larry W. Hunter, <i>Innovation in Retail Banking</i> , Wharton Financial Institutions Center (Jan. 1998) (“Frei”)
1013	Charles T. Horngren et al., <i>Cost Accounting: A Managerial Emphasis</i> (9 th ed. 1997) (“Horngren”)
1014	C.J. Date, <i>An Introduction to Database Systems</i> (6th ed. 1995) (“Database Systems”).
1015	File History for US Patent Application No. 09/545,628
1016	Bruce Weber Expert Declaration
1017	Hall-Ellis Declaration
1018	Wells Fargo 1996 Annual Report (1997)
1019	Ralph C. Kimball, <i>Innovations in Performance Measurement in Banking</i> , New England Economic Review (1997).
1020	Basel I Accords (1988)
1021	<i>Funktionen im Detail – IS-B System R/3: Einzelgeschäftskalkulation/Meldewesen</i> , Walldorf, Germany: SAP AG (1996) – Received from Stuttgart Library
1022	Affidavit of Christopher Butler of Internet Archive for <i>Funktionen im Detail: System R/3 IS-B The SAP Industry Solution For Banks</i> . Walldorf, Germany: SAP AG (1995).
1023	<i>Funktionen im Detail – IS-B System R/3: Einzelgeschäftskalkulation/Meldewesen</i> , Walldorf, Germany: SAP AG (1996) – Downloaded by Dr. Hall-Ellis from Wayback Machine dated July 1997
1024	“SAP Advertisement.” <i>Computerworld</i> , Special Editorial Supplement, vol. 31, no. 30 (July 28, 1997): 65-66.
1025	“Smooth Transitions: SAP Advertisements.” <i>CIO</i> , vol. 10, no. 19 (Aug. 1997): 91-93.

I. MANDATORY NOTICES, STANDING, AND FEES

Real Party in Interest: Teradata Operations, Inc. is the Petitioner. Teradata Operations, Inc. is a wholly owned subsidiary of Teradata Corporation, a publicly traded company. Teradata's co-defendants in a suit brought by Patent Owner asserting the challenged patent include: (1) W.W. Grainger, Inc. , (2) DHL Express (USA), Inc., (3) Danzas Corporation d/b/a DHL Global Forwarding, and (4) Air Express International USA, Inc. d/b/a DHL Global Forwarding are also real parties in interest.

Related Matters: The U.S. Patent No. 8,612,316 (the "316 Patent") is currently involved in a pending lawsuit involving Petitioner entitled *Berkeley*IEOR d/b/a B*IEOR v. WW Grainger, Inc. et al.*, in the U.S. District Court in the Northern District of Illinois, Case No. 1:17-cv-07472 (the "District Court Action"). See Ex[1003]. Patent Owner asserts U.S. Patent No. 8,612,316 against Petitioner and its customer defendants in the District Court Action. Ex[1003] 52-56.

Lead Counsel and Request for Authorization: Pursuant to 37 C.F.R. §§42.8(b)(3) and 42.10(a), Petitioner designates the following: Lead Counsel is Eliot D. Williams (Reg. No. 50,822) of Baker Botts L.L.P.; Back-up Counsel is Jamie R. Lynn (Reg. No. 63,666).

Service Information: Service information is as follows: Baker Botts L.L.P., 1001 Page Mill Rd., Palo Alto, CA 94304-1007 Tel. 650 739 7500; Fax

650-736-7699. Petitioner consents to service by electronic mail at eliot.williams@bakerbotts.com, jamie.lynn@bakerbotts.com. A Power of Attorney is filed concurrently herewith under 37 C.F.R. §42.10(b).

Fees: The Office is authorized to charge the fee set forth in 37 C.F.R. §42.15(b) to Deposit Account No. 02-0384 as well as any additional fees that might be due in connection with this Petition.

II. GROUNDS FOR STANDING

The undersigned and Petitioner certify that the ‘316 Patent is eligible for covered business method review and Petitioner meets the eligibility requirements of 37 C.F.R. §42.302.

Berkley*IEOR (“PO”) sued Teradata for infringement of the ‘316 Patent. Ex[1003]. Thus, Teradata has standing to file this petition. 37 C.F.R. §42.302(a). Neither Petitioner nor any real party-in-interest or privy is estopped from challenging the claims on the grounds herein. 37 C.F.R. §42.302(b).

A. The ‘316 Patent is Directed to a CBM

The ‘316 Patent is a “covered business method” (“CBM”) patent under §18(d)(1) of the Leahy-Smith America Invents Act, Pub. L. 112-29 (“AIA”) and 37 C.F.R. §42.301. A CBM patent is “a patent that claims a method or corresponding apparatus for performing data processing or other operations used in the practice, administration, or management of a financial product or service, except that the term does not include patents for technological inventions.” AIA

§18(d)(1). This includes claims “pertaining or related to money matters.” *Versata Dev. Grp., Inc. v. SAP Am., Inc.*, 793 F.3d 1306, 1325 (Fed. Cir. 2015).

1. The Claims are Directed to a Financial Product or Service

(i) Claim 1

The challenged claims, including at least Claim 1, are CBM-eligible because they claim “a process” ... “for performing data processing ... in the practice ... of a financial product or service.” Claim 1 includes a “profit database,” “calculating opportunity values for funds used,” “performing a profit calculus,” “calculat[ing] ... marginal value of profit,” and creating “a measure of object level profitability.” These are expressly “financial in nature” and well-within the definition of a CBM patent. The complete claim language supports this; Claim 1 produces a measure of profit as its result, expressly providing a financial service to consumers of this data.

The elements are closer to CBM-eligibility than other similar cases. See *Versata*, at 1325 (a “method for determining price”); *CareCloud Corp. v. AthenaHealth, Inc.*, CBM2014-00143, p. 12 (P.T.A.B. 2014) (“ ‘payment’ requirements ... are clearly financial in nature”); *Blue Calypso*, at 1340 (a “subsidy” is an “express financial component”); *GSN Games, Inc. v. Bally Gaming, Inc.*, CBM2015-00155, p. 7-8 (P.T.A.B Jan. 21, 2016) (“award[ing] prizes based on a desired profit level” “is financial in nature.”). Recently, the PTAB rejected arguments that claims for “storing and retrieving of financial

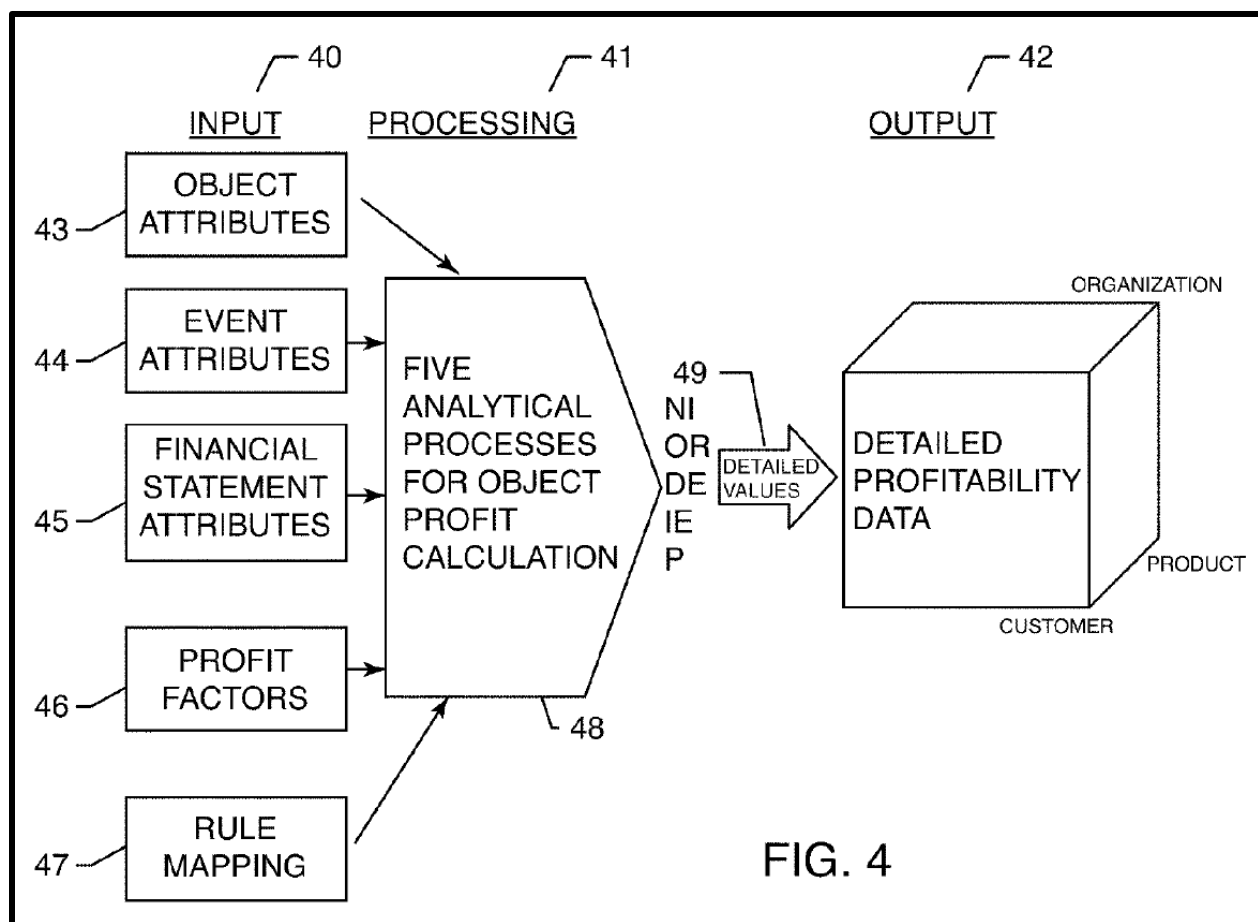
documents” were merely “‘incidental to’ or ‘complementary to’ financial activity,”; finding them CBM claims. *Fidelity Information Services, LLC v. Mirror Imaging, LLC*, CBM2017-00066, Paper 26, p. 17-18 (P.T.A.B. Apr. 27, 2018); *see also Liberty Mut. Ins. Co. v. Progressive Cas. Ins. Co.*, CBM2013-00009, p. 6 (P.T.A.B. 2013) (determining the “cost of insurance” renders claims CBM-eligible).

The specification confirms this:

“The process of ***measuring profit is an important business activity***. Profit measures are the primary basis for understanding ***financial performance*** and value creation in a business.”

Ex[1001] 1:17-19, 1:27-34 (“internal profit measures” is a form of “internal ***financial*** performance measures”).

Figure 4 shows processing financial statement attributes and profit factors to calculate a profit. Ex[1001] Fig. 4. Another case found “storing and retrieving financial documents” to be financial. *Fidelity*, at 18.



Ex[1001] Fig. 4.

The inventor's statements in a parent application support this; he distinguished prior art, explaining: "[Price] does not discuss methods of marginal **pricing** (activity based costing or **funds transfer pricing**) necessary for object profit measures" and "Price's scope is financial bookkeeping and not economic theory or **market based financial concepts**." Ex[1015] 256-267.

Accordingly, Claim 1 and its dependents are directed to data processing and operation of a financial product or service.

(ii) *Dependent claims*

Several dependent claims add additional financial elements:

- Claim 5 – calculating indirect expense (“an ***apportioned profit value adjustment***”)
- Claim 7 – “adjusting the measure for ***object level profitability*** for ***taxes*** and/or object ***economic value***”
- Claims 7, 29-30 – “adjusting the measure of object level profitability” for “***tax(es)***”
- Claim 29 – “Shareholder Value Add” (“[SVA is] a method ***financial analysts use*** to adjust profit measure for risk”) Ex[1001] 22:51-52.

2. No Technological Invention

A patent is directed to a “technological invention” only if “the claimed subject matter as a whole” (1) “recites a technological feature that is novel and unobvious over the prior art” and (2) “solves a technical problem using a technical solution.” 37 C.F.R. §42.301(b). The claims satisfy neither prong.

The only elements arguably directed to a “technological feature” are the “database”, “relational database management system”, and “structured query language (SQL).” But “[c]laim drafting techniques” such as “[m]ere recitation of known technologies, such as computer hardware, communication or computer networks, software, memory, computer-readable storage medium, scanners,

display devices or **databases**, or specialized machines, such as an ATM or point of sale device” do not typically “render a patent a technological invention.” 77 Fed. Reg. 48,756, 48,763–64 (Aug. 14, 2012). And the claimed database features are well-known and established technologies. §§VII.A.3(ii)-(iv). Moreover, as shown in Sections VII.B-VII.F, the claims were previously disclosed by at least *E&Y* and *Blain* and do not “recite[] a technological feature that is novel and unobvious over the prior art.” 37 C.F.R. §42.301(b).

The Patent also fails the second prong; the claims are neither directed toward solving a technical problem nor provide a technical solution. Calculating profit using a general ledger is a business problem, not a technical one. Ex[1016] ¶115. Nothing in the claims recites a technical solution. Instead, the claims merely include general descriptions of desired functionality using traditional prior art structures. *Apple, Inc. v. Ameranth, Inc.*, 2016 WL 6958650, at *6 (Fed. Cir. 2016) (claims not technological, because “the claims did not recite a solution to this problem, as they do not include recitations about how to [perform the claimed function]”).

III. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Petitioner challenges Claims 2, 4-7, and 25-30.

A. Publications Relied Upon

The ‘316 Patent is not entitled to a priority date before April 9, 1999.

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Petitioner relies upon the following patents and publications, which could each be found by searching for the index terms or descriptive titles:

Exhibit 1005 — *E&Y* is a printed publication and prior art under 35 U.S.C. §§102(a) and 102(b). Ex[1017] ¶¶38-43. It was:

- available in libraries by April 1995 and currently available in 73 libraries;
- indexed by the terms/codes: “Financial institutions - Management,” “Bank management,” “Portfolio management,” and “Banks and banking – Accounting.”

Ex[1017] ¶¶38-43.

Exhibit 1006 — *Blain* is a printed publication and prior art under §§102(a) and 102(b). Ex[1017] ¶¶50-55. It was/is:

- available in libraries by September 1996 and currently available in 39 libraries;
- indexed by the terms/codes: “Computer software, integrated software,” “Integrated Software,” “Client/server computing,” “Business computer applications,” and “ABAP/4 (Computer programming language).”

Ex[1017] ¶¶50-55.

Exhibit 1007 — *SAP-IS-B* (“Funktionen im Detail – IS-B – System R/3: Einzelgeschäftskalkulation/Meldewesen”) is a printed publication and prior art under §§102(a) and 102(b). Ex[1017] ¶¶115-124. It was/is available:

- on SAP’s website by July 1997 and currently available on the Internet Archive;
- in public libraries:
 - by September 1997 and currently available in 6 libraries;
 - indexed by the terms “SAP R/3,” “Bank,” and “Kalkulation” (German for calculation).

Ex[1017] ¶¶115-124. Ex[1007] contains a certified English translation and the original German version; Ex[1023] contains a scanned library copy. The text is identical, save pagination differences. Ex[1017] ¶123. An English version (Ex[1022]) with substantially similar disclosure was available on SAP’s “Media Center” by July 1997. Ex[1022]; Ex[1017] ¶¶97-100. A POSITA interested in this Patent’s subject matter would know to look at SAP’s website (www.sap.com) and find the German and English versions by simply clicking “Industry Solutions” -> “SAP Banking” -> “Media Center.” Ex[1022]; Ex[1016] ¶96. In 1997 SAP advertised this website to POSITAs. Ex[1024], Ex[1025]. Blain also instructs POSITAs to look to SAP’s website. Ex[1016] ¶96. Or a POSITA could search library databases using any combination of terms known to a POSITA interested in

the subject matter of the Patent (Ex[1016] ¶96): “SAP R/3”, “Bank”, and “Kalkulation”, yielding between 1 and 77 results. Ex[1017] ¶124.

Exhibit 1010 — *Kimball* is a printed publication and prior art under §§102(a) and 102(b). Ex[1017] ¶¶86-92. It was/is:

- available in libraries by November 1993 and currently available in 96 libraries;
- indexed by the terms/codes: “Banking,” “Accounting,” “Bookkeeping,” “Banks and Banking.”

Ex[1017] ¶¶86-92.

Exhibit 1011 — *McKenzie* is a printed publication and prior art under §§102(a) and 102(b). Ex[1017] ¶¶74-79. It was/is:

- available in libraries by April 1997 and currently available in 32 libraries;
- indexed by the terms “Dividend – Taxation” and “Dividends – Taxation – Canada,” “Internal revenue,” “Income tax,” “Income from investments,” and “Capital gains tax.”

Ex[1017] ¶¶74-79.

B. Grounds

Ground	References	Basis	Claims
1		§101	2, 4-7, 25-30
2	<i>E&Y</i>	§102	2, 4-7, 25-29
3	<i>E&Y</i>	§103	2, 4-7, 25-30
4	<i>Blain</i>	§102	2, 4-5, 25
5	<i>Blain</i>	§103	2, 4-5, 25
6	<i>SAP-IS-B</i>	§102	2-6
7	<i>SAP-IS-B</i>	§103	2-6
8	<i>E&Y</i> in view of <i>Blain</i>	§103	2, 4-7, 25-30
9	<i>E&Y</i> , in view of <i>Blain</i> , and <i>SAP-IS-B</i>	§103	2, 4-7, 25-30
10	<i>E&Y</i> in view of <i>Blain</i> , and <i>Kimball</i>	§103	29
11	<i>E&Y</i> in view of <i>Blain</i> , <i>SAP-IS-B</i> , and <i>Kimball</i>	§103	29
12	<i>E&Y</i> , in view of <i>Blain</i> , and <i>McKenzie</i>	§103	30
13	<i>E&Y</i> , in view of <i>Blain</i> , <i>SAP-IS-B</i> , and <i>McKenzie</i>	§103	30

IV. OVERVIEW OF THE PATENT

The ‘316 Patent claims priority to a Provisional Application filed on April 9, 1999. Ex[1001]. The Patent describes a “process for determining object-level profitability” using a relational database. Ex[1001] 4:42-43, Abstract; Ex[1016] ¶¶66-68. It explains that “[t]he process of measuring profit is an

important business activity” where “[p]rofit measures are the primary basis for understanding financial performance and value creation in a business.” Ex[1001] 1:17-19. It also describes using a relational database system to calculate opportunity values, marginal values of profit, and a full absorbed profit value adjustment to calculate profitability for an object. Ex[1016] ¶¶66-68.

V. SUMMARY OF PRIOR ART

The patent claims what was well-known in the prior art. None of the prior art discussed below was considered during prosecution. Ex[1001], Ex[1002]. These references are directed to the same field (profitability measurement systems); operate using the same architecture (generic computers and databases); and are designed to solve the same problem (calculating object level profitability).

All citations to exhibits use the internal (*e.g.*, non-Bates page numbers) except for Ex[1007] which refers to the Bates page numbers.

A. *E&Y* (Ex[1005])

E&Y is a book, published in 1995 as a guide for financial practitioners. §III.A; Ex[1017] ¶¶38-43; Ex[1016] ¶¶76-86. *E&Y* describes in great detail various methods of measuring performance in financial institutions, including object level profitability accounting. Ex[1005]; Ex[1016] ¶¶76-86.

B. *Blain* (Ex[1006])

Blain is a book written in 1996 by ASAP World Consultancy and Jonathon Blain. §III.A; Ex[1017] ¶¶50-55; Ex[1016] ¶¶87-91. *Blain* describes the SAP-R/3 product, developed by SAP AG and launched in 1992, that provides enterprise resource planning software (“ERP”) for companies using a modular suite of integrated business management applications. Ex[1016] ¶¶87-91.

C. *SAP-IS-B* (Ex[1007])

SAP-IS-B is a 1996 technical paper issued by SAP and publicly available on SAP’s website no later than July 1997 and in libraries no later than September 1997. §III.A; Ex[1017] ¶¶115-124. *SAP-IS-B* describes SAP’s “Industry Solutions – Banking” product module, which (as discussed in *Blain* (Ex[1006] 585)) integrates with the SAP-R/3 enterprise software and provides functionality specific to banking industry including the object level profitability analysis of the challenged claims. Ex[1007] 9-12; Ex[1016] ¶¶ 92-95.

D. *Kimball* (Ex[1010])

Kimball is a 1993 article written by Ralph C. Kimball published in the journal *Bank Accounting & Finance*. §III.A; Ex[1017] ¶¶86-92. *Kimball*

provides additional detail on allocating equity to lines of business, enabling object level profitability accounting. Ex[1016] ¶¶544-580.

E. *McKenzie* (Ex[1011])

McKenzie is a 1996 publication document created by Kenneth J. McKenzie and Aileen J. Thompson (“*McKenzie*”) and issued by the Canadian Department of Finance. §III.A; Ex[1017] ¶¶74-79. *McKenzie* was published by the Technical Committee on Business Taxation and identified as a Working Paper in December 1996. Ex[1017] ¶74.

F. Other References

In addition to the prior art described above, other references will be used throughout this petition. Other than *Date*, none of the following references were considered during prosecution of the ‘316 Patent or any of its parents.

Horngren is a college textbook on Cost Accounting, published in 1997. Ex[1017] ¶¶44-49; Ex[1013]. It was publicly available by March 1996. Ex[1017] ¶¶44-49.

Date is the second edition of a book written by C.J. Date (“*Date*”) issued by Addison-Wesley in 1989. Ex[1017] ¶¶56-61; Ex[1004]. It was publicly available by January 1989. Ex[1017] ¶¶56-61. The 1st edition of this book is incorporated by reference in the ‘316 Patent. Ex[1001] 2:53-55.

Database Systems is a book written by C.J. Date and released by Addison-Wesley in 1994. Ex[1017] ¶¶80-85; Ex[1014]. It was publicly available by February 1994. Ex[1017] ¶¶80-85.

Wells is an annual financial report issued by Wells Fargo & Company and available to the public in 1997. Ex[1017] ¶¶95-96; Ex[1018].

Mabberley is a book written by Julie Mabberley and issued by Pitman Publishing in 1992. Ex[1017] ¶¶62-67. It was publicly available by March 1993. Ex[1017] ¶¶62-67.

Weber is a working group paper by Nic Stuchfield and Bruce Weber and issued by New York University in 1992. Ex[1017] ¶¶68-73. It was publicly available by March 1993. Ex[1017] ¶¶68-73.

Frei is a technical paper written by Frances X. Frei, Patrick T. Harker, and Larry W. Hunter and issued by The Wharton School at the University of Pennsylvania in January 1998. Ex[1017] ¶¶93-94. It was publicly available by January 1998. Ex[1017] ¶¶93-94.

VI. CLAIM CONSTRUCTION

The claim terms are to be given their broadest reasonable interpretation, as understood by one of ordinary skill in the art and consistent with

the disclosure.¹ To the extent the Applicant has expressly defined a claim term in the specification, Petitioner has used that definition. Otherwise, the following terms should be construed:

A. Level of Ordinary Skill in the Art

A person of ordinary skill in the art would have at least a Bachelor's Degree in computer science, accounting, or management information systems, or a similar field with at least two years of experience in accounting or finance software, or a person with a master's degree in computer science, accounting, or management information systems, or a similar field with a specialization in accounting or finance software. Ex[1016] ¶63. A person with less education but more relevant practical experience may also meet this standard.

B. “profit information” (Claim 1)

A POSITA would have understood that the term “profit information” to mean “financial and/or non-financial data related to calculating profit.” Ex[1016] ¶¶73-74. The specification identifies both financial (*e.g.*, balances, rates, expected loss frequency) and non-financial (*e.g.*, product identification, dates) as information to be stored in the database, and thus is not limited to financial information. Ex[1001] 4:56-63, 6:44-48, 7:30-42, 7:51-56; Ex[1016] ¶¶73-74.

¹ Petitioner's invalidity arguments apply regardless of what claim construction standard is used. Ex[1016] ¶72.

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 2, 4-7, and 25-30 are unpatentable as patent-ineligible subject matter

1. Legal Standard

Section 101 prohibits patenting abstract ideas. *Bilski v. Kappos*, 561 U.S. 593, 602 (2010); *Mayo Collaborative Services v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012). Assessing subject matter eligibility follows a two-step analysis. *Alice v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014). The first step is “to determine whether the claims at issue are directed to ... patent-ineligible concepts.” *Alice*, at 2355; *Bilski*, at 608 (finding claims drawn to “both the concept of hedging risk and the application of that concept to energy markets” to be patent-ineligible); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014) (claims drawn to “showing an advertisement before delivering free content” were patent-ineligible). To uncover the abstract idea, one must “identify the purpose of the claim—in other words, determine what the claimed invention is trying to achieve—and ask whether that purpose is abstract.” *Enfish, LLC v. Microsoft Corp.*, 56 F. Supp. 3d 1167, 1173 (C.D. Cal. 2014).

If the claims are directed to a patent-ineligible concept, the second step is to determine whether the claim limitations, analyzed individually and as ordered combinations, contain an inventive concept transforming the claims into patent-eligible subject matter. *Mayo*, at 1293-94. “A claim that recites an

abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’ *Alice*, at 2357. Indeed, to transform an abstract idea into eligible subject matter, the recited “additional features” must be more than “well-understood, routine, conventional activit[ies].” *Mayo*, at 1298.

An abstract idea is not eligible simply because the claim is directed to a computer system or network, or involves a computing environment. “[T]he mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention ... [nor] is limiting the use of an abstract idea to a particular technological environment” enough to impart patent eligibility. *Alice*, at 2358; *see also CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011). Indeed, using a computer “for no more than its most basic function—making calculations or computations—fails to circumvent the prohibition against patenting abstract ideas and mental processes.” *Bancorp Servs. LLC v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) (distinguishing “improvements to computer technologies” (potentially patent eligible) from the use of computers to merely improve speed or efficiency (not patent eligible)).

2. Independent Claim 1 - Directed to Abstract Idea of “calculating object level profitability”

Claim 1 is directed to the abstract idea of “calculating object level profitability.”² Ex[1001] 4:42-43, 28:55. Claim 1 recites the primary steps of “providing a relational database management system ... calculating opportunity values for funds used or supplied ... calculat[ing] at least one marginal value of profit ... and combining the at least one marginal value of profit to create a measure for object level profitability.” Ex[1001] 28:55-29:12. To be blunt, 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.. Ex[1016] ¶¶111-113. The remaining claim elements merely identify the generic technological environment (“database” and “relational database management system”) and add routine and conventional post-solution activity. Ex[1016] ¶¶111-113.

The first *Alice* step can involve asking “whether the focus of the claims is on the specific asserted improvement in computer capabilities...or, instead, on a process that qualifies as an ‘abstract idea’ for which computers are invoked merely as a tool.” *Enfish*, at 1338. The ‘316 Patent confirms that the claimed hardware components are merely generic. The Patent admits its database is operated using “standard administration actions” and “[RDBMS] textbooks.”

² Although Claim 1 is not challenged in this Petition, it is the base claim for all challenged claims.

Ex[1001] 11:14-39; Ex[1008] ¶937; Ex[1016] ¶¶111-113. The Patent does not improve the operations of a relational database or computer, but merely uses those generic components to implement the abstract idea. Ex[1016] ¶¶111-113. The Patent is thus directed to solving a business problem, not improving the performance of a database or computer such as by increasing its speed or efficiency. *Bancorp Servs.*, at 1278.

Similar to *Alice* and *Bilski*, Claim 1 is directed to the abstract idea involving an economic practice. In *Alice*, the claims were directed to the abstract idea of “intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk” that was a “fundamental economic practice long prevalent in our system of commerce.” *Alice*, at 2356. *Alice* also found that, in step two, the “mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.” *Alice*, at 2358. In *Bilski*, the claims were directed to the “basic concept of hedging, or protecting against risk,” and the court held that “[h]edging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class.” *Bilski*, at 611. Like *Alice* and *Bilski*, Claim 1 is directed to the abstract idea of calculating object level profitability - a widely-used, fundamental economic practice. Ex[1001] 4:42-43; §VII.A.3; Ex[1016] ¶¶111-113.

In *Versata*, the claims were directed to the abstract idea of “determining a price, using organizational and product group hierarchies” – *e.g.*, a

“basic conceptual framework for organizing information.” *Versata*, at 1334. *Versata*’s abstract idea is similar to the challenged Patent; while *Versata* determined price using organizational and product group hierarchies, the Patent determines profit using product, customer, and organizational hierarchical objects. Ex[1001] 4:42-44. Similar to the abstract claims in *CyberSource*, the claims in *Versata* and the challenged Patent recite a “method [that] could be performed in the human mind or by a human using a pen and paper.” *Versata*, at 1333 (citing *CyberSource Corp.*, at 1366).

In *Electric Power Group*, the claims were directed to the abstract idea of “collecting information, analyzing it, and displaying certain results of the collection and analysis.” The Court stated that “information as such is an intangible,” and accordingly “have treated collecting information, including when limited to a particular content” as “within the realm of abstract ideas.” *Electric Power Group LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). They said, “we have treated analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category.” *Id.* at 1354. Similar to the claims in *Electric Power Group*, the Challenged Claims simply collect information (financial and non-financial information) and analyze that information to calculate profitability. The Challenged Claims do not even disclose displaying the results, as in *Electric Power Group*. The steps of the Challenged Claims represent a

mental process, as calculating object level profitability for an organization can be calculated by a human on pen and paper. *See* Ex[1013]; *see also* Ex[1005].

In *GSN Games*, the claims were directed to the abstract idea of “profitably awarding prizes to game players.” *GSN Games, Inc. v. Bally Gaming, Inc.*, CBM2015-00155, 15, (Jan. 2016). There, the “idea of profitably awarding prizes to game players represents a ‘disembodied concept,’ a basic building block of human ingenuity and rises to the level of an abstract idea.” *Id.* The Challenged Claims recite similar limitations – calculating profitability – but fail to provide any post-calculation activity like determining a prize based on profitability. The Challenged Claims fail to provide limitations that claim patent-eligible subject matter, only claiming the basic building block of human ingenuity of calculating object level profitability.

In *BSG Tech*, a method for indexing a database by considering historical usage information was found directed to an abstract idea. *BSG Tech LLC v. Buyseasons, Inc.*, 2018 U.S. App. LEXIS 22704, at *12 (Fed. Cir. 2018). The Court dismissed arguments that the “claimed invention improves the quality of information added to the database and the organization of information in the database” because “[t]hese benefits, however, are not improvements to the database functionality. Instead, they are benefits that flow from performing an abstract idea in conjunction with a well-known database structure.” *BSG Tech*, at *14-15. As in *BSG Tech*, the Challenged Claims do not improve the functionality

of a database; rather, they use a conventional database to perform financial calculations. Thus, recitations of a database fail to provide limitations that claim patent-eligible subject matter.

3. Independent Claim 1 Contains No “Inventive Concept”

Claim 1 fails to recite any “inventive concept” amounting to significantly more than the abstract idea. Claim 1 recites generic technologies – “database” and a “relational database management system” – that fail to transform the abstract idea into patent-eligible subject matter. The Patent even admits its database is operated using “standard administration actions” and “[RDBMS] textbooks.” Ex[1001] 11:14-39.

Prior decisions teach that generically using databases is insufficient to transform an abstract idea. *See Carecloud*; *see also BSG Tech*. For example, in *Carecloud* recitations of basic servers, databases, and client features added nothing more than the abstract idea itself. *Carecloud*, at 20. *Carecloud* says that storing rules in a rules database, updating the rules, and applying those rules were all well-understood, conventional activities; the “mere presence of methods or steps that may be performed by these servers, database, or client does not place these features into the category of a ‘technological invention.’” *Id.* at 14.

Carecloud can be distinguished from the patent-eligible rules in *McRO*. *McRO, Inc. v. Bandai Namco Games America, Inc.*, 837 F.3d 1299 (Fed.

Cir. 2016). In *McRO*, rules were defined to morph a 3-D character’s facial expression. Those rules were not abstract because the claimed rules “are limited to rules with certain common characteristics” that were not used by humans in the art, and solved a known problem. *Id.* at 1314. Thus, rules for character animation constituted a technological improvement that did not preempt all possible rule-based animation solutions. Unlike the rules in *McRO*, Claim 1’s recitation of rules in the relational database are business rules, not addressing a technological problem. Furthermore, Claim 1’s generic calculation of opportunity values and a marginal value of profit substantially preempt commonly performed calculations of profit. Thus, the recitation in Claim 1 of a computerized profit database, a relational database management system, and storing rules in the relational database fails to provide an inventive concept.

In *DDR*, the Federal Circuit explained that the claims in *Alice*, *Accenture*, *Bancorp*, and *Ultramercial* “were recited too broadly and generically to be considered sufficiently specific and meaningful applications of their underlying abstract ideas,” and noted that “[a]lthough many of the claims recited various computer hardware elements, these claims in substance were directed to nothing more than the performance of an abstract business practice on the Internet or using a conventional computer.” *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256 (Fed. Cir. 2014); *see also Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013). Moreover, in

DDR, it was recognized that, “after *Alice*, there can remain no doubt: recitation of generic computer limitations does not make an otherwise ineligible claim patent-eligible.” *DDR Holdings*, at 1256. The *DDR* claims survived because they recited a solution that “is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.” *Id.* at 1257. By contrast, the Challenged Claims recite features that were conventional and performed by humans without computers.

The limitations of Claim 1, both individually and as an ordered combination, fail to provide “significantly more” than the abstract idea of calculating object level profitability. Each element is addressed below.

(i) *Element 1[preamble]*

If the preamble is limiting, it fails to disclose any inventive step. Ex[1016] ¶114. As discussed below, calculating object level profitability using an RDBMS was well-known. Thus, the claim fails to add a meaningful limitation. Ex[1016] ¶114.

(ii) *Element 1[a]*

Database technology, and using databases on a computer, was well-known. Ex[1004]; Ex[1014] 2-10, 21-23; Ex[1016] ¶¶115-121; 77 Fed. Reg. 48,764 (“Mere recitation of known technologies” such as “databases” does not render a patent a technical innovation). Storing information was a primary

purpose of databases. Ex[1014] 2-4, 9-10. Storing profit information in a database was well-within the routine use of a database, and calling a database a “computerized profit database” does not transform the generic technology. Ex[1016] ¶¶115-121.

The specification admits the profit database was well-known in the art—describing accounting’s early adoption of “automated data processing solutions due to the match between computing capabilities of computers and the execution of the accounting process.” Ex[1001] 2:1-4. The specification emphasizes the historical use of computer automation in the field:

“The first large scale use of *automated computing technology* is frequently found to be the *automation of the financial control or accounting processes*, since it is *easy to develop software to implement accountancy rules* and there were large benefits in staff productivity easily observable.”

Ex[1001] 3:55-60.

Additionally, prior art shows 1[a] as well-known, routine and conventional as enumerated in Sections VII.B.1(ii), VII.C.1(ii), and VII.D.1(ii). Ex[1016] ¶¶115-121, 248-252, 410-413, 465-469. Prior art describes a profit database: “[m]uch of the information required for product costs and profitability reporting, can be obtained from a comprehensive financial database that holds items with some form of product indicator. This type of system is becoming much more common.” Ex[1008] 88; Ex[1016] ¶119.

(iii) *Element 1[b]*

Element 1[b] describes a generic “relational database management system” and a “computerized profit database.” Ex[1016] ¶¶122-125. As discussed above, a computerized profit database was well-known, routine and conventional in the field. §VII.A.3(ii). Using a relational database management system (“RDBMS”) was also well-known and conventional in the art. Ex[1014] 2-10, 21-23; Ex[1016] ¶¶122-125. Prior art, incorporated by reference in the patent, admits that relational database systems were widely available in 1987, including IBM’s DB2 database, Oracle’s ORACLE database, and Sybase’s SYBASE database. Ex[1004] 1-3; Ex[1014] 2-10, 21-23; Ex[1001] 2:53-55; Ex[1016] ¶¶122-125.

The interoperation of an RDBMS with the database also fails to provide an inventive concept. The purpose of a RDBMS is to operate with a database, and most RDBMSs are packaged with a database. Ex[1004] 1-3; Ex[1014] 21-23.

Additionally, the prior art discloses the elements of 1[b] as well-known, routine, and conventional in the art as described in Sections VII.B.1(iii), VII.C.1(iii), and VII.D.1(iii). Ex[1016] ¶¶122-125, 253-254, 414-416, 470-472.

(iv) *Element 1[c]*

As discussed above, preparing profit information for use in a computerized database, such as a RDMS was well-known, conventional, and routine in the art. Ex[1016] ¶¶126-134.

“calculating opportunity values for funds used or supplied”

To the extent “calculating opportunity values for funds used or supplied” is not itself integral to the abstract idea, it fails to provide an inventive concept. Ex[1016] ¶¶126-134. The only reference to the term “opportunity” in the specification is: “DPM's funds transfer pricing method uses maturity opportunity rates used in valuing each object's marginal use or source of internal funds.” Ex[1001] 7:61-64; Ex[1016] ¶¶127-129. Additionally, Claim 8 says: “wherein the opportunity values are based on matched maturity funds transfer pricing theory.” Ex[1001] 29:41-44.

Transfer pricing theory was well-known, as described by at least six references incorporated into the Patent:

- *Controversies on the Theory of the Firm, Overhead Allocation, and Transfer Pricing*
- *The Transfer Pricing Problem*
- *Transfer Pricing*
- *Internal Transfer Pricing of Bank Funds*
- *Transfer Pricing: Economic, Managerial, and Accounting Principles*
- *International Intracorporate Pricing*

Ex[1001] 3:16-31. The specification further admits that Transfer Pricing was well-known: “**common name** for this approach to valuing is know[n] as ‘Matched Maturity Funds Transfer Pricing.’” Ex[1001] 8:43-47.

Calculating opportunity values based on transfer pricing was conventional. Ex[1013] 910-916; Ex[1016] ¶¶126-134. *Mabberley* describes the “calculation of the cost of funds and earnings credit” using interest rates applied to “balances by pool, activity, responsibility centre, product, or customer.” Ex[1008] 95; Ex[1016] ¶129.

Additionally, Sections VII.B.1(iv), VII.C.1(iv), and VII.D.1(iv) describe prior art that calculates opportunity values and funds transfer pricing. Ex[1005] 175; Ex[1016] ¶¶126-134, 255-260, 417-423, 473-478.

“each object being measured”

This claim language does not add an inventive concept. Ex[1016] ¶¶131-133. The “object being measured” can be 1) a seat, policy, or account object, or 2) a customer, product, or organization. Ex[1001] 6:57-61, 7:18-37, Figs. 3-4. Calculating Transfer Pricing at a product (seat, policy, or account) and organizational level, to the extent not the abstract idea, was well-known as described by references cited in the specification. *See* Ex[1001] 3:16-31; Ex[1013]. Further, Sections VII.B.1(iv), VII.C.1(iv), and VII.D.1(iv) show that applying

transfer pricing at various levels of granularity within the organization was well-known.

Additionally, consolidating/aggregating costs and revenues to an “object” was well-known. Ex[1016] ¶¶126-134. *Horngren* describes a “cost object” as “anything for which a separate measurement of costs is desired. Examples include a product, service, project, customer, brand, category, activity, department, and program.” Ex[1013] 27-32, 46; Ex[1016] ¶132. *Blain* describes a “cost or profit object” as “a convenient conceptual destination that can appear in the accounts with accrued costs or revenues,” and as a method that “enables an accurate system of accounting that will help you control the value-adding business processes of your company.” Ex[1006] 273, 278; Ex[1016] ¶¶133, 417-423.

(v) *Element 1[d]*

As explained above (1[b], 1[c]), the claimed relational database was conventional. §§VII.A.3(iii)-(iv); Ex[1016] ¶¶122-133.

“establishing ... rules for processing the prepared information”

Establishing rules for processing information is an essential component of relational databases, and a fundamental feature of any RDBMS implementing a relational language (*e.g.*, structured query language). Ex[1004] 9-13, 77-79, 95-108; Ex[1014] 79-99, 110-127; Ex[1016] ¶¶135-142. Relational databases are based on the “relational model” defined by an entity-relationship of

tables and the data stored therein. Ex[1014] 52-58; Ex[1016] ¶¶136-138. To create a relational database, an entity-relationship must be defined. Ex[1014] 52-58; Ex[1016] ¶¶136-138. Defining the entity-relationship requires establishing rules in the relational database that define how the entities interrelate and how information can be inserted or used in a database, usually using a data definition file. Ex[1004] 49-56; Ex[1014] 52-58; Ex[1016] ¶¶136-138.

In the SQL standard, used in many well-known database systems, many operations are defined to establish rules for selecting and processing information. See Ex[1004]; see also Ex[1014]. Specifically, SQL provides the capability to define, in the database, stored procedures (executable programmatic logic), stored functions, macros, triggers, views, and indexes. Ex[1004] 15-17, 212; Ex[1014] 52-56, 112-123, 453, 469-470. These functions provide the capability to establish rules within the database for processing information. Ex[1004]; Ex[1014]. SQL also permits selecting various objects in the database through the SELECT query function. Ex[1004] 78; Ex[1016] ¶138.

Blain discloses calculating profitability using rules, explaining: “cost data are allocated according to rules which are under your control” and that the system can “[a]llocate, or set up rules to allocate, activity costs.” Ex[1006] 284, 311; Ex[1016] ¶¶424-431. *SAP-IS-B* discloses calculating profitability using “costing rules, regulatory reporting rules, [and] risk management rules.” Ex[1007] 27; Ex[1016] ¶¶480-486. *SAP-IS-B* also discloses that “conversion

rules” are “maintained by the user” and the “rules support the conversion of data structures from the external (operational) systems to the IS-B data structures.” Ex[1007] 87; Ex[1016] ¶¶480-486.

“performing a profit calculus”

“[P]erforming a profit calculus” is a core part of the abstract idea, and fails to provide an inventive concept to Claim 1. Calculating profit values using a relational database was well-known and was a conventional use of a relational database. See Ex[1006]; see also Ex[1007]; Ex[1016] ¶¶140-142.

SAP-IS-B discloses that the “Bank Profitability Analysis” is performed for any “customer group, product, risk class, branch” based on user-assigned rules. Ex[1007] 60; Ex[1016] ¶¶480-486. Blain discloses that a user can “display a business-oriented profit and loss analysis” that is “scrutinized down to the details of the individual transactions,” where the “cost data are allocated according to rules which are under your control.” Ex[1006] 311; Ex[1016] ¶¶424-431.

(vi) *Element 1[e]*

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

SAP-IS-B discloses independently calculating marginal values of profit: “all selected costing methods are analyzed simultaneously.” Ex[1007] 36; Ex[1016] ¶¶487-492. *SAP-IS-B* also discloses that “[w]ithin the Cost Accounting module, various cost accounting systems can run in parallel” and that “you can directly assign those revenues and costs which cannot be assigned to single transactions to profitability segments.” Ex[1007] 10, 60; Ex[1016] ¶¶487-492. *Blain* discloses that the “system automatically updates a subtotal of a balance sheet account for every business transaction.” Ex[1006] 221; Ex[1016] ¶¶432-438.

“marginal value of profit”

Calculating “at least one marginal value of profit” is also core to the abstract idea, and well-known in the art. Ex[1016] ¶145. The patent defines “marginal value of profit” in multiple ways, including by calculating “provisioning (P),” “net interest (NI), other revenue (OR) and direct expense (DE).” Ex[1001] Claims 3-4. The prosecution history also states that “methods of marginal pricing” include “activity based costing or funds transfer pricing.” Ex[1015] 256. But funds transfer pricing was well-known in the art at the time. Ex[1016] ¶145. Activity-based costing is explained in detail in the prior art, by at least *E&Y*, *Mabberley*, and *Blain*. Ex[1005] 123-140; see Ex[1008] (entitled “Activity-based Costing in Financial Institutions”); Ex[1006] 284-298; Ex[1016] ¶145. The prior art, as described in Sections VII.B.1(vi), VII.C.1(vi), and VII.D.1(vi), also demonstrate

that calculating values for provisioning, net interest, other revenue, and direct expense at a product level was well-known and routine in the art. Ex[1016]

¶¶269-276, 432-438, 487-492. E&Y depicts calculating NI, OR, DE, and P for a customer object:

Figure 5-6—Sample Customer Profitability

	Total	Lines and Commitments	Loans	Fee Services	Deposits
Interest Income	\$50		\$50		
Interest Expense	(10)				\$(10)
Credit/(Charge) for Funds	(10)		(40)		30
Net Interest Income	30		10		20
Provision for Loan Losses	(1)		(1)		
Net Interest Income after Provisions for Loan Losses	29		9		20
Waived Fees	(29)			\$(29)	
Other Income	42	\$10	2	30	
Noninterest Expense	(39)	(2)	(1)	(35)	(1)
Contribution	3	<u>\$ 8</u>	<u>\$10</u>	<u>\$(34)</u>	<u>\$19</u>
Overhead Expense	(4)				
Income before Taxes	<u>\$(1)</u>				

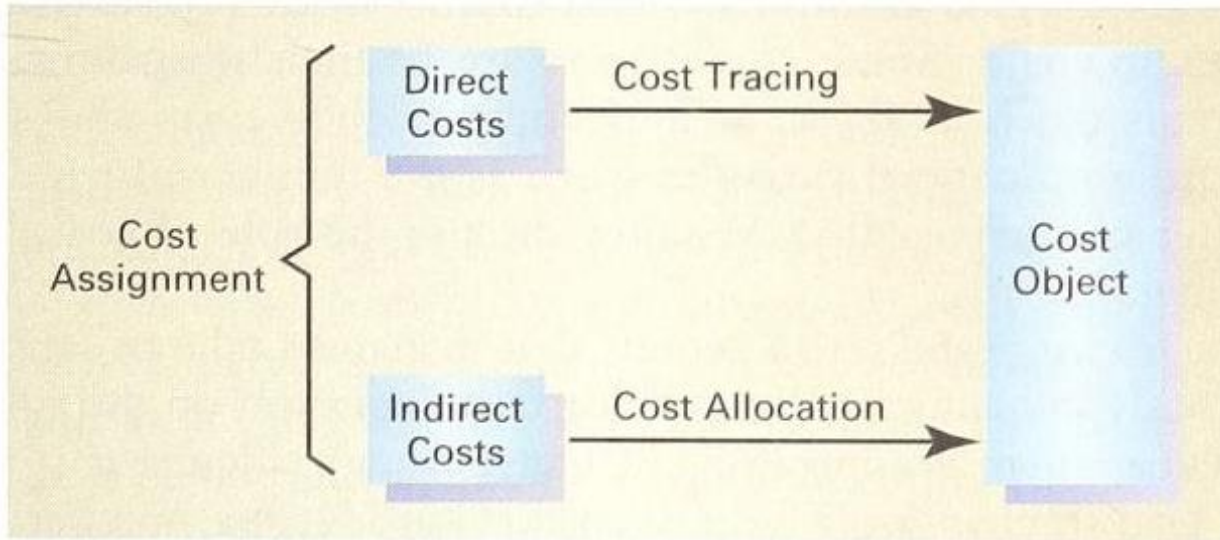
Ex[1005] 45; Ex[1016] ¶¶269-276.

(vii) *Element 1[f]*

To the extent this is not part of the core abstract idea, as described above, calculating a marginal value of profit was well known, and simply combining this value in a conventional fashion does not provide an inventive step.

§§VII.A.3(vi); Ex[1005] 42-45; Ex[1016] ¶¶147-151.

Horngren depicts combining a marginal value of profit (*i.e.*, direct costs, indirect costs) into a cost object used for calculating object level profitability, as depicted below:



Ex[1013] 27; Ex[1016] ¶148.

E&Y depicts combining a marginal value of profit (*i.e.*, net interest income, provision for loan losses, other income, direct expense) at a product, customer, or organization level. Ex[1005] 42-45; Ex[1016] ¶¶147-150, 277-282. *SAP-IS-B* also depicts combining a marginal value of profit for every transaction. Ex[1007] 61-63; Ex[1016] ¶¶149, 493-498.

As described for element 1[c], measuring profit at granular levels (a product, customer, or organization level) was well-known. §VII.A.3(iv). Combining a marginal value of profit to create a measure of profitability at different granular levels was also well-known. Ex[1005] 42-45; Ex[1016] ¶¶147-151.

The particular combination of elements in claim 1 also fails to provide an inventive concept, as they merely combine conventional components in a conventional manner to implement the abstract idea. Ex[1016] ¶151.

Since none of the elements provide an inventive concept, Claim 1 fails to provide “significantly more” than the abstract idea of “calculating object level profitability.” Using the generic technologies of a computer, a relational database, and an RDBMS to calculate the well-known accounting concepts of opportunity values and marginal values of profit at various levels of granularity fails to transform Claim 1 into patent-eligible subject matter.

4. Elements recited in the dependent claims do not alter the analysis.

The elements of the dependent claims are also directed to abstract ideas and recite no “inventive concept” to save them. Instead, the recitations in the claims add nothing more than insignificant post-solution activity. *Apple*, at *8-10; *Mayo*, at 1298 (“insignificant post-solution activity” is not enough).

Claims 2, 4-7, and 25-30 simply recite formulas or additional steps for calculating profit that are themselves part of the abstract idea. *Flook* holds that “a claim for an improved method of calculation, even when tied to a specific end use,

is unpatentable subject matter under §101.” *Parker v. Flook*, 437 U.S. 584, 595 n.8 (1978).

Additionally, Claims 2, 4-7, and 25-30 simply further specify the calculations depicted in Claim 1, and fail to provide anything more the abstract idea of “collecting and analyzing information.” *Electric Power Group*, at 135.

(i) *Claim 2*

Claim 2 says the generic “relational database” comprises a “structured query language (SQL)”; this was well-known. Claim 2 does not improve on SQL or relational databases; it just uses them. Ex[1016] ¶¶155-158. Relational databases were well-known in the art (VII.A.3). See Ex[1004]; see also Ex[1014]. Using SQL was also well-known, routine and conventional, having been adopted as an official standard in the U.S. by ANSI in 1982, and internationally by ISO in 1987. Ex[1004] 3; Ex[1016] ¶¶155-158. In fact, SQL was so commonplace that the only reference to SQL within the specification is in the title of a reference. Ex[1001] 2:53-55; see Ex[1004]; Ex[1016] ¶¶155-158.

Blain and *SAP-IS-B* both expressly disclose using SQL with a relational database to calculate object level profitability. Ex[1006] 36, 57-58, 181, 1060; Ex[1007] 23, 58-61; Ex[1016] ¶¶155-158, 444-446, 499-501.

(ii) *Claim 4*

Claim 4 fails to provide an inventive step in calculating a “marginal value of profit” as “provisioning.” Ex[1016] ¶¶173-175. The Patent defines “Provision – Adjusting current profit for expected future value changes is known as ‘actuarial’ provisioning. ***The technique is well known by the financial industry's accounting practice.***” Ex[1001] 9:49-52. Thus, the Patent admits provisioning was well-known.

Provisioning for expected future outcomes was commonplace and often a requirement for regulatory compliance (*e.g.*, GAAP, IFRS). Ex[1018]; Ex[1016] ¶¶173-175, 219-233. For example, *Mabberley* describes calculating “provisions (loan loss, insurance claims, sovereign debt and other loss provisions),” and that “specific provisions are established at the product as well as customer level.” Ex[1008] 115, 131; Ex[1016] ¶174. *Horngren* describes calculating income tax provisions, spoilage provisions, and sales return provisions. Ex[1013] 42, 577, 662; Ex[1016] ¶174.

E&Y describes calculating a loan loss provision as “the total expected loss over the life of the portfolio” that “can be applied against business-unit and product level balances.” Ex[1005] 209, 212; Ex[1016] ¶¶175, 316-321. *SAP-IS-B* depicts calculating provisions including risk costs, minimum reserve costs, and deposit protection costs. Ex[1007] 33, 60-63, 88; Ex[1016] ¶¶175, 524-529.

(iii) *Claim 5*

Claim 5 describes the well-known routine task of calculating “indirect expense.” Ex[1016] ¶¶176-179. *Horngren* teaches that “[i]ndirect costs of a cost object are costs that are related to a particular cost object but cannot be traced to it” and “are allocated to the cost object using a cost allocation method.” Ex[1013] 27, 110, 458, 510; Ex[1016] ¶177. *Mabberley* says “[w]here full absorption costing is required, the indirect costs must also be allocated to products.” Ex[1008] 134; Ex[1016] ¶177.

E&Y explains that “[u]nder the full-absorption approach, fixed costs are included in the unit cost, as well as any indirect or overhead costs related to the particular organizational unit,” and that the indirect expense “can be used in reporting from any dimension, including product, branch, organizational, or customer profitability.” Ex[1005] 41, 86; Ex[1016] ¶178, 322-326. *SAP-IS-B* also discloses calculating “indirect costs” to “fully absorb the cost involved in a single transaction.” Ex[1007] 54-58, 63; Ex[1016] ¶178, 530-534.

(iv) *Claim 6*

Claim 6 recites the well-known simple calculation of adding NI and OR, and subtracting therefrom DE, P, and IE. Since calculating each of the values was well-known, the simple combination in a conventional fashion does not provide an inventive concept. Ex[1016] ¶¶180-182.

The calculation of Claim 6 is depicted by *E&Y*, where NI (“net interest income”) and OR (“other income”) are added together, and DE (“noninterest income”), P (“provision for loan losses”), and IE (“overhead expense”) are subtracted therefrom. Ex[1005] 42-45; Ex[1016] ¶¶181, 327-332. This calculation is also depicted in *SAP-IS-B*:

Interest income			
- Opportunity income			
= Interest terms contribution - active			
+ Commission income			
- Commission costs			
= Commission contribution (subtotal)			
= Contribution margin I			
- Standard unit costs			
- Standard cancellation costs			
- Equity capital costs			
= Contribution margin II			
- Indirect costs			
= Contribution margin III = market result			

Interest Income/Expense
± Opportunity Values (COF/VOF)
(± Equity Capital Costs)
Net Interest

+ Other Revenue

- Direct Expenses

- Direct Expenses

- Provisioning

- Indirect Expenses

Ex[1007] 63; Ex[1016] ¶¶181, 535-537.

(v) *Claim 7*

Claim 7 recites the well-known tasks of adjusting profitability for “taxes and/or object economic value.” Ex[1016] ¶¶183-186. The ‘316 Patent

admits that object economic value calculation methods were well-known, since they were included in regulatory definitions and included in books on “Modern Portfolio Theory.” Ex[1001] 8:56-64; Ex[1016] ¶183.

Wells depicts adjusting profitability for each business group for taxes. Ex[1018] 10-11; Ex[1016] ¶184. *Wells* also describes adjusting profitability for object economic value, explaining that “[e]quity is allocated to the lines of business based on an assessment of the inherent risk associated with each business so that the returns on allocated equity are on a risk-adjusted basis and comparable across business lines.” Ex[1018] 11; Ex[1016] ¶184. *Horngren* describes calculating object economic value by describing the calculation of “economic value added (EVA).” Ex[1013] 937; Ex[1016] ¶184.

E&Y discloses the ‘316 Patent’s method of using a “single, average tax rate when taxes are included in profitability reports.” Ex[1005] 73; Ex[1016] ¶¶185, 333-339. *E&Y* also discloses calculating object economic value by “allocate[ing] shareholder equity strictly by asset percentage” in order to calculate the “ROE for business units, products, or customers.” Ex[1005] 14-15; Ex[1016] ¶¶185, 333-339.

(vi) *Claim 25*

Claim 25 recites calculating indirect expense based on apportioning some of the total indirect expense to an object, and then amortizing that

apportioned indirect expense based on the amortization rule and life of the object. Ex[1016] ¶¶215-218. The apportionment is based the function $F(IE_k)(o_i)$. But "[a]ny apportionment function is allowed" (Ex[1001] 19:53-56) as long as it results in a ratio of Indirect Expense for an object. $F(IE_k)(o_i)$ can apportion based on a simple **count** (1/total number of objects); **balance** (object balance/the sum of **balances** for objects); event count, revenue, or any other function the user defines. Ex[1001] 19:64-22:1. The Patent describes the purpose of amortization, explaining that: "Since DPM is designed to **mirror a financial statement's profit measure** it must support deferral and accrual accounting principles. **Amortization methods are included in DPM to reflect these GAAP concepts.**" Ex[1001] 9:22-25; Ex[1016] ¶215. This admits that the amortization methods of Claim 25 were well-known and reflected in regulatory accounting practices.

Horngren describes calculating indirect expense, apportioning indirect expenses according to expense pools, and adjusting for the amount of the overall indirect expense incurred in this time period. Ex[1013] 100-101; Ex[1016] ¶216. *E&Y* also describes the indirect expense calculation of Claim 25. §VII.B.7; Ex[1005] 74-76; Ex[1016] ¶¶217, 377-381;.

(vii) *Claim 26*

Claim 26 recites "calculating provisioning (P) of each object" by multiplying the provisioning allocated to a provision group ("PG") by an

apportionment based on the balance of the object as a percentage of the balance of the group. Ex[1016] ¶¶219-225.³ The airline example of the patent presents this formula as:

$$P(\textit{seat}) = \textit{Flight: InsurancePremium} * \frac{1}{\textit{totalSeatsOnPlane}}$$

Ex[1001] 26:42-43. This formula simply divides a flight’s insurance premium by the total seats on the plane to determine insurance provision per seat. Ex[1016] ¶¶219-225.

Basel I Accords required financial institutions to calculate provisions using provision groups. Ex[1020] 18-19, 21-26. *Wells* depicts this in its calculation of a provision for loan losses. Ex[1018] 10; Ex[1016] ¶222. *Horngren* describes calculating a return provision applied to a product based on its share of gross revenue. Ex[1013] 577; Ex[1016] ¶223. *E&Y* describes calculating a “periodic provision as a percentage of outstanding balances.” Ex[1005] 209; Ex[1016] ¶¶224, 0-386. *E&Y* also describes calculating “loan loss provisions” for the “appropriate center, product, or customer.” Ex[1005] 77; Ex[1016] ¶¶224, 0-386.

³ “RPG(o_i)” in Claims 26 and 27 does not appear anywhere in the specification, claims or figures. Ex[1016] ¶¶219-225, 226-229.

(viii) *Claim 27*

Claim 27 recites calculating provisioning by multiplying the provisioning allocated to a provision group ($PG(o_i)$) by an apportionment based on the balance and adjustment factor of an object as a percentage of the balance and adjustment factor of the group $(\frac{Balance(o_i) * RF(o_i)}{\sum Balance(o_k) * RF(o_k)})$.
Ex[1016] ¶¶226-229.

Basel I Accords required financial institutions to calculate provisions using risk-weighted provision groups. Ex[1020] 18-19, 21-26. *E&Y* discloses calculating a provision based on an apportionment of a provision group and an adjustment factor. Ex[1005] 77; Ex[1016] ¶¶228, 0-390. *E&Y* also discloses using the total expected losses ($PG(o_i)$) multiplied by the balances and by risk rating or a risk grade $(\frac{Balance(o_i) * RF(o_i)}{\sum Balance(o_k) * RF(o_k)})$. Ex[1005] 211; Ex[1016] ¶¶228, 0-390.

(ix) *Claim 28*

Claim 28 recites calculating provisioning by multiplying the exposure, probability, and expected value adjustment for an object, and dividing that value by the expected number of reporting periods during the life of the object. Ex[1016] ¶¶230-233. The patent fails to describe what “ $Exposure(o_i)$ ” and

“Expected Value Adjustment(o_i)” mean, so according to Dr. Weber “Exposure(o_i)” is assumed to be the expected provision for the object o_i and “Expected Value Adjustment(o_i)” is a risk factor. See Ex[1001]; Ex[1016] ¶230.

E&Y describes various methods of calculating provisioning, including a method using Markov Chains called Loan Migration to calculate provisions and required reserves as a function of potential losses, probability of those losses, risk factors, and time. Ex[1005] 206, 208-210; Ex[1016] ¶¶232, 0-395. *E&Y* discloses calculating a loan loss provision of a portfolio (o_i) based on the balance of the portfolio (Exposure(o_i)), expected loss over the life of the portfolio (Pr(o_i)), the current risk rating (Expected Adjustment Value(o_i)), and the period of time in which the loss can be expected to occur ($1/L_i$). Ex[1005] 206-210; Ex[1016] ¶¶232, 0-395.

(x) *Claim 29*

Claim 29 fails to provide an inventive concept beyond the well-known abstract idea of “calculating object level profitability” by calculating the shareholder value added (“SVA”). Ex[1016] ¶¶234-238. SVA is described as “a method financial analysts use to adjust profit measures for risk. The idea is to subtract from the profit measure the cost of the equity required to support whatever object is being measured.” Ex[1001] 22:51-54. The specification further explains: “institutions will classify cohorts of risk and the risk cost equivalent as a

percentage of account balance or allocated equity (i.e., ‘Hurdles’).” Ex[1001] 24:57-59. Further, “ $\alpha(o_i)$, $\beta(o_i)$ are functions for a cohort of objects in which o_i is a member” and that the “cohort defined here represents a grouping of objects with similar risk characteristics, consistent with Modern Portfolio Theory and the Capital Asset Pricing Model.” Ex[1001] 24:44-50. This admits that the calculation of SVA was well-known in the art. Ex[1001] 14:30-41; Ex[1016] ¶234.

In the ‘316 Patent’s airline example, profit per seat was adjusted for “[e]conomic equity per average seat” times the “[c]ost of capital rate” as depicted:

$$\text{Calculate SHV}(\text{seat}) = \text{Profit}(\text{seat}) - (\text{Flight: risk_factor} * \text{eqrt})$$

Ex[1001] 28:28-32. The example does not provide any value for alpha and the specification does not provide any description of what alpha or beta represent other than their consistency with CAPM. Ex[1016] ¶235. Additionally, the specification conflates the “cost of capital rate” with the “equity rate” in presenting the airline example. Ex[1016] ¶235.

The concept of adjusting profit by a required hurdle rate was a well-known concept in accounting practice. Ex[1016] ¶¶234-238. For example, *Horngren* explains that the “cost of equity capital is the opportunity cost to investors of not investing their capital in another investment that is similar in risk” and companies that have adjusted income for the cost of equity were found to

“have increased shareholder value.” Ex[1013] 937-938; Ex[1016] ¶236. *Horngren* further describes calculating a “required rate of return (RRR), which is the minimum acceptable rate of return ... that the organization could expect to receive elsewhere for an investment of comparable risk. This rate is also called the discount rate, hurdle rate, or (opportunity) cost of capital.” Ex[1013] 783; Ex[1016] ¶236. *Horngren* also teaches the simple tax calculation of Claim 29: “*NetIncome = OperatingIncome – IncomeTaxes.*” Ex[1013] 61.

E&Y discloses “determin[ing] the proper hurdle rate for each line of business” as “measured by its beta coefficient, based on the capital asset pricing model (CAPM)” for “maximizing shareholder value.” Ex[1005] 30, 224; Ex[1016] ¶¶237, 0-400. *E&Y* teaches the simple tax calculation of Claim 29 (§VII.B.6). Ex[1005] 73. Additionally, *Kimball* teaches the tax calculation of Claim 29 (§VII.F.1). Ex[1010] 18.

(xi) *Claim 30*

Claim 30 fails to provide an inventive concept by simply reciting the formula of Claim 6 and multiplying it by a tax rate. Ex[1016] ¶¶239-243. Calculation of taxes using the formula “1-tax_rate” was well-known and routine, and was required by the GAAP and IFRS accounting standards. Ex[1018] 10-11; Ex[1016] ¶¶239-243. Additionally, the formula for calculating a two-tier taxation

system is a simple mathematical derivation of the routine tax calculation (“1-tax_rate”) applied twice. Ex[1016] ¶¶239-243.

McKenzie discloses the two-tiered tax calculation of Claim 30 as:

$$\tau = \theta (1 - u) + u$$

Where:

- τ = total effective tax rate
- θ = first tax rate
- u = second tax rate.

Ex[1011] 3; Ex[1016] ¶240. This is the exact formula of Claim 30, and establishes that the formula was well-known in the art.

For example, Dr. Weber shows the simple calculation of multiplying a net income of \$100 with a first tax rate (10%) followed by a second tax rate (30%) resulting in an effective tax rate of 37%:

$$\$100 * (1 - tax_1) = \$100 * (1 - 0.10) = \$90$$

$$\$90 * (1 - tax_2) = \$90 * (1 - 0.30) = \$63$$

$$EffectiveTaxRate = 1 - \frac{\$63}{\$100} = 0.37 = 37\%$$

Ex[1016] ¶241. This results in the same value as the calculation used in Claim 30:

$$EffectiveTaxRate = (1 - tax_2) * (tax_1) + tax_2$$

$$EffectiveTaxRate = (1 - 0.30) * (0.10) + 0.30 = 0.37 = 37\%$$

Ex[1016] ¶241. The calculation of the two-tier tax rate of Claim 30 is a simple mathematical derivation of the conventional practice of multiplying a value by a first tax rate followed by a second tax rate. Ex[1016] ¶242.

B. Grounds 2-3: Claims 2, 4-7, and 25-29 are Anticipated, and Claims 2, 4-7, and 25-30 are Rendered Obvious, by *E&Y*

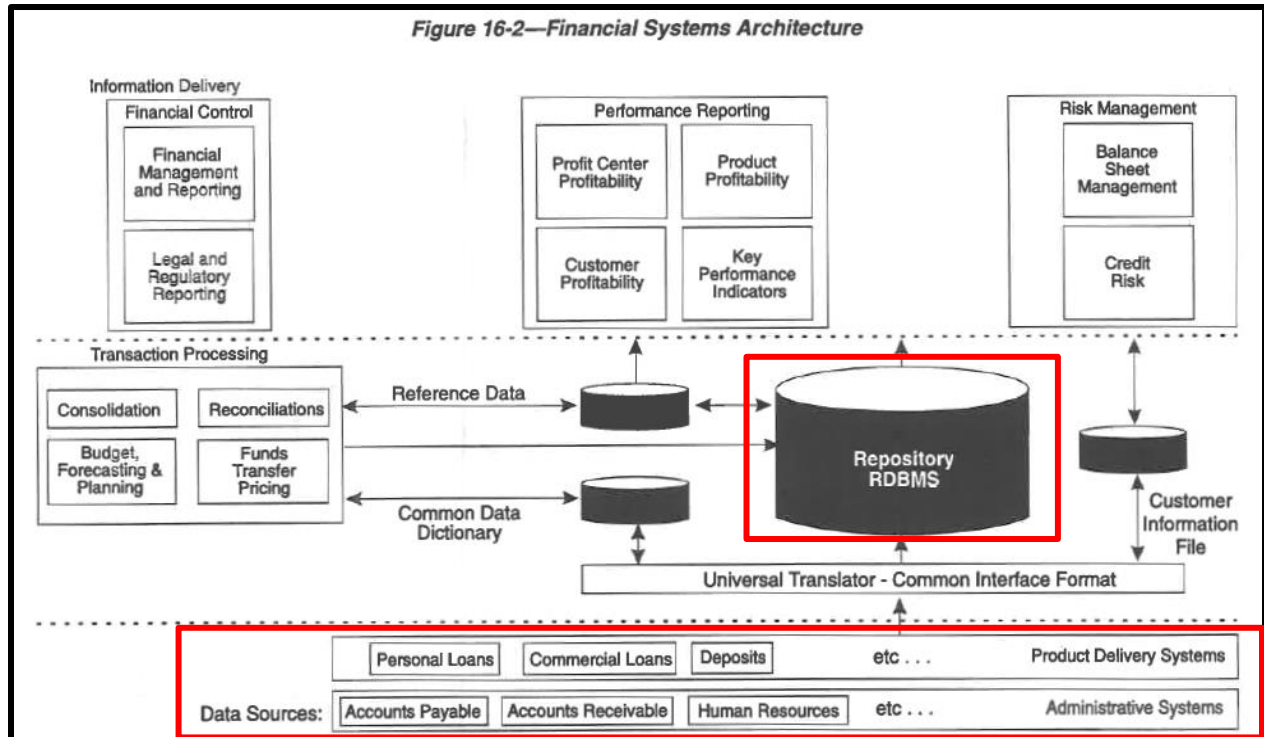
1. Independent Claim 1 (from which all claims depend)

(i) *Element 1[preamble]*

If limiting, the preamble is taught by *E&Y*. Ex[1016] ¶¶114, 247. *E&Y* uses an RDBMS to calculate profitability (VII.B.1(ii)-VII.B.1(v)) and using an RDBMS would have been an obvious way to implement *E&Y*. Ex[1005]; Ex[1016] ¶¶115-142, 248-256.

(ii) *Element 1[a]*

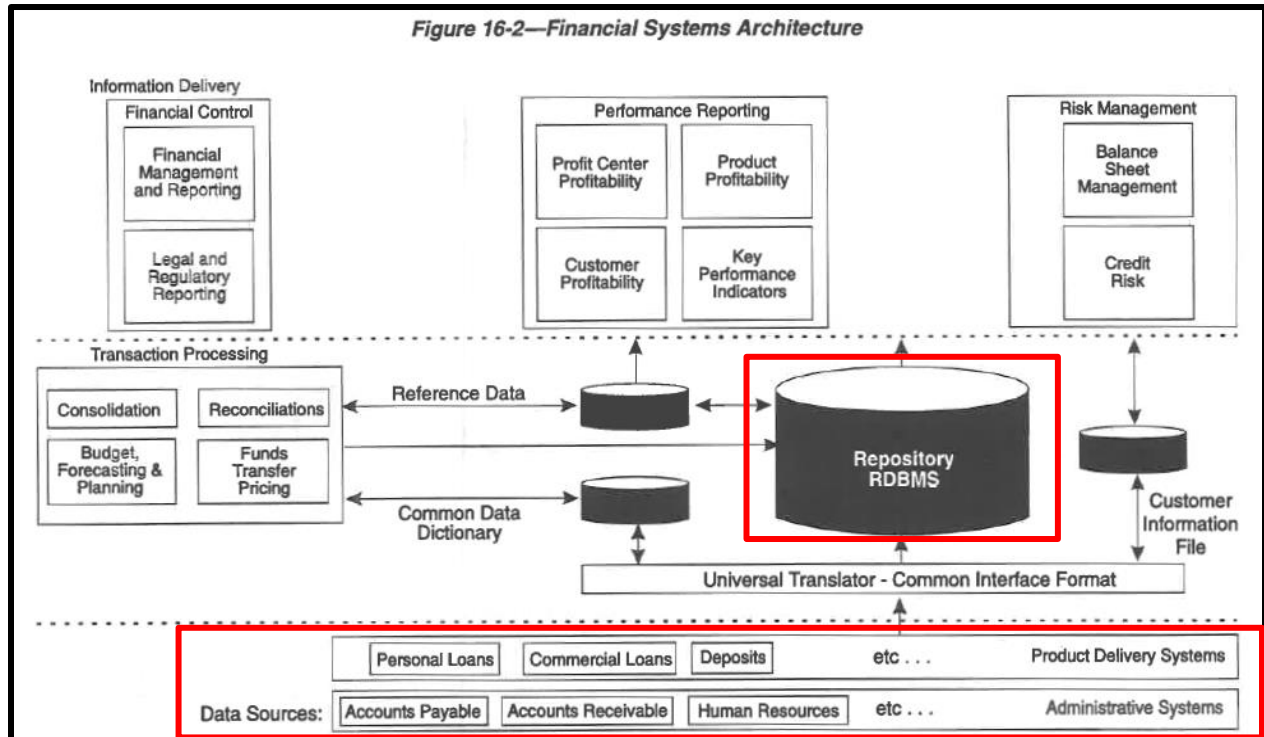
E&Y discloses element 1[a] by teaching “relational databases” which “stor[e] financial and nonfinancial data on products” and report “data on each component of total profit.” Ex[1005] 29, 183; Ex[1016] ¶¶248-252. A “repository database” is “used to house the results of transfer pricing calculations, provide the basis for all allocations, and prepare detailed performance measurement reports.” Ex[1005] 256. *E&Y*’s database is shown below:



Ex[1005] 275; Ex[1016] ¶249-250. The database is also “computerized”; data is “acquired, processed, reported, and stored” on a “desktop” or “larger departmental server[s] or mainframe computers.” Ex[1005] 270.

(iii) *Element 1[b]*

E&Y discloses element 1[b]. Ex[1005] 183, 275-277; Ex[1016] ¶¶253-254. E&Y teaches using a “relational database platform” for “aggregating data from many vertical, product-account-based databases into a single customer-oriented picture of behavior and profitability.” Ex[1005] 277, 288. E&Y’s “central data repository” consists of “a data repository that spans all the applications and houses all the common data elements” and is “built upon a relational database platform.” Ex[1005] 277. The Repository RDBMS interoperates with profit data sources:



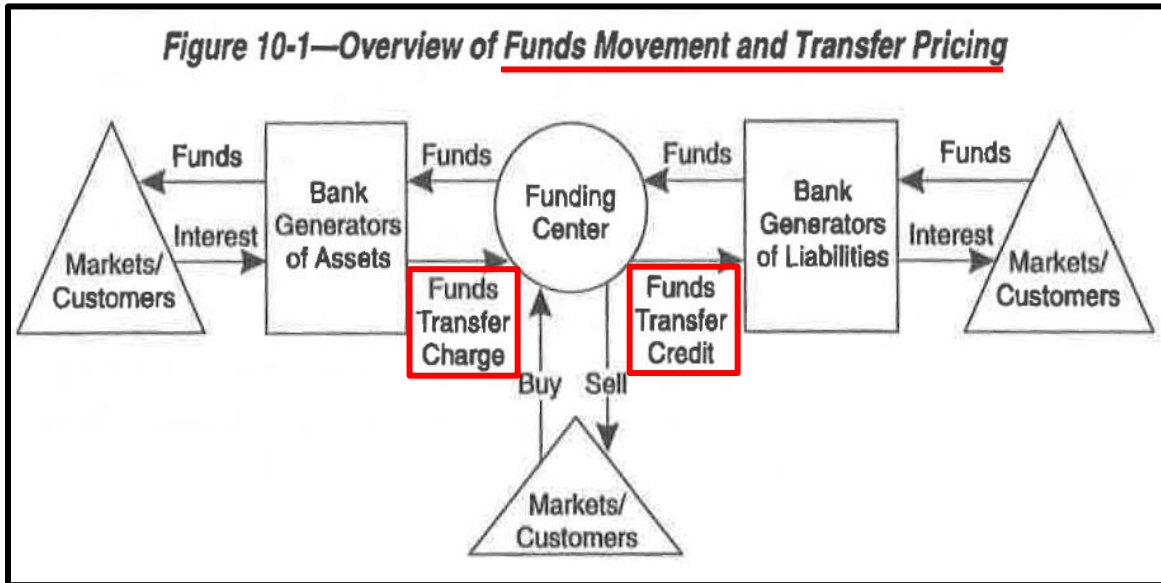
Ex[1005] 275.

(iv) *Element 1[c]*

E&Y discloses element 1[c]. Ex[1005] 125-126, 130, 175-177, 183, 274-277, 320; Ex[1016] ¶¶255-260. As shown above, *E&Y* stores profit information in the relational database. Ex[1005] 183, 275-277, 288. This profit information is prepared, including by calculating opportunity values. Ex[1016] ¶¶257-260. The Patent explains that calculating opportunity values is performed by calculation of transfer pricing, which *E&Y* shows. Ex[1001] 7:61-64; Ex[1016] ¶257.

E&Y teaches that “funds-transfer pricing represents a series of management-accounting mechanisms that measure *the value of opportunity costs*

of funds provided and used” in order to accurately determine “the profitability of business units, products, customers, etc.” Ex[1005] 175. E&Y discloses calculating opportunity values according to funds transfer pricing in “Chapter 10: Transfer Pricing of Funds,” including:



Ex[1005] 175-184.

E&Y also teaches that all costs, including opportunity costs, can be “attributed to one or more cost objects,” where a “cost object is any product, service, customer, market, distribution channel, project, etc., for which a unique cost measurement is desired.” Ex[1005] 125-126, Chapter 10(“Transfer Pricing”); Ex[1016] ¶259. Thus, E&Y teaches element 1[c] by disclosing the calculation of opportunity values for each object being measured, for access through a relational database. Ex[1016] ¶¶257-260.

(v) *Element 1[d]*

E&Y discloses element 1[d] in multiple ways. Ex[1005] 137-140, 239, 268-269, 276, 320; Ex[1016] ¶¶261-268. First, relational databases are defined by database tables and the relationship between those tables in an entity-relationship model. Ex[1016] ¶262. This model requires establishing rules in the database using the DDL language, as described by Dr. Weber, associated with SQL. Ex[1016] ¶262. Setting up a relational database satisfies “establishing, in the database, rules for processing prepared information.” Ex[1005] 275; Ex[1016] ¶262.

Second, *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. Ex[1005] 239, 268-269; 320; Ex[1016] ¶¶262-264. *E&Y* teaches an “assignment of cost elements to pools, and then to cost objects” using “the algorithms built into the Activity Based Costing system.” Ex[1005] 140; Ex[1016] ¶263. *E&Y* also teaches “developing and maintaining necessary algorithms for executing funds transfer pricing” and developing “cost and profitability information ... for any unit, product, customer or other cost object.” Ex[1005] 239, 320. As discussed throughout this petition, *E&Y* teaches dozens of methods for calculating profit using defined rules. The figure below is one example of *E&Y* performing a profit calculus:

Figure 8-6—Example: Payroll Units (Category One)

Step 1. Expenses Booked to Proper Account and Step 2. Aggregated by Cost Center and by Line Item	Step 3. Costs Mapped to Process Cost Pools	Step 4. Cost Driver Determined and Cost Assigned	Step 5. Costs Driven to Cost Object
Expenses for the Period MM/YY Cost Center 10XX: Payroll Direct Expenses Salaries \$42,000 Travel & Entertainment 6,000 Occupancy 9,000 Telephone 3,000 Supplies 3,000 Printing 1,500 Postage 1,500 Depreciation 2,000 Miscellaneous 4,000 Total Direct Expenses \$72,000 Charges from Category One Units Computer (usage × rate) \$6,000 Cafeteria (usage × rate) 1,080 Etc. (usage × rate) 2,000 Total Support Charges \$9,000 Total Expenses \$81,000	Process Pool A: Payroll Processing Activities determined to consume 80% of center's costs: $\\$81,000 \times .80 = \\$64,800$ Process Pool B: Investigation Activities determined to consume 20% of the center's costs: $\\$81,000 \times .20 = \\$16,200$ Total Expenses \$81,000	Process Pool A Driver: Number of Payroll Checks $\\$64,800 / 10,000 \text{ checks} = \\$6.48/\text{check}$ Process Pool B Driver: Number of Inquiries $(\\$16,200 / 150 \text{ inquiries} = \\$108/\text{inquiry})$ Total Expenses \$81,000	Support unit costs are attributed to other responsibility centers on the basis of the number of checks and inquiries that they generate.

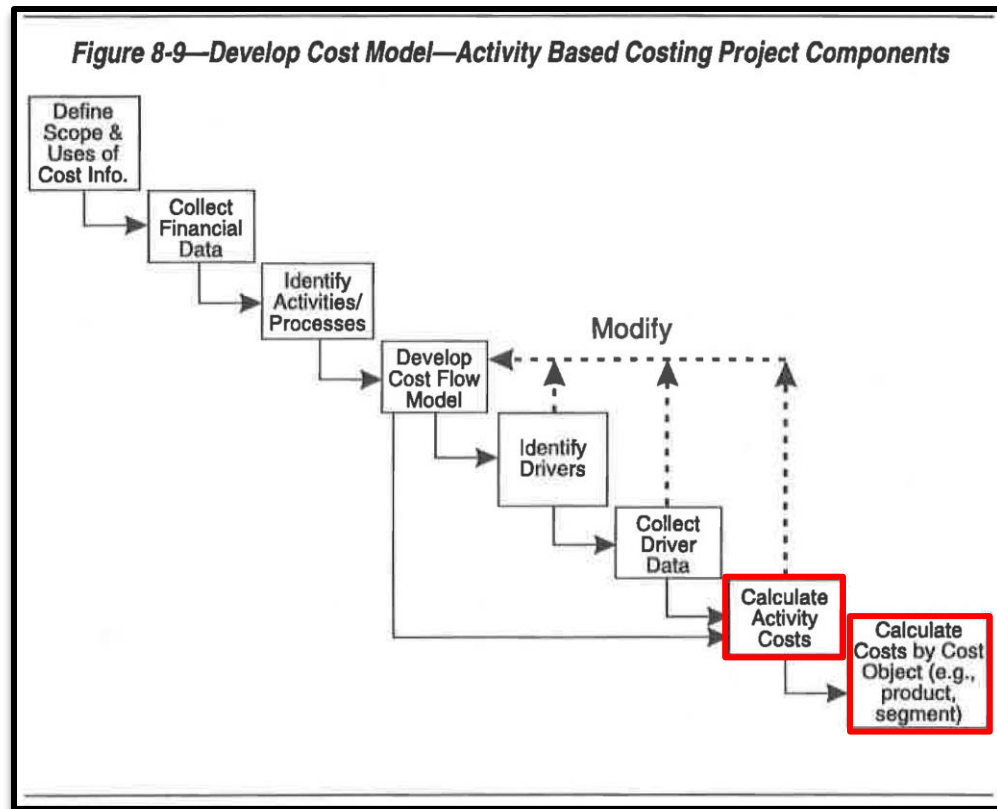
Ex[1005] 134; Ex[1016] ¶263. The rule for direct expense allocation above matches the “rule” from the ‘316 Patent airline example:

$$\text{Calculate DE1(seat)} = \text{tcc} * (1 / (\text{total no. of seats on plane}))$$

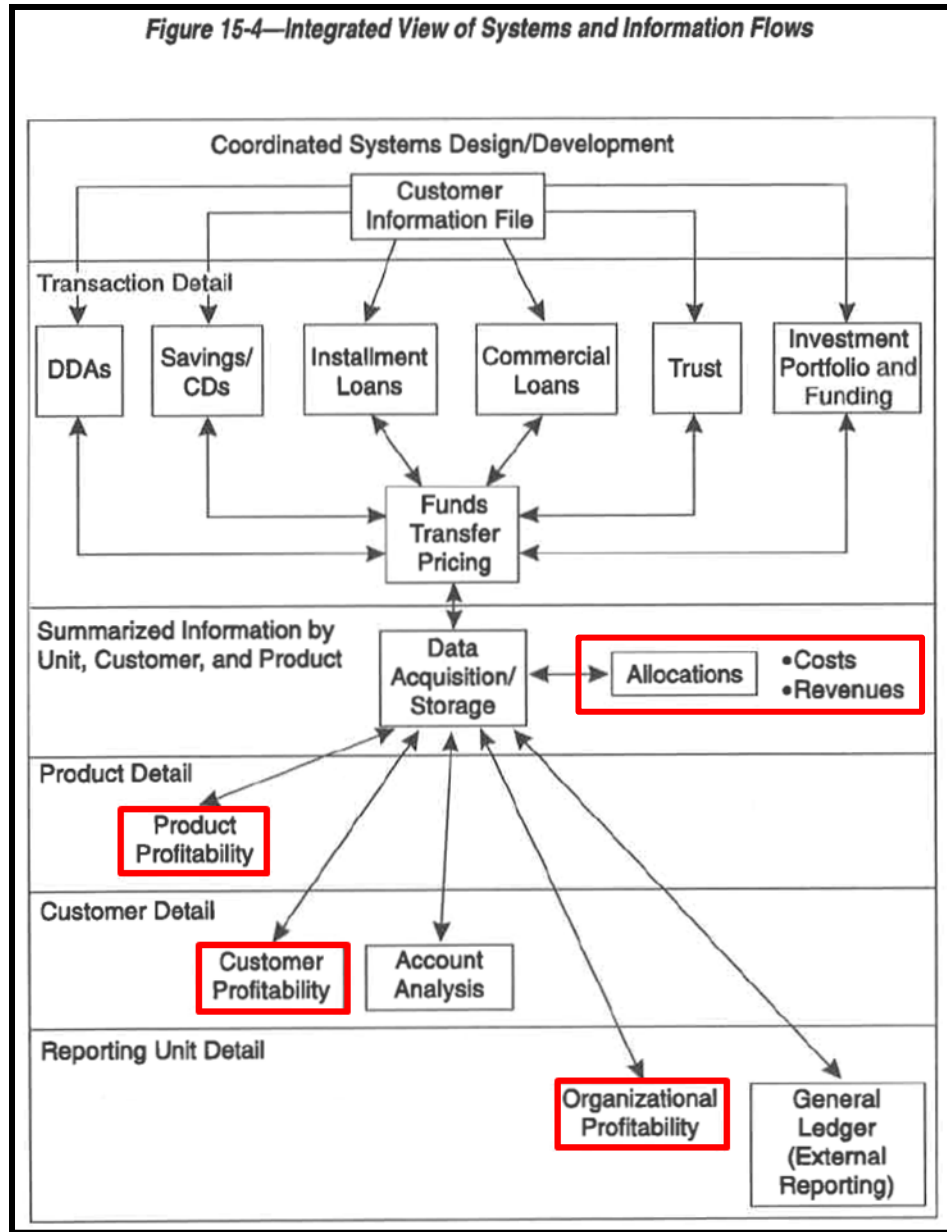
Ex[1001] 26:27; Ex[1016] ¶263.

E&Y also teaches “providing information necessary to select objects,” by teaching that “it is important not only to identify the data elements but also to identify their source” when performing profit calculations. Ex[1005] 256; Ex[1016] ¶265. The “identification can be either a fixed product code or, for more flexibility, a combination of one or more existing fields.” Ex[1005] 256; Ex[1016] ¶265.

E&Y teaches “performing a profit calculus” in the following figure:



Ex[1005] 139; Ex[1016] ¶267. *E&Y* teaches a profit model using identified cost drivers to allocate activity costs to cost objects. Ex[1005] 139; Ex[1016] ¶267. *E&Y* also teaches performing a profit calculus by generating profitability reports by product, customer and organization:



Ex[1005] 257; Ex[1016] ¶267.

As referenced in §VII.A.3(v), element 1[d] was well-known in the art. Ex[1016] ¶¶135-142. Thus, if it is argued that *E&Y* does not disclose “rules” it would also have been obvious for a POSITA to use the well-known elements of rules (such as SQL schema and other relationships between data), established in a

database, with the profit calculations of *E&Y* to perform the steps of element 1[d].
Ex[1016] ¶¶135-142, 261-268. Thus, *E&Y* also renders obvious element 1[d].

(vi) *Element 1[e]*

E&Y discloses element 1[e]. Ex[1005] 41-45, 56, 104, 129, 140, 183-184, 204, 253-258, 275-277, 283, 320; Ex[1016] ¶¶269-276. The Patent describes “marginal values of profit” as including any of: “provisioning (P),” “net interest (NI),” “other revenue (OR),” and/or “direct expense (DE).” Ex[1001] Claims 3-4.

E&Y teaches to “independently calculate” a marginal value of profit (direct expenses): “direct allocation approach consists of **concurrent, independent allocations** and distributes all expenses directly to the final beneficiaries.” Ex[1005] 104; Ex[1016] ¶¶269-270.

In *E&Y* “[m]arginal costs consist of expense items incurred as a result of adding one incremental item.” Ex[1005] 56. *E&Y* also shows calculating each of NI, OR, DE, and P (marginal values of profit) allocated to a customer object:

Figure 5-6—Sample Customer Profitability

	Total	Lines and Commitments	Loans	Fee Services	Deposits
Interest Income	\$50		\$50		
Interest Expense	(10)				\$(10)
Credit/(Charge) for Funds	(10)		(40)		30
Net Interest Income	30		10		20
Provision for Loan Losses	(1)		(1)		
Net Interest Income after Provisions for Loan Losses	29		9		20
Waived Fees	(29)			\$(29)	
Other Income	42	\$10	2	30	
Noninterest Expense	(39)	(2)	(1)	(35)	(1)
Contribution	3	<u>\$ 8</u>	<u>\$10</u>	<u>\$(34)</u>	<u>\$19</u>
Overhead Expense	(4)				
Income before Taxes	<u>\$ (1)</u>				

— Net Interest
— Provision
— Other Revenue
— Direct Expense

Ex[1005] 45. Each of these comprises calculating “at least one marginal value of profit” for an object. Ex[1016] ¶¶271-274.

E&Y teaches “using the established rules as applied to a selected set of prepared information” to make these calculations. Ex[1005] 129, 140, 239, 255-257, 320; Ex[1016] ¶275. As discussed above (VII.B.1(v)), *E&Y* discloses establishing rules to calculate profit values using prepared information stored in the database. Ex[1005] 129, 239, 255-257, 320. For example, *E&Y* calculates direct expenses as the “assignment of cost elements to pools, and then to cost objects” using “the algorithms built into the Activity Based Costing system.” Ex[1005] 140; Ex[1016] ¶275. The “assignment” and “the algorithms” represent rules for

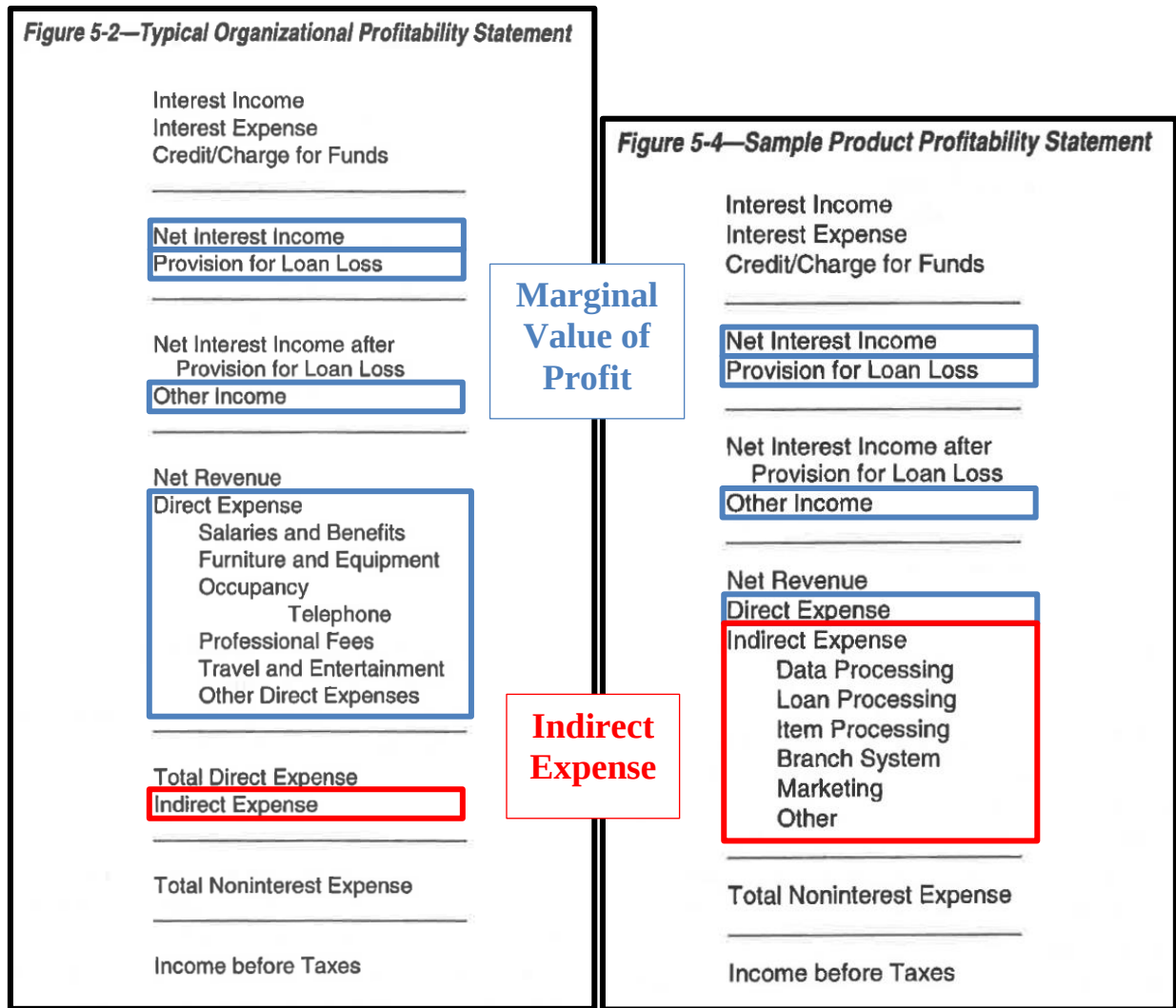
calculating profit. Ex[1016] ¶275. The “cost objects” and “pools” demonstrate that *E&Y*’s profit calculation uses a selected set of prepared information. *Id.*

The recitations of this element would also have been an obvious way to implement the teachings of *E&Y*, including its marginal value of profit calculations. For example, as discussed in §VII.A.3(vi), the use of relational databases, using rules to calculate profit values, and calculating marginal values of profit were known and predictable uses of a financial database to a POSITA. Ex[1016] ¶¶143-146. Thus, *E&Y* renders obvious element 1[e].

(vii) *Element 1[f]*

E&Y teaches this element. Ex[1005] 42-45, 253-258; Ex[1016] ¶¶277-283. As discussed in element 1[e], *E&Y* discloses calculating a marginal value of profit for each object. §§VII.B.1[e]; Ex[1005] 42-45, 253-258; Ex[1016] ¶¶269-276.

E&Y also teaches *combining* a marginal value of profit:



Ex[1005] 42-43. The figures above disclose combining marginal values of profit (blue) to create a measure of object level profitability (“Income before Taxes”).

Ex[1016] ¶278. The “object” in Figure 5-4 above is an individual product, while the “object” in Figure 5-2 is an organization. Ex[1016] ¶278.

E&Y also teaches element 1[f] in the following figure:

Figure 5-6—Sample Customer Profitability

	Total	Lines and Commitments	Loans	Fee Services	Deposits
Interest Income	\$50		\$50		
Interest Expense	(10)				\$(10)
Credit/(Charge) for Funds	(10)		(40)		30
Net Interest Income	30		10		20
Provision for Loan Losses	(1)	—	(1)	—	—
Net Interest Income after Provisions for Loan Losses	29		9		20
Waived Fees	(29)			\$(29)	
Other Income	42	\$10	2	30	
Noninterest Expense	(39)	(2)	(1)	(35)	(1)
Contribution	3	\$ 8	\$10	\$(34)	\$19
Overhead Expense	(4)				
Income before Taxes	<u>\$ (1)</u>				

Net Interest

Provisioning

Other Revenue

Direct & Indirect Expense

Indirect Expense

Ex[1005] 45. In this case the “object” is a “customer”, the marginal values of profit (blue) are combined to create a measure of object level profitability (“Income before Taxes”) for an individual customer. Ex[1016] ¶¶278-281. *E&Y* expressly teaches that all costs and profit calculations can be measured at the cost object, which *E&Y* describes as “any product, service, customer, market, distribution channel, project, etc., for which a unique cost measurement is desired.” Ex[1005] 125-129, 130-132, 134-140, 320-321; Ex[1016] ¶¶278-281.

2. Dependent Claim 2

E&Y anticipates and renders obvious Claim 2. Ex[1016] ¶¶284-287.

E&Y’s relational databases operate with “query functions.” Ex[1005] 29-32, 96,

183, 256, 277-279 (“ad hoc query functions”). While the *term* “SQL” is not used, a POSITA would have understood the “query functions” of *E&Y* as a structured query language. Ex[1016] ¶¶284-287.

E&Y also teaches the use of “end-user programming tools that can access and manipulate data” and “[o]pen system standards that enable the transfer of data between applications and hardware platforms” with “database gateway technology.” Ex[1005] 273-274. A POSITA would understand the programming tools, open system standards, and database gateway technologies as including at least a structured query language. Ex[1016] ¶¶284-287.

It would also be obvious to use SQL in *E&Y*. Ex[1016] ¶¶284-287. As discussed above (VII.A.4(i)), using SQL with a relational database was known and predicable. Ex[1016] ¶¶122-142. Using SQL would be obvious because SQL provides “ad hoc query functions” and the ability to “access and manipulate data” with and “[o]pen system standards that enable the transfer of data between applications and hardware platforms.” Ex[1016] ¶¶284-287.

3. Dependent Claim 4

E&Y anticipates and renders obvious Claim 4. Ex[1005] 45; Ex[1016] ¶¶316-321. As discussed in Claims 26-28, *E&Y* teaches several methods for calculating provisions. See VII.B.8-VII.B.10; Ex[1016] ¶¶382-395. The Patent provides examples of what may constitute provisioning: “expected loss

rates, reserve percentages, exposure factors, recovery rates, default probabilities and collection costs.” Ex[1001] 8:16-20.

E&Y teaches calculating a “loan loss provision,” a “major component of product and customer profitability,” by “allocat[ing] net charge-offs (gross charge-offs less recoveries) to the appropriate center, product, or customer.” Ex[1005] 76-77. The charge-offs represent a current allocation for expected future outcomes. Ex[1016] ¶318. *E&Y* depicts this loan loss provision:

Figure 5-6—Sample Customer Profitability

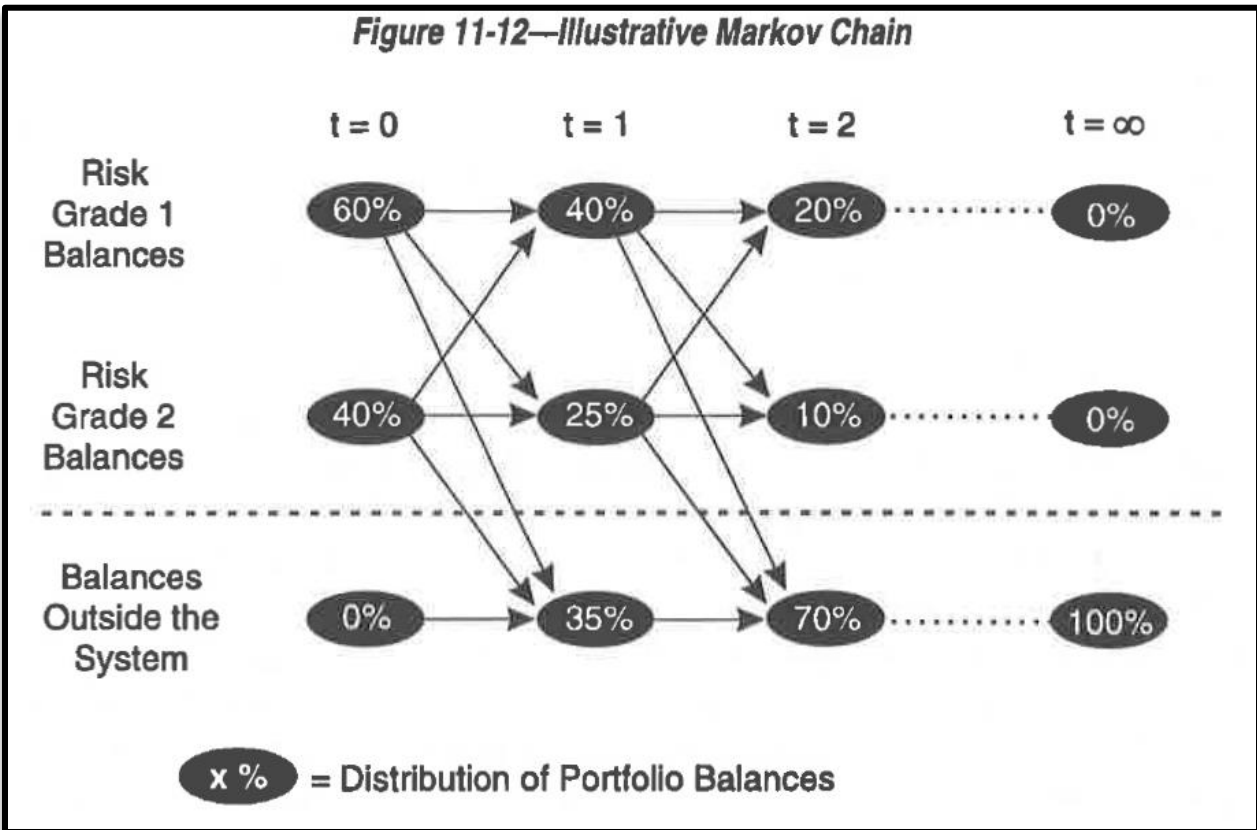
	Total	Lines and Commitments	Loans	Fee Services	Deposits
Interest Income	\$50		\$50		
Interest Expense	(10)				\$(10)
Credit/(Charge) for Funds	(10)		(40)		30
Net Interest Income	30	—	10	—	20
Provision for Loan Losses	(1)	—	(1)	—	—
Net Interest Income after Provisions for Loan Losses	29		9		20
Waived Fees	(29)			\$(29)	
Other Income	42	\$10	2	30	
Noninterest Expense	(39)	(2)	(1)	(35)	(1)
Contribution	3	<u>\$ 8</u>	<u>\$10</u>	<u>\$(34)</u>	<u>\$19</u>
Overhead Expense	(4)				
Income before Taxes	<u>\$(1)</u>				

Provision

Ex[1005] 45.

E&Y also describes calculating a loan loss provision by “amortiz[ing] the cost of a loss over the period of time in which the loss can be expected to

occur” using “Markov chain mathematics.” Ex[1005] 209; Ex[1016] ¶319. E&Y depicts the Markov chain process as:



Ex[1005] 209; Ex[1016] ¶319. Additionally, E&Y teaches other forms of provisioning for expected future events including reserve requirements for bank soundness and capital adequacy regulations for equity capital. Ex[1005] 205-212, 214. Thus, E&Y teaches the step of provisioning as recited in Claim 4.

4. Dependent Claim 5

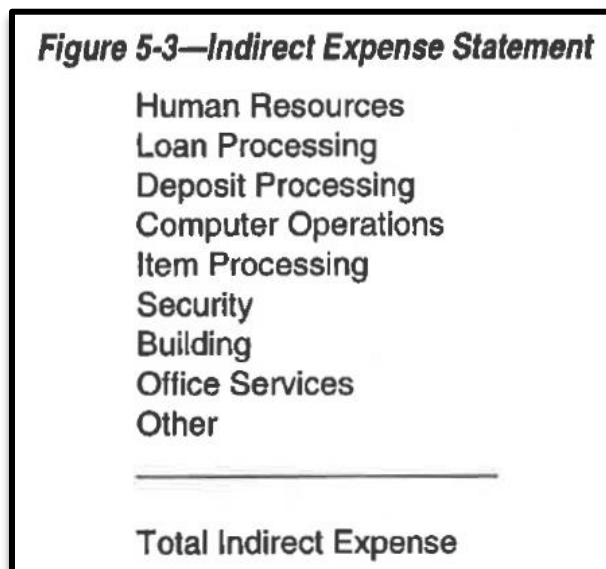
E&Y anticipates and renders obvious Claim 5. Ex[1005] 41-43, 53, 89; Ex[1016] ¶¶322-326. For example, E&Y discloses calculating indirect

expenses as an apportioned profit value adjustment for all non-object related resource consumption:

Figure 5-2—Typical Organizational Profitability Statement		Figure 5-4—Sample Product Profitability Statement	
Interest Income		Interest Income	
Interest Expense		Interest Expense	
Credit/Charge for Funds		Credit/Charge for Funds	
Net Interest Income		Net Interest Income	
Provision for Loan Loss		Provision for Loan Loss	
Net Interest Income after Provision for Loan Loss		Net Interest Income after Provision for Loan Loss	
Other Income		Other Income	
Net Revenue		Net Revenue	
Direct Expense		Direct Expense	
Salaries and Benefits		Indirect Expense	
Furniture and Equipment		Data Processing	
Occupancy		Loan Processing	
Telephone		Item Processing	
Professional Fees		Branch System	
Travel and Entertainment		Marketing	
Other Direct Expenses		Other	
Total Direct Expense		Total Noninterest Expense	
Indirect Expense			
Total Noninterest Expense		Income before Taxes	
Income before Taxes			

Ex[1005] 42-43. In addition to calculating indirect expense for each product or organization, *E&Y* teaches that “[u]nder the full-absorption approach” any “indirect or overhead costs related to a particular organizational unit” is “included in the unit cost.” Ex[1005] 86. “Full-absorption costing therefore results in the allocation of a base expense that equals the unit's total expense.” Ex[1005] 86.

E&Y provides a list of example expenses that may be included in the indirect expense report:

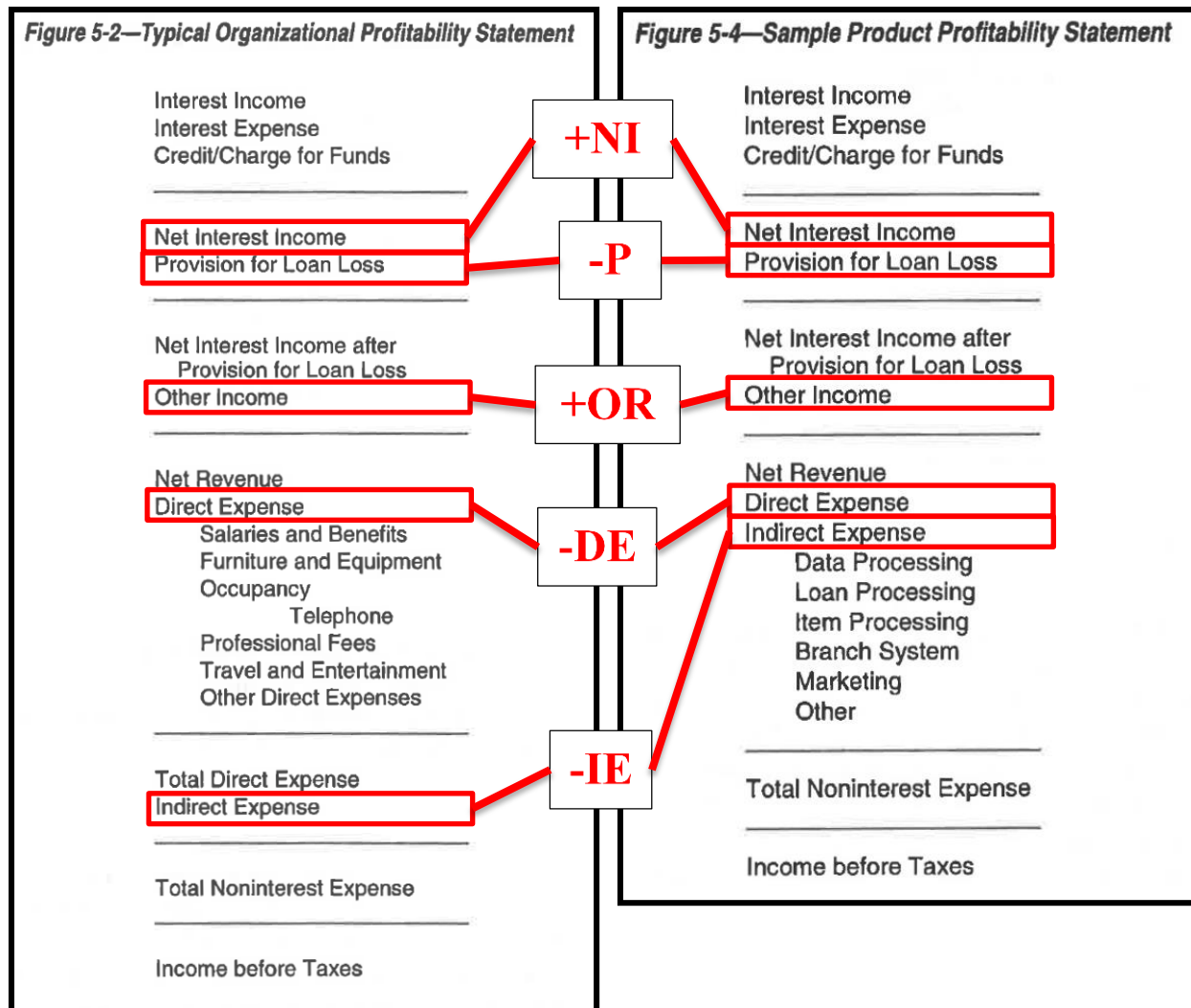


Ex[1005] 43. Such an indirect expense statement “can be used in reporting from any dimension, including product, branch, organizational, or customer profitability.

Ex[1005] 41. Thus, *E&Y* teaches calculating indirect expense according to Claim 5.

5. Dependent Claim 6

E&Y anticipates and renders obvious Claim 6. Ex[1005] 42-45, 253; Ex[1016] ¶¶327-332. *E&Y* teaches combining NI, OR, DE, P and IE at different granularities:



Ex[1005] 42-43.

E&Y teaches performing the same calculation for the customer object:

Figure 5-6—Sample Customer Profitability

	Total	Lines and Commitments	Loans	Fee Services	Deposits
Interest Income	\$50		\$50		
Interest Expense	(10)				\$(10)
Credit/(Charge) for Funds	(10)		(40)		30
Net Interest Income	30		10		20
Provision for Loan Losses	(1)		(1)		
Net Interest Income after Provisions for Loan Losses	29		9		20
Waived Fees	(29)			\$(29)	
Other Income	42	\$10	2	30	
Noninterest Expense	(39)	(2)	(1)	(35)	(1)
Contribution	3	\$ 8	\$10	\$(34)	\$19
Overhead Expense	(4)				
Income before Taxes	<u>\$(1)</u>				

+ Net Interest

- Provisioning

+ Other Revenue

- Direct &
- Indirect Expense

- Indirect Expense

Ex[1005] 45. E&Y also performs the same calculations for the organization object:

Figure 15-1—Sample Organization Profitability

Interest Income	\$3,000
Interest Expense	(6,000)
Credit/(Charge) for Funds	5,000
Net Interest Income	2,000
Provision for Loan Losses	200
Interest Income after Provision for Loan Losses	1,800
Other Income	300
Net Revenues	2,100
Operating Expense	850
Operating Income	\$1,250
Overhead	90
Income before Taxes	\$1,160

Ex[1005] 253. In these figures, *E&Y* shows the claim’s calculation at an organization, customer, and product level. Ex[1016] ¶¶327-332.

6. Dependent Claim 7

E&Y anticipates and renders obvious Claim 7. Ex[1005] 73, 176, 267; Ex[1016] ¶¶333-339. Claim 7 requires adjusting the measure for object level profitability for “taxes **and/or** object economic value.” Either will do.

E&Y teaches adjusting the profitability calculation for taxes: “[b]ecause tax rates vary by country, state, and city, calculation of a tax effect should reflect the differences.” Ex[1005] 73. *E&Y* further teaches that many

institutions “use a single, average tax rate when taxes are included in the profitability report.” Ex[1005] 73; Ex[1016] ¶¶333-339.

E&Y also teaches adjusting the profitability calculation for object economic value. Ex[1016] ¶¶333-339. The Patent defines “object economic value” as an “equity allocation to the object level” that can be calculated using “simple ratios; regulatory definitions; economic allocations based on econometric modeling (see book on Modern Portfolio Theory) methodologies; or, as statistically defined allocations” – admitting the concept was known. Ex[1001] 8:56-64. As described in relation to Claim 29, *E&Y* discloses multiple ways of incorporating equity allocations into the cost object. §VII.B.11. For example, *E&Y* teaches using regulatory requirements, market comparables, and cost of capital hurdle rates to measure object economic value. Ex[1005] 14-15; Ex[1016] ¶¶333-339, 0-400.

7. Dependent Claim 25

E&Y discloses amortizing indirect expenses apportioned to objects. Ex[1005] 72-76; Ex[1016] ¶¶377-381. For example, *E&Y* discloses amortizing a new product’s development costs, explaining: “[i]n management accounting, a new product's profitability may be projected by *capturing the cost of development separately and amortizing it over the product's life expectancy.*” Ex[1005] 326; Ex[1016] ¶¶378-379. Here, *E&Y* discloses separating the cost of a particular

product's development $(\frac{F(IE_k)(o_i)}{\sum F(IE_k)(o_j)})$ from the overall product development costs (IE_k) and amortizing that over the product's life expectancy ($AM_1(L,R)$). Ex[1016] ¶379. *E&Y* continues with an example of splitting R&D expenses based on a per item expenditure amortized over the expected life:

Figure 6-7—Unit Costs for Multiyear System		
Expenditure	Expected Life	Cost per Item
\$1 Million	+25 Million Item-Years = (5 Million Items per Year for 5 Years)	\$0.04

Ex[1005] 74. Here, *E&Y* takes overall R&D of \$1 million (IE_k), splitting based on number of items $(\frac{F(IE_k)(o_i)}{\sum F(IE_k)(o_j)})$, and using a straight-line 5-year amortization ($AM_1(L,R)$) for IE per item. Ex[1016] ¶379.

E&Y also teaches calculating the “average advertising expense per product unit” as an overhead by “allocate[ing] the average amount per account” and “amortiz[ing] the advertising expense.” Ex[1005] 75-76; Ex[1016] ¶380. *E&Y* shows:

Advertising expense per account per month	=	Annual budgeted advertising Number of accounts × 12 months
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Ex[1005] 76. Here, *E&Y* calculates advertising expense (IE_k) per account ($\frac{F(IE_k)(o_i)}{\sum F(IE_k)(o_j)}$) per month ($AM_1(L,R)$). Ex[1016] ¶380. The

formula above can be rewritten to match Claim 25:

$$AdExpPerAcctPerMonth = \sum \frac{1 \text{ month}}{12 \text{ months}} * \left[AnnualAdExp * \frac{1}{NumOfAccts} \right]$$

equivalent to:

$$IE(o_i) = \sum AM_1(L, R) * \left[IE_k * \frac{F(IE_k)(o_i)}{F(IE_k)(o_j)} \right]$$

Ex[1016] ¶380. Thus, *E&Y* teaches the IE of Claim 25.

8. Dependent Claim 26

E&Y anticipates and renders obvious Claim 26. Ex[1005] 75-77, 209; Ex[1016] ¶¶382-386.

E&Y teaches calculating object provisioning based on a provisioning group apportionment. Ex[1005] 75-77, 209; Ex[1016] ¶¶382-386. *E&Y* teaches:

Another way to deal with the ***loan loss provision*** is to ***allocate net charge-offs (gross charge-offs less recoveries) to the appropriate center, product, or customer*** as an element of the profit and loss statement.

Ex[1005] 77. E&Y's loan loss provision ($P(o_i)$) is calculated by taking the net charge-offs ($PG(o_i)$) and allocating them to the appropriate organizational center, product, or customer ($\frac{Balance(o_i)}{\sum Balance(o_k)}$). Ex[1016] ¶¶383-384.

E&Y also teaches using an outstanding balance to apportion provision:

Taking this number by risk rating, which comes out of the matrix algebra, and ***dividing it into the total expected losses by risk rating***, provides the needed ***periodic provision as a percentage of outstanding balances***.

Ex[1005] 209. Here, the total expected losses for a portfolio ($PG(o_i)$) are multiplied by the percentage of outstanding balance associated with a specific risk rating ($\frac{Balance(o_i)}{\sum Balance(o_k)}$). Ex[1016] ¶¶382-386.

9. Dependent Claim 27

E&Y anticipates and renders obvious Claim 27. Ex[1005] 75-77; 209-211; Ex[1016] ¶¶387-390. Claim 27 recites calculating provisioning by multiplying the provisioning allocated to a provision group ($PG(o_i)$) by an apportionment based on the balance and adjustment factor of an object as a percentage of the balance and adjustment factor of the group ($\frac{Balance(o_i) * RF(o_i)}{\sum Balance(o_k) * RF(o_k)}$).⁴

⁴ *Supra*, n.3. Dr. Weber considers $RPG(o_i)$ as $PG(o_i)$. Ex[1016] ¶388.

As discussed above (VII.B.8), *E&Y* teaches calculating a provision based on a provision group's apportionment. Ex[1005] 75-77, 209. *E&Y* further teaches calculating loan loss provision using a risk adjustment factor: "if there is an increase in credit risk, there should be an increased loan loss reserve with a corresponding provision to account for that increased risk." Ex[1005] 77; Ex[1016] ¶388.

E&Y also teaches a more complex method for adjusting the risk associated with a particular object:

The credit analysis software creates a transition probability matrix. Using this matrix, an absorbing Markov chain calculation is performed to derive ***total expected losses and weighted average number of transitions by risk rating. Needed provision by risk grade is determined by dividing total expected losses by weighted average transitions. Needed reserve by risk grade is determined by multiplying total expected losses by the bank's appropriate loss pattern.*** All of these factors are ***multiplied by current balances by risk rating to achieve a first-cut provision and reserve.***

...

Reports also can be created for the entire portfolio or subsets selected by industry, geography, organizational unit, or other parameter.

Ex[1005] 211; Ex[1016] ¶389. *E&Y* teaches using the total expected losses ($PG(o_i)$) multiplied by the balances and risk rating/risk grade ($Balance(o_i) * RF(o_i) / \sum Balance(o_k) * RF(o_k)$). Ex[1016] ¶389.

10. Dependent Claim 28

E&Y anticipates and renders obvious Claim 28. Ex[1005] 206-211; Ex[1016] ¶¶391-395. Claim 28 recites calculating provisioning by multiplying the exposure, probability, and expected value adjustment for an object, and dividing that value by the object's expected number of reporting periods. The patent fails to describe what "Exposure(o_i)" and "Expected Value Adjustment(o_i)" mean. To the extent a POSITA would have understood these terms, it would have been obvious to a POSITA to use these values in a provision calculation.

E&Y describes various methods of calculating provisioning, including a method using Markov Chains – Loan Migration – to calculate provisions and required reserves as a function of potential losses, probability of those losses, risk factors, and time. Ex[1005] 206-211; Ex[1016] ¶¶391-395. *E&Y* describes loan migration as:

Loan migration analysis is the examination of ***groups of similarly classified loans to determine the level of credit losses***. The first step in quantifying these ***expected credit losses is to disaggregate the loan portfolio by risk rating and understand how balances change from***

one period to the next.

Ex[1005] 206. E&Y provides the following figures, and accompanying explanation, for calculating the loan loss provision:

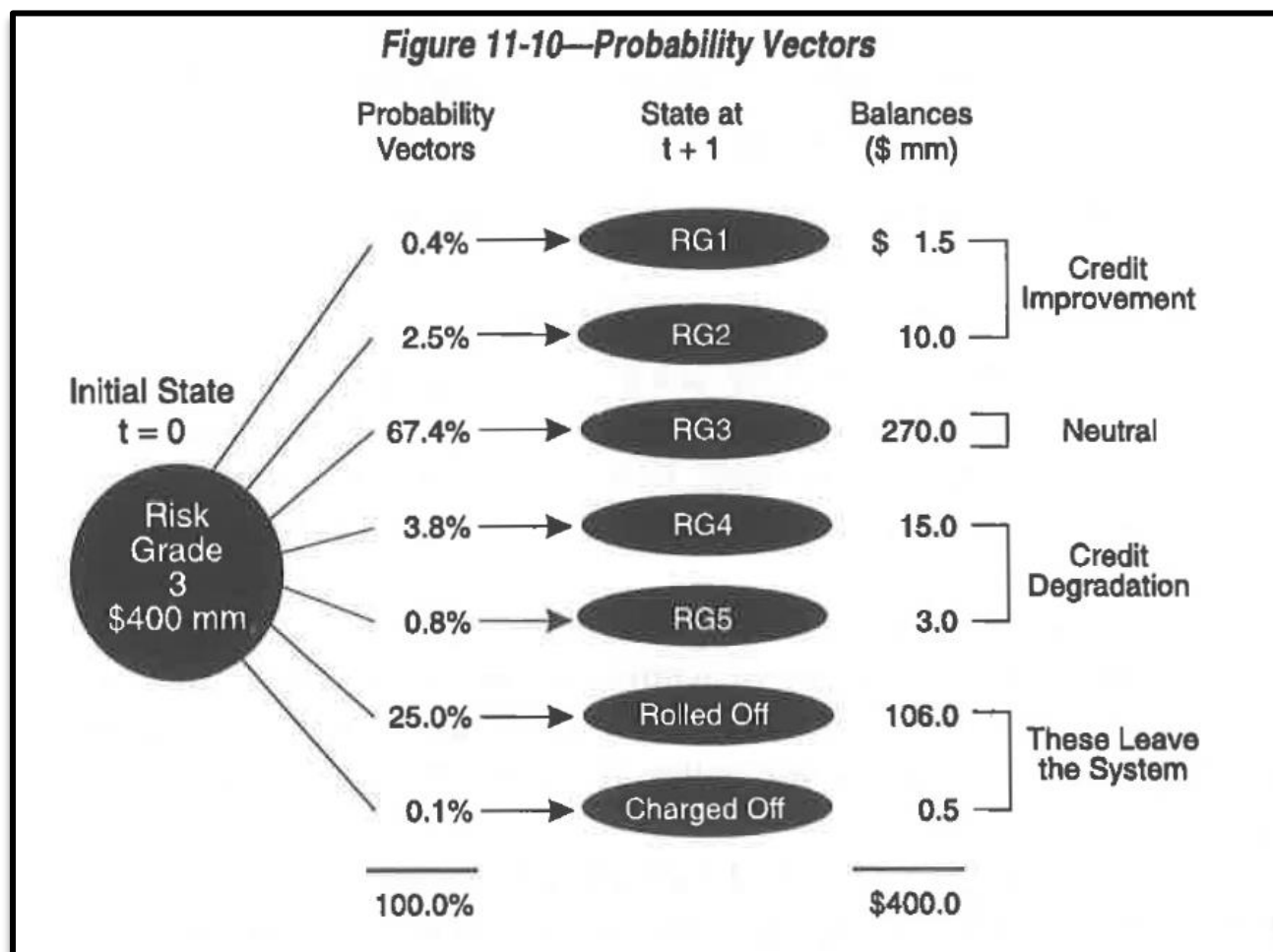
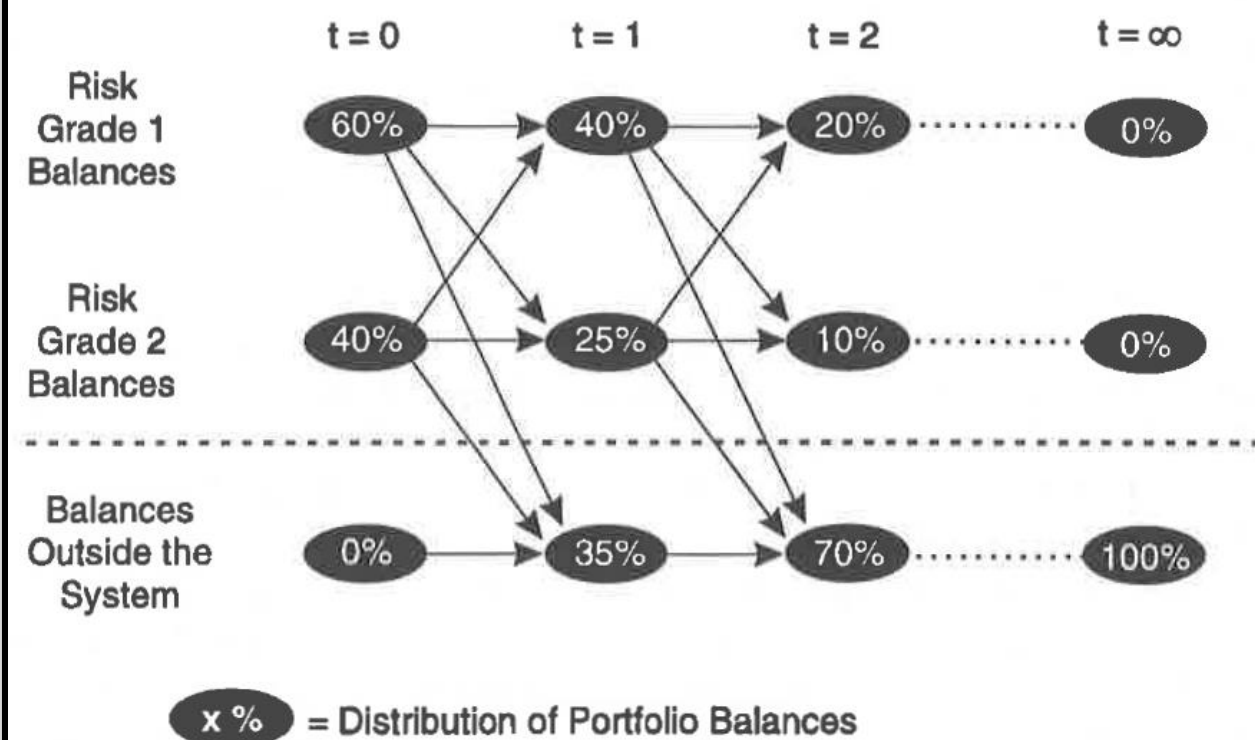


Figure 11-11—Loan Transition Probability Matrix (%)

		Risk Grade This Quarter					Rolled Off	Charged Off
		1	2	3	4	5		
Risk Grade Last Quarter	1	65.0	8.8	0.3	0.0	0.0	25.8	0.0
	2	1.7	66.7	4.5	1.1	0.0	26.1	0.0
	3	0.4	2.5	67.5	3.8	0.8	25.0	0.1
	4	0.0	0.1	3.0	69.0	9.4	17.9	0.6
	5	0.0	0.0	0.3	2.3	89.5	4.3	3.8

Figure 11-12—Illustrative Markov Chain



Step 4 – Calculate the Required Provision

The required *loan loss provision* can be compared to an insurance premium that *amortizes the cost of a loss over the period of time in which the loss can be expected* to occur. The analysis provides the *total expected loss over the life of the portfolio*. In order to *determine the pro rata periodic risk charge*, it is necessary to know *how long the current balances by risk grade will remain on the books*.

Ex[1005] 208-210; Ex[1016] ¶¶391-395. E&Y discloses calculating a loan loss provision of a portfolio (o_i) based on the portfolio balance (Exposure(o_i)), expected loss over portfolio life (Pr(o_i)), the current risk rating (Expected Adjustment Value(o_i)), and the period of time when the loss is expected ($1/L_i$). Ex[1016] ¶393.

E&Y provides additional detail on the Markov Chain process, teaching how the exposure, probability of losses, risk factor, and remaining time change each period. Ex[1005] 208-211; Ex[1016] ¶394. E&Y further teaches above how these factors are used to calculate the required provision (or reserves) for each period. Ex[1005] 208-211; Ex[1016] ¶394. This Markov Chain method can be applied to “the entire portfolio or subsets selected by industry, geography, organizational unit, or other parameter.” Ex[1005] 211.

11. Dependent Claim 29

E&Y anticipates and renders obvious Claim 29. Ex[1005] 17, 30, 224-226; Ex[1016] ¶¶396-400. Claim 29 recites an SVA calculation formula

“consistent with Modern Portfolio Theory and the [CAPM]” and is “a method financial analysts use to adjust profit measures for risk.” Ex[1001] 22:36-59; Ex[1016] ¶¶396-400. Claim 29 recites Claim 6’s calculation (NIR+OR-DE-IE-P) reduced by a tax rate and SVA. §§VII.B.5, VII.B.12.

E&Y teaches: a “shift toward stakeholder-value orientation” has created a focus on “maximizing shareholder value” by “measuring the performance of centers, products/product lines, and customers in terms of return on equity hurdle rates and market comparable ROEs.” Ex[1005] 30. *E&Y* teaches the importance of this profitability calculation: “viewing products as net users or suppliers of shareholder equity” is “useful in measure its success.” Ex[1005] 17; Ex[1016] ¶398.

E&Y also teaches calculating SVA using market betas, business unit betas, cost of capital hurdle rates, market comparables, and CAPM. Ex[1005] 30, 224-226; Ex[1016] ¶¶398-399. Specifically, calculating a “proper hurdle rate for each business line” by “by its beta coefficient, based on the [CAPM]” where “[b]eta is a measure of the risk of the business relative to overall market risk.” Ex[1005] 224; Ex[1016] ¶¶398-399.

E&Y also teaches using “market comparables” to “find observable market betas for banking businesses” to calculate “business line (as opposed to institution-wide) equity costs” by using “regression or factor-analytic techniques to estimate the imputed return-on-equity requirements by major business segments.”

Ex[1005] 225; Ex[1016] ¶398. Thus, *E&Y* teaches calculating SVA according to formula of Claim 29.

As discussed in §VII.B.6, *E&Y* also teaches adjusting profitability by a single tax rate, disclosing using “a single, average tax rate when taxes are included in profitability reports.” Ex[1005] 73. Thus, *E&Y* teaches calculating object level profitability adjusted for taxes and SVA. Ex[1016] ¶¶396-400.

The recitations of Claim 29 would also have been an obvious way to implement the teachings of *E&Y*, including its recitation of calculating SVA using beta and reducing by a tax rate. Ex[1016] ¶¶396-400. For example, as explained by Dr. Weber, the use of CAPM, market betas, and cohorts to calculate SVA were known and predictable financial calculations to a POSITA. Ex[1016] ¶¶234-238, 396-400. Thus, *E&Y* renders obvious Claim 29.

12. Dependent Claim 30

Claim 30’s calculation of a two-tier tax is a basic mathematical derivation and obvious to a POSITA. See VII.A.4(xi); Ex[1016] ¶¶239-243. While *E&Y* does not expressly derive the two-tier effective tax rate, *E&Y* teaches: using a “wide variety of tax structures with which financial institutions operate. Because tax rates vary by country, state, and city, the calculation of a tax effect should reflect the differences” - contemplating the use of multiple tax rates in calculating profitability. Ex[1005] 73; Ex[1016] ¶¶401-404. For simplicity,

many institutions have decided to use “a single, average tax rate when taxes are included in profitability reports.” Ex[1005] 73. It would have been obvious to a POSITA to combine two tiers of taxes using basic mathematical properties to create a single tax rate for profitability calculations. Ex[1016] ¶¶401-404.

As explained, *E&Y* teaches all of the elements in the challenged claims. To the extent that any element is alleged missing from *E&Y*, it would have been obvious to a POSITA to use the well-known teachings in the prior art, discussed above (VII.A.3-VII.A.4(xi)), to meet those elements in implementing the system of *E&Y*. Moreover, a POSITA reading the various teachings and examples of *E&Y* would at once envisage the claimed arrangements of the challenged claims Ex[1016] ¶406. It would also be obvious to combine the various teachings and examples of *E&Y* set forth above, as they are all discussed in the single reference and described as desirable approaches, and a POSITA would be motivated to implement the teachings therein in accordance with the examples discussed in *E&Y*. A POSITA would expect success in carrying out that implementation in view of *E&Y*’s express teachings, suggestions and motivations set forth above, because it would be common sense when implementing *E&Y*’s teachings to try utilizing the approaches set forth in *E&Y*’s example implementations. Ex[1016] ¶406.

C. Grounds 4-5: Claims 2, 4-5, and 25 are Anticipated and Rendered Obvious by *Blain*

1. Independent Claim 1

(i) *Element 1[preamble]*

If it is limiting, the preamble is taught by *Blain*. Ex[1016] ¶¶114, 407-408. An RDBMS, as explained below (1[a]-[d]), is taught by *Blain* and would have been an obvious way to implement *Blain*'s object level profitability system. Ex[1006]; Ex[1016] ¶¶115-142, 409-431.

(ii) *Element 1[a]*

Blain teaches storing financial and non-financial data in a computerized profit database. Ex[1006] 41, 196-198, 209-217, 234, 329; Ex[1016] ¶¶410-413. *Blain* discloses that the SAP-R/3 system provides the three essential services of "Database Management, Application Processing, and Presentation Services," either on different processing systems or in "a central system by itself." Ex[1006] 41.

Blain explains: "an online accounting system has to maintain a journal, a set of account balances and all the documents to support them." Ex[1006] 329. And the "general ledger is the source from which are built the external accounting documents, the balance sheet, and the profit and loss statement." Ex[1006] 196;. In *Blain*'s system: "[t]ransaction data are stored

centrally in the document database, and the corresponding line items and details are stored in the sub-ledgers.” Ex[1006] 234. This teaches element 1[a]. Ex[1016] ¶¶410-413.

(iii) *Element 1[b]*

Blain teaches element 1[b]. Ex[1006] 36-38, 41, 54-55, 71; Ex[1016] ¶¶414-416. Specifically, *Blain*, uses a database to store transactions and a database management system to search the database and generate reports. Ex[1006] 71; Ex[1016] ¶¶414-416. *Blain* describes the interaction between the raw data and the database using SQL “for open data access to R/3 **business data stored in relational databases.**” Ex[1006] 36. *Blain* further describes electronic access to the database, disclosing that the “central database can be serviced in a single processor, a multi-processor, or a cluster of processors.” Ex[1006] 38.

Blain also discloses the portability of SAP-R/3 across RDBMSs including “Informix, Oracle, Software AG, Sybase.” Ex[1006] 37. These database systems (*e.g.*, Oracle, Sybase) were well-known RDBMSs at the time of the invention. Ex[1014] 23; Ex[1016] ¶¶117, 414-416. *Blain*’s database system management system for relational databases is an RDBMS and the use of concurrency in a distributed database system shows that SAP-R/3 acts as a RDBMS. Ex[1006] 54, 71; Ex[1016] ¶¶414-416.

(iv) *Element 1[c]*

Blain teaches element 1[c]. Ex[1006] 36-37, 54, 275-278, 311-314, 643; Ex[1016] ¶¶417-423. As discussed above (1[b]), *Blain* shows accessing profit information through the relational database. Ex[1006] 36-37, 54, 643; Ex[1016] ¶¶410-416. As discussed in §VII.B.1[c], the Patent’s description of “opportunity values” includes at least “transfer pricing.”

Blain discloses calculating transfer prices for any cost objects or goods according to a user’s rules. Ex[1006] 311; Ex[1016] ¶¶419-420. *Blain* describes the CO-PA Profitability Analysis module, which uses “[b]illing documents, [s]ales quantities, [r]evenues, and [s]ales deductions” as data used to calculate transfer prices for goods issued, received, or manufactured. Ex[1006] 311.

Blain also says the CO-PA Profitability Analysis module drives profitability calculations (including transfer prices) to the object level. Ex[1006] 311; Ex[1016] ¶¶420-422. *Blain* discloses that “[c]riteria may be combined across dimensions and levels to make a business segment specification that will give you the profitability analysis” applied “in terms of products, customers, activities and organization, combined in any way you want.” Ex[1006] 314. *Blain* also discloses attributing all costs and revenues to profit objects: “each of these flows via the FI-GL General Ledger account to the appropriate cost or profit object.” Ex[1006] 278; Ex[1016] ¶¶420-422. Thus, *Blain* teaches element 1[c].

In addition, to the extent it is argued that element 1[c] is not taught by *Blain*, it would have been obvious to a POSITA to apply well-known opportunity value calculations (*i.e.*, transfer pricing) with the database system of *Blain* to calculate object level profitability since *Blain* discloses using transfer pricing. §VII.A.3(iv); Ex[1016] ¶¶126-134, 417-423.

(v) *Element 1[d]*

Blain teaches element 1[d]. Ex[1006] 89, 203, 284-289, 299, 308-318, 323, 356; Ex[1016] ¶¶424-431.

Blain – a reference book – is about implementing rules in a relational database system to calculate profit. Ex[1006] 323. *Blain* discloses that “**cost data are allocated according to rules** which are under your control.” Ex[1006] 311. *Blain* says the CO-ABC module includes the step to “[a]llocate, or set up **rules to allocate, activity costs** for both planned and actual data.” Ex[1006] 284. *Blain* also discloses establishing rules to process information: “**all costs are based on unified posting and settlement rules in the SAP-R/3 system.**” Ex[1006] 299.

Blain’s use of an RDBMS, with SQL, anticipates “providing information necessary to select objects” since SQL enables/requires defining database tables and relationships, and methods for at least selecting objects. Ex[1016] ¶428. Additionally, *Blain* discloses various methods of identifying data within the system: uniform chart of accounts; company identification code; cost

element identification code. Ex[1006] 203, 289; Ex[1016] ¶¶428-429. *Blain* describes the SAP-R/3 data object structure including an object identification code and fields containing information about the object. Ex[1006] 89; Ex[1016] ¶¶428-429.

Blain discloses methods for performing a profit calculus throughout the book, including allocating cost data “according to rules” to “display a business-oriented profit and loss analysis” that can be “scrutinized down to the details of the individual transactions.” Ex[1006] 311; Ex[1016] ¶430. Thus, *Blain* teaches element 1[d].

(vi) *Element 1[e]*

Blain teaches element 1[e]. Ex[1006] 207, 217, 304-313; Ex[1016] ¶¶432-438. As discussed above (§§VII.C.1(iii)-VII.C.1(v)), *Blain* discloses using rules, established in a relational database, to perform profit calculations. Ex[1016] ¶¶414-431.

Blain discloses “independently calculat[ing]” profit values: “cost object could be an entity which is quite independent of any particular SAP application.” Ex[1006] 304; Ex[1016] ¶433. *Blain* also teaches calculating profit values by automatically distributing costs to a cost center using the “dynamic method.” Ex[1006] 217; Ex[1016] ¶¶433-435.

Blain calculates any objects' profitability using "**marginal** and absorption costing in parallel." Ex[1006] 306; Ex[1016] ¶¶435-437. *Blain* also discloses that "[p]rofitability accounting requires that **profit and loss be calculated on the basis of both full costs and marginal costs.**" Ex[1006] 309; Ex[1016] ¶¶435-437.

Blain also discloses calculating provisioning and direct expense – both marginal values of profit (§VII.B.1(vi)). Ex[1006] 207, 311-313, 1047-1053; Ex[1016] ¶¶432-438. For example, *Blain* calculates provisioning including reserves for: cost of complaints and sales deductions; imminent loss; and unrealized costs. Ex[1006] 1053-1059; Ex[1016] ¶¶432-438. *Blain* also discloses allocating "direct costs to other cost objects" that incur those costs. Ex[1006] 311; Ex[1016] ¶¶435-437.

(vii) *Element 1[f]*

Blain teaches this. Ex[1006] 306-318, 1054; Ex[1016] ¶¶439-442. As discussed above (§VII.C.1(vi)), *Blain* teaches calculating a marginal value of profit. *Blain* also teaches the simple combination of these values and a POSITA would find it obvious. Ex[1016] ¶442.

Blain discloses combining a marginal value of profit (*e.g.*, all direct expenses):

Overhead Costing

Most common method in product cost accounting. Method as follows:

- ***Assign the direct costs to the cost object.***
- Apply the indirect (overhead) costs to the cost object in proportion to the direct costs, expressed as a percentage rate.

Ex[1006] 1054; Ex[1016] ¶440. Here, direct costs are combined together. They are also combined with indirect costs, which in this patent Claim 3 indicates can also be grouped as a marginal value of profit. *Blain* also discloses calculating and combining “***marginal and absorption costing in parallel***” and that “[p]rofitability accounting requires that profit and loss be calculated on the basis of both ***full costs and marginal costs***.” Ex[1006] 306-310; Ex[1016] ¶¶440-441. Further, *Blain* teaches that all costs and profit calculations, including all revenues and expenses, “flow[] via the FI-GL General Ledger account to the appropriate cost or ***profit object***.” Ex[1006] 278; Ex[1016] ¶441.

2. Dependent Claim 2

Blain anticipates and renders obvious using relational databases with SQL. Ex[1006] 36, 57-58, 181, 1060; Ex[1016] ¶¶444-446. *Blain* discloses that “international standards have been embodied in the R/3 system” including “***SQL, Structured Query Language***, and ODBC, Open Data Base Connectivity, [that] are the ***standards used for open data access to R/3 business data stored in relational databases***.” Ex[1006] 36; Ex[1016] ¶445. *Blain* also describes integrating

various relational databases using SQL – “Informix, Oracle, Software AG, [and] Sybase.” Ex[1006] 37; Ex[1016] ¶445; see Ex[1014] 23. *Blain* teaches that SAP-R/3 uses an open system concept to interface with various databases using SQL, disclosing:

The standard adopted language for the definition of data and for its manipulation ***is the SQL, Structured Query Language. Any database that can interface according to this standard can be utilized by the R/3 system*** without the user needing to be aware of the detailed mechanisms of the database server.

Ex[1006] 57.

3. Dependent Claim 4

As discussed in §VII.C.1(vi), *Blain* teaches provisioning. Ex[1006] 313, 207, 1053; Ex[1016] ¶¶447-451. *Blain* discloses calculating provisioning including “sales deductions” explaining that “the CO-PA Profitability Analysis system will then adjust the calculation for future estimates.” Ex[1006] 313; Ex[1016] ¶450. *Blain* also discloses calculating provisioning as “[s]pecific reserves set aside for doubtful accounts,” which describes a profit value adjustment for possible future outcomes. Ex[1006] 207; Ex[1016] ¶450. *Blain* also describes additional provisions as reserves for future outcomes, including “reserves for unrealized costs,” “reserves for the cost of complaints and commissions,” and “reserves for imminent loss.” Ex[1006] 1053; Ex[1016] ¶450. Thus, *Blain*

anticipates and renders obvious provisioning for future outcomes according to Claim 4.

4. Dependent Claim 5

Blain discloses calculating indirect expenses. Ex[1006] 287, 1050-1054; Ex[1016] ¶¶452-455. *Blain* describes indirect expenses as:

Indirect Costs

Costs for which one single receiving object cannot be directly and fully identified according to the cost-by-cause-principle; for example:

- ***Indirect expenses, such as building insurance***
- Indirect labor cost, such as supervisor wages
- Indirect materials cost, such as coolant cleaning materials

Ex[1006] 1050; Ex[1016] ¶454. In addition to calculating indirect costs, *Blain*'s "system has ***indirect cost allocation functions*** that you can use to ***allocate costs accurately to the objects.***" Ex[1006] 287. *Blain* also describes allocating overhead to cost objects as an indirect expense. Ex[1006] 287, 1054; Ex[1016] ¶¶452-455.

5. Dependent Claim 25

As discussed above (§VII.C.4), *Blain* teaches calculating indirect expenses. Ex[1006] 255-256, 275-287; Ex[1016] ¶¶456-460. *Blain* further

teaches Claim 25's amortizing indirect expenses apportioned to objects. Ex[1006] 255-256, 275-287; Ex[1016] ¶¶456-460. For example, *Blain* discloses a standard method within SAP-R/3, available to all cost objects, to amortize any expenses. Ex[1006] 255-256; Ex[1016] ¶459. *Blain* teaches grouping and allocating indirect expenses: "indirect cost allocation functions" can be used to provide "allocation across a pattern of cost centers" using information such as "measurements of time required, number, weight," "volume," "count," "capacity," "output quantity," and "balance." Ex[1006] 275-287; Ex[1016] ¶¶459. By disclosing amortizing and apportioning indirect expense to a cost object, *Blain* anticipates and renders obvious the indirect expense calculation of Claim 25. Ex[1016] ¶¶456-460.

The elements of Claims 2, 4-5, and 25 are taught by *Blain* (§§VII.C.1-VII.C.5). Additionally, it would have been obvious for a POSITA to combine the well-known concepts (§VII.A) purportedly claimed with the enterprise database profitability system of *Blain* to render the claims obvious. Moreover, a POSITA reading the various teachings and examples of *Blain* would at once envisage the claimed arrangements of the challenged claims Ex[1016] ¶461. It would also be obvious to combine the various teachings and examples of *Blain* set forth above, as they are all discussed in the single reference and described as desirable approaches, and a POSITA would be motivated to implement the teachings therein in accordance with the examples discussed in *Blain*. A POSITA would expect

success in carrying out that implementation in view of *Blain*'s express teachings, suggestions and motivations set forth above, because it would be common sense when implementing *Blain*'s teachings to try utilizing the approaches set forth in *Blain*'s example implementations. Ex[1016] ¶461.

D. Grounds 6-7: Claims 2 and 4-6 are Anticipated and Rendered Obvious by SAP-IS-B

1. Independent Claim 1

(i) *Element 1[preamble]*

To the extent it is limiting, the preamble is taught by *SAP-IS-B*. Ex[1016] ¶114, 462. The recitation of an RDBMS, as explained below (1[a]-[d]), is taught by *SAP-IS-B* and would have been an obvious way to implement *SAP-IS-B*'s profitability system. Ex[1007]; Ex[1016] ¶¶115-121, 465-486.

(ii) *Element 1[a]*

SAP-IS-B teaches storing financial and non-financial data in a computerized profit database. Ex[1007] 7, 14, 16, 19-21, 32-37, 58-61, 88; Ex[1016] ¶¶465-469. *SAP-IS-B* discloses that “[t]he standard R/3 System architecture consists of a three-tier hierarchy” including “a host (database server) for carrying out all functions requiring access to the database.” Ex[1007] 19; Ex[1016] ¶466. Going further: “IS-B is an R/3 solution for client/server

architectures based on ***relational database technology***” that “has its own databases in the form of a data pool, which is supplied with the necessary information from central R/2 or R/3 systems or from other systems implemented by the bank.” Ex[1007] 21. SAP-IS-B describes the type of information stored in the data pool: ***“[t]he database for IS-B is a data pool used by all components, which are fed with transaction data.”*** Ex[1007] 7. This transaction data constitutes financial information that is used for profitability analysis. Ex[1007] 32-37; Ex[1016] ¶466.

SAP-IS-B further explains that ***“the data pool contains master and transaction data*** which is needed for costing, regulatory reporting and risk management” including information on banking transaction master records, business partners, stock classes, business partner accounts, and financial terms. Ex[1007] 35; Ex[1016] ¶467. Movement/transaction data “consists of single items of information which refer to specific transactions” including account items, commercial transactions, individual purchases and sales, and cash flows. Ex[1007] 35; Ex[1016] ¶467.

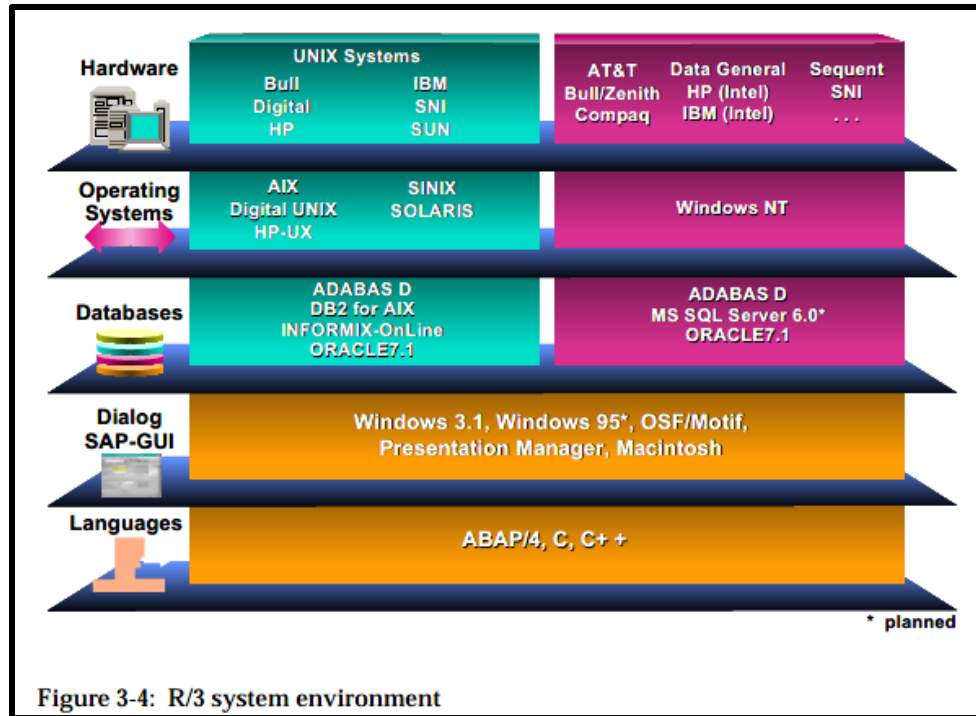
In addition to storing financial and non-financial information, SAP-IS-B also stores calculated profit values in the database (e.g., accumulated totals records). Ex[1007] 57-61; Ex[1016] ¶468. And SAP-IS-B stores backdated profitability calculations, explaining that “profitability analysis results for the

affected period are available in the data pool (as line items per single transaction/single position).” Ex[1007] 44; Ex[1016] ¶468.

(iii) *Element 1[b]*

SAP-IS-B teaches element 1[b]. Ex[1007] 6, 19-24; Ex[1016] ¶¶470-472. As discussed in §VII.D.1(ii), *SAP-IS-B* discloses storing profit information in a relational database or data pool for use in profitability calculations. Ex[1016] ¶¶465-469. *SAP-IS-B*’s relational database technology, in the form of a data pool, uses information from (*i.e.*, is operable in association with) the central R/3 system or other bank data systems. Ex[1016] ¶¶465-472. *SAP-IS-B* discloses that SAP-R/3 comprises “a host (database server) for carrying out all functions requiring access to the database.” Ex[1007] 19; Ex[1016] ¶470.

Additionally, *SAP-IS-B* shows integrating well-known RDBMSs:



Ex[1007] 23; Ex[1016] ¶471. DB2, Oracle, and MS SQL Server databases were useable with SAP-R/3. Ex[1016] ¶471. Each of them were well-known RDBMSs. Ex[1014] 24; Ex[1016] ¶¶122-125, 471.

(iv) *Element 1[c]*

SAP-IS-B teaches element 1[c]. Ex[1007] 27, 38, 42, 47-48, 62-65, 86-90; Ex[1016] ¶¶473-479. As discussed in §VII.D.1(ii), SAP-IS-B discloses storing and accessing information through a relational database. Ex[1016] ¶¶465-469.

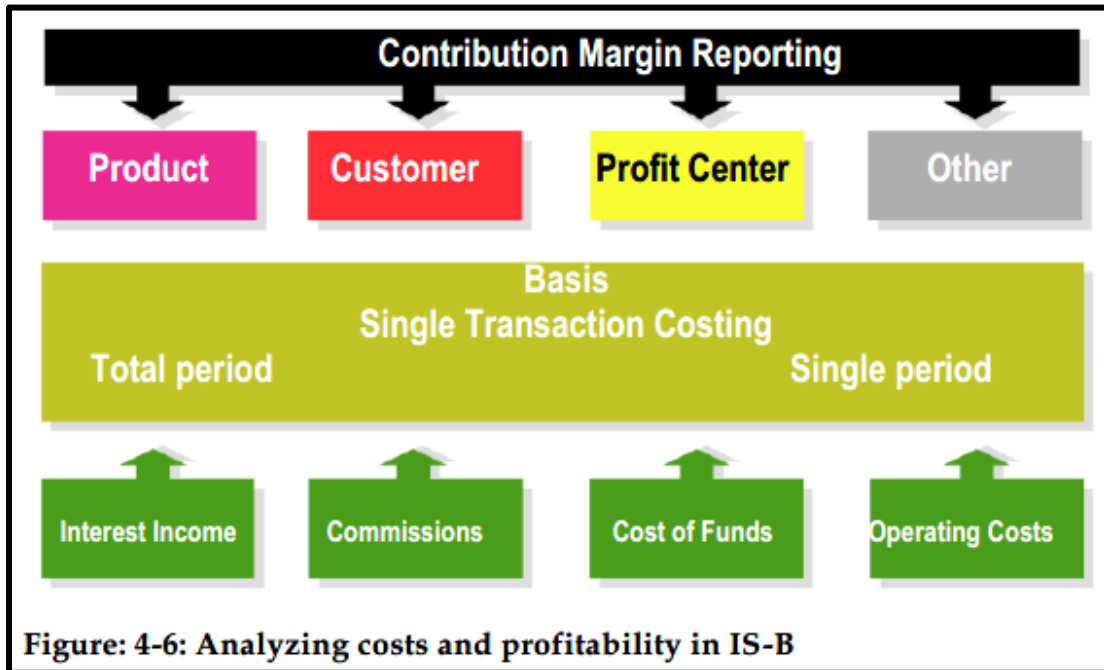
SAP-IS-B also shows preparing data to be accessed and processed for profitability analysis: “customizing [for a user] ... consists of *setting up basic data*” including the “bank’s organizational structure, characteristics and value

fields of operating concern, product catalog, costing rules, [and] regulatory reporting rules.” Ex[1007] 27; Ex[1016] ¶474. Additionally, *SAP-IS-B* uses “user-defined data structures” that are “entered into the SAP Repository” using “mapping rules *for transferring data from the sender to the receiver system*” to “*process[] the records in IS-B.*” Ex[1007] 38; Ex[1016] ¶474.

SAP-IS-B also teaches calculating opportunity values for each measured object. Ex[1007] 42, 47-48, 62-65, 86-88; Ex[1016] ¶¶475-479. As discussed in §VII.A.3(iv), “opportunity values” in the Patent includes at least “transfer pricing.” Ex[1016] ¶¶126-134.

SAP-IS-B calculates “opportunity interest” – “effective interest rate of the alternative transaction on the money and capital market” using the “market rate approach to transfer pricing.” Ex[1007] 89; Ex[1016] ¶¶475-477. *SAP-IS-B* discloses a “procedure for matched-maturities valuation” including calculating “*opportunity interest rate, as effective interest of alternative.*” Ex[1007] at 52. The “*opportunity interest* is calculated for all balance sheet items” including “equity capital” by “offsetting the *weighted opportunity interest for all items on the asset side* ... with the *weighted opportunity interest for all items on the liability side.*” Ex[1007] 89. Thus, *SAP-IS-B* teaches calculating opportunity interest values for all balance sheet items, including assets, liabilities, and equity.

Additionally, *SAP-IS-B* assigns all costs and revenue (including opportunity interest rates) to “various criteria within profitability analysis” including “product, customer, [and] organization unit (profit center)” as depicted:

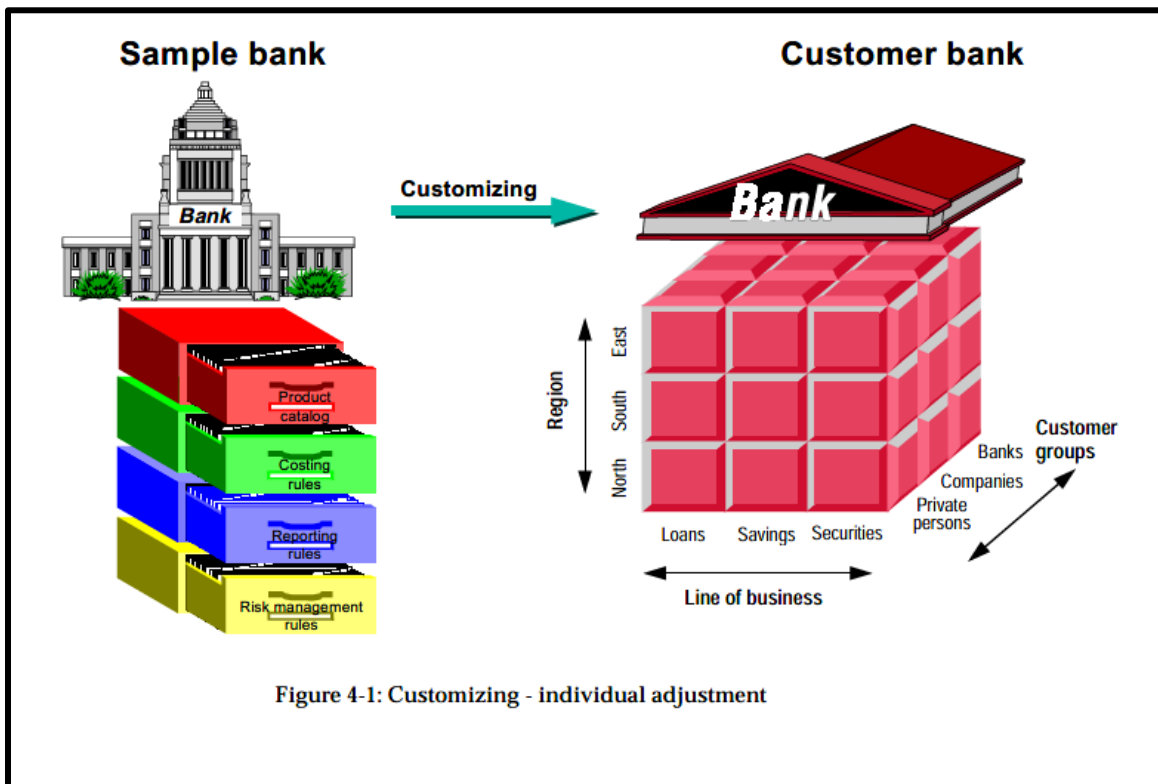


Ex[1007] 42; Ex[1016] ¶478. *SAP-IS-B* above depicts calculating opportunity values (e.g., cost of funds) for each transaction and applied to an object (i.e., Product, Customer, Profit Center, Other). Ex[1016] ¶478.

(v) *Element 1[d]*

SAP-IS-B teaches this. Ex[1007] 6-12, 17-23, 27, 31-33, 40-44, 58-72, 75-79; Ex[1016] ¶¶480-486. As discussed above (§§VII.D.1(ii)-VII.D.1(iv)), *SAP-IS-B* teaches preparing information in a relational database to perform profit calculations. Ex[1016] ¶¶465-479.

SAP-IS-B implements banking business rules on a relational database system for bank profitability analysis. Ex[1007] 9-15. *SAP-IS-B* teaches establishing rules for processing information including “costing rules, regulatory reporting rules, [and] risk management rules.” Ex[1007] 27. *SAP-IS-B* depicts at least “Costing,” “Reporting,” and “Risk management” rules:



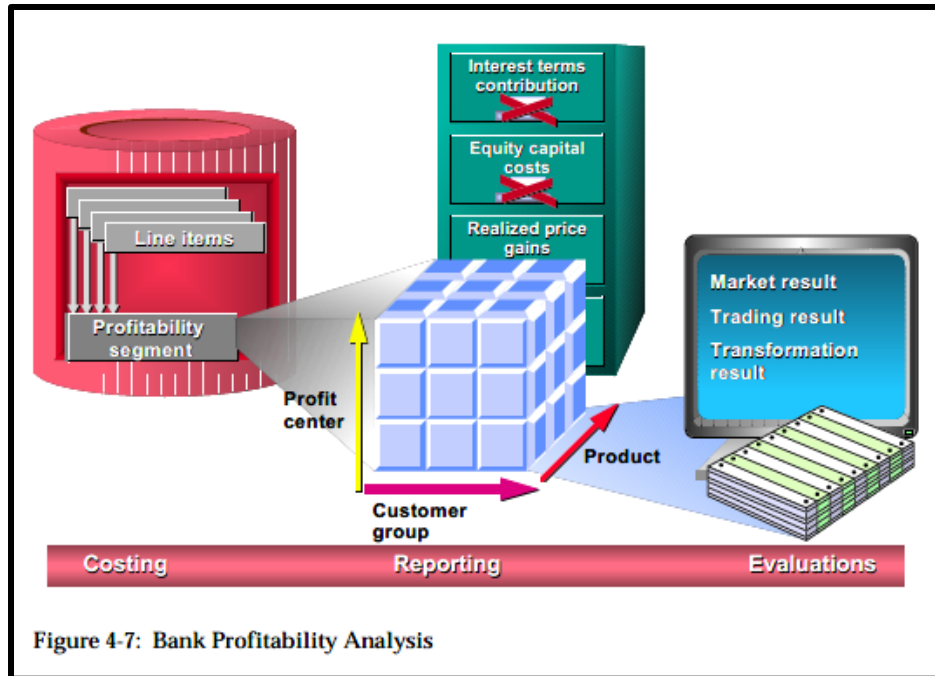
Ex[1007] 27; Ex[1016] ¶481. Here, “[u]ser-defined costing rules and costing methods” specify “the costing components (risk costs, interest terms contribution) for a single transaction” which are “then assigned to each user-defined bank product.” Ex[1007] 32; Ex[1016] ¶481.

Additionally, *SAP-IS-B* establishes database rules for imported or exported data – “conversion rules” are “maintained by the user” and the “rules

support the conversion of data structures from the external (operational) systems to the IS-B data structures.” Ex[1007] 87; Ex[1016] ¶¶482-484.

SAP-IS-B has information necessary (*e.g.*, product catalog, number assignments, matchcodes) to select an object (*e.g.*, region, line of business, customer group) and calculate profitability for those objects using rules. Ex[1007] 75-79; Ex[1016] ¶¶482-486. Additionally, *SAP-IS-B*’s “data pool contains master and transaction data” which includes information that allows the system to select and allocate profitability to objects (*e.g.*, business line, customer group, product group). Ex[1007] 35-36; Ex[1016] ¶484.

Finally, *SAP-IS-B*’s “Bank Profitability Analysis” is performed for any “customer group, product, risk class, branch” based on user-assigned rules. Ex[1007] at 57; Ex[1016] ¶¶482-485. *SAP-IS-B* depicts this profitability segmentation:



Ex[1007] 60; Ex[1016] ¶485.

(vi) *Element 1[e]*

SAP-IS-B teaches element 1[e]. Ex[1007] 10, 36-42, 63; Ex[1016] ¶¶487-492. As discussed in §VII.D.1(iii), *SAP-IS-B* uses an RDBMS to perform profit calculations. Ex[1016] ¶¶470-472. As discussed in §VII.D.1(v), *SAP-IS-B* also uses rules established in the database to calculate profit. Ex[1016] ¶¶480-486.

SAP-IS-B independently calculates marginal values of profit: “all selected costing methods are analyzed simultaneously; IS-B then issues a list of relevant fields, sorted according to tables.” Ex[1007] 36; Ex[1016] ¶488. And “[w]ithin the Cost Accounting module, various cost accounting systems can run in parallel.” Ex[1007] 10; Ex[1016] ¶488.

SAP-IS-B shows calculating “at least one marginal value of profit for each object being measured” in this profitability report:

Interest income					
- Opportunity income					
= Interest terms contribution - active					
+ Commission income					
- Commission costs					
= Commission contribution (subtotal)					
= Contribution margin I					
- Standard unit costs					
- Standard cancellation costs					
- Equity capital costs					
= Contribution margin II					
- Indirect costs					
= Contribution margin III = market result					

Interest Income/Expense
± Opportunity Values (COF/VOF)
(± Equity Capital Costs)
Net Interest

+ Other Revenue

- Direct Expenses

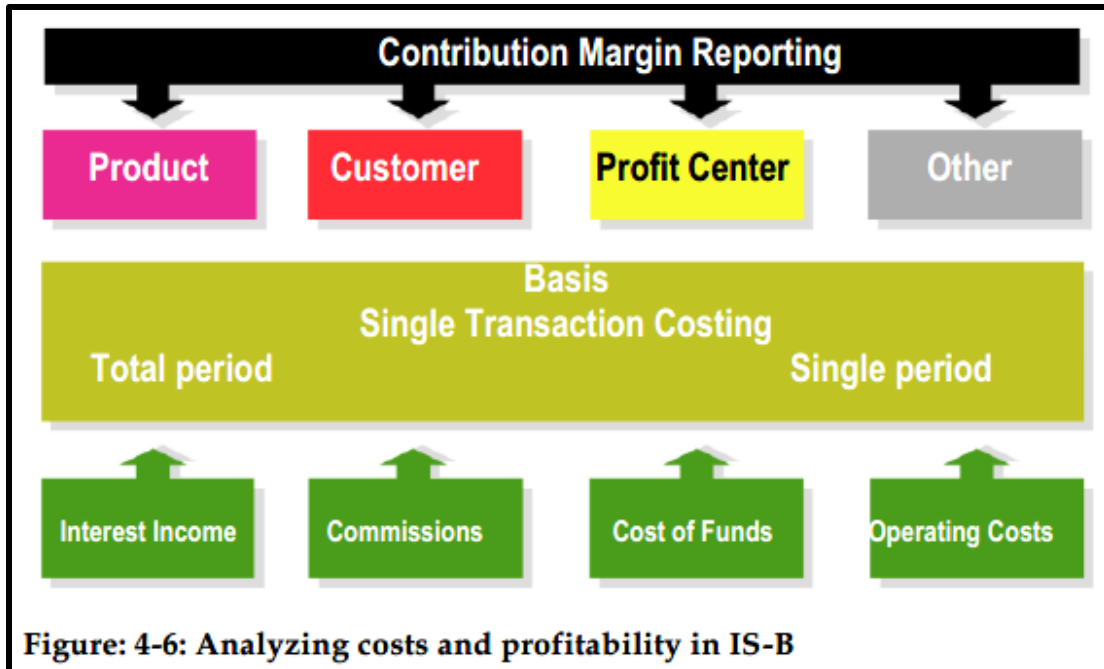
- Direct Expenses

- Provisioning

Ex[1007] 63; Ex[1016] ¶¶489-491. The figure calculates multiple marginal values of profit:

- net interest (Interest Income, Opportunity Income, Equity Capital Costs),
- other revenue (Commission Income),
- direct expense (Commission costs, Standard unit costs), and
- provisioning (Standard Cancellation Costs).

Ex[1016] ¶¶489-491. SAP-IS-B also shows calculating marginal value of profit below:



Ex[1007] 42; Ex[1016] ¶¶489-491. This shows net interest (*i.e.*, Interest Income less Cost of Funds), other revenue (*i.e.*, Commissions), and direct expenses (*i.e.*, Operating Costs) on a per-object basis (Product, Customer, Profit Center, Other). Since each of these comprise “at least one marginal value of profit,” *SAP-IS-B* teaches element 1[e].

(vii) *Element 1[f]*

SAP-IS-B teaches element 1[f]. Ex[1007] 10, 36-42, 55-58, 61; Ex[1016] ¶¶493-498. As discussed above (§§VII.D.1(vi)), *SAP-IS-B* uses the *SAP-R/3* database system to calculate a marginal value of profit. Ex[1016] ¶¶487-523. The simple combination of these values would have been obvious to a POSITA. Ex[1016] ¶498.

SAP-IS-B discloses combining “standard unit costs (direct and directly attributable costs)” (*e.g.*, direct expenses) and “cost center overhead rates (indirect costs of cost centers close to the market)” (*e.g.*, indirect expenses) to calculate profitability. Ex[1007] 55-58; Ex[1016] ¶494. Direct costs are combined together, and also combined with indirect costs, which in this patent Claim 3 indicates can also be grouped as a marginal value of profit.

SAP-IS-B also combines marginal values of profit (*e.g.*, NI, OR, DE and P below) per transaction:

Interest income		
- Opportunity income		
= Interest terms contribution - active		
+ Commission income		+ Other Revenue
- Commission costs		- Direct Expenses
= Commission contribution (subtotal)		
= Contribution margin I		
- Standard unit costs		- Direct Expenses
- Standard cancellation costs		- Provisioning
- Equity capital costs		
= Contribution margin II		
- Indirect costs		- Indirect Expenses
= Contribution margin III = market result		

Ex[1007] 63; Ex[1016] ¶495. The figure above calculates and combines:

- marginal values of profit:

- net interest (Interest Income, Opportunity Income, Equity Capital Costs)
- other revenue (Commission Income)
- direct expense (Commission costs, Standard unit costs), and
- provisioning (Standard Cancellation Costs)

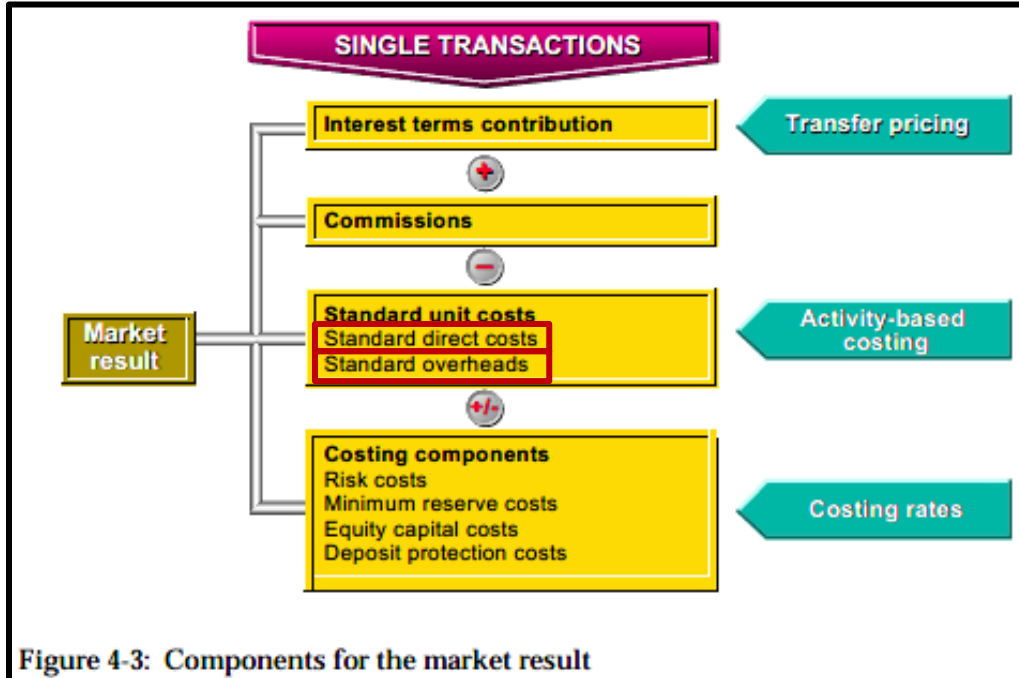
with

- the indirect expenses (Indirect Costs),

to create

- a measure of object level profitability (market result).

Ex[1016] ¶495. SAP-IS-B further depicts the calculations:



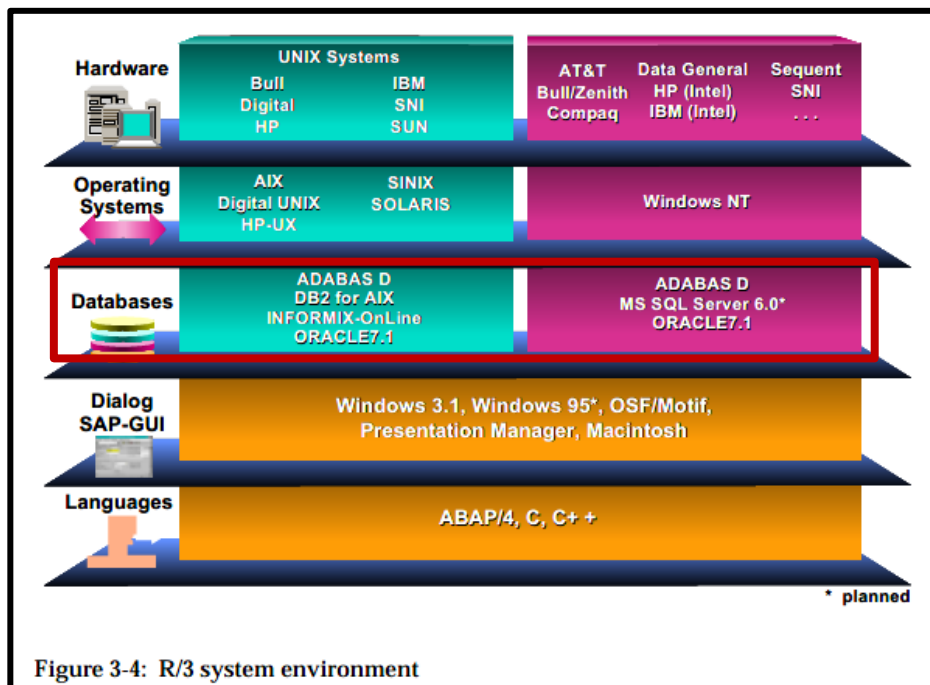
Ex[1007] 33; Ex[1016] ¶495. This also shows combining direct costs and overhead costs. Ex[1016] ¶495. And profitability is reported for each

profitability segment (*e.g.*, customer group, product, risk class, branch). Ex[1007] 57-60; Ex[1016] ¶496.

2. Dependent Claim 2

SAP-IS-B uses relational databases with SQL. Ex[1007] 23, 58; Ex[1016] ¶¶499-501. As discussed above (§§VII.D.1(ii)-VII.D.1(iii)), SAP-IS-B uses relational databases to calculate profitability. Ex[1016] ¶¶465-472.

SAP-IS-B depicts the SAP-R/3 environment as:



Ex[1007] 23; Ex[1016] ¶500. Here, SAP-R/3 is used with DB2, Oracle, and MS SQL Server. Ex[1016] ¶500. Each of DB2, Oracle, and MS SQL Server were well-known RDBMSs using SQL; indeed MS SQL Server has “SQL” in the name. Ex[1014] 24; Ex[1016] ¶500.

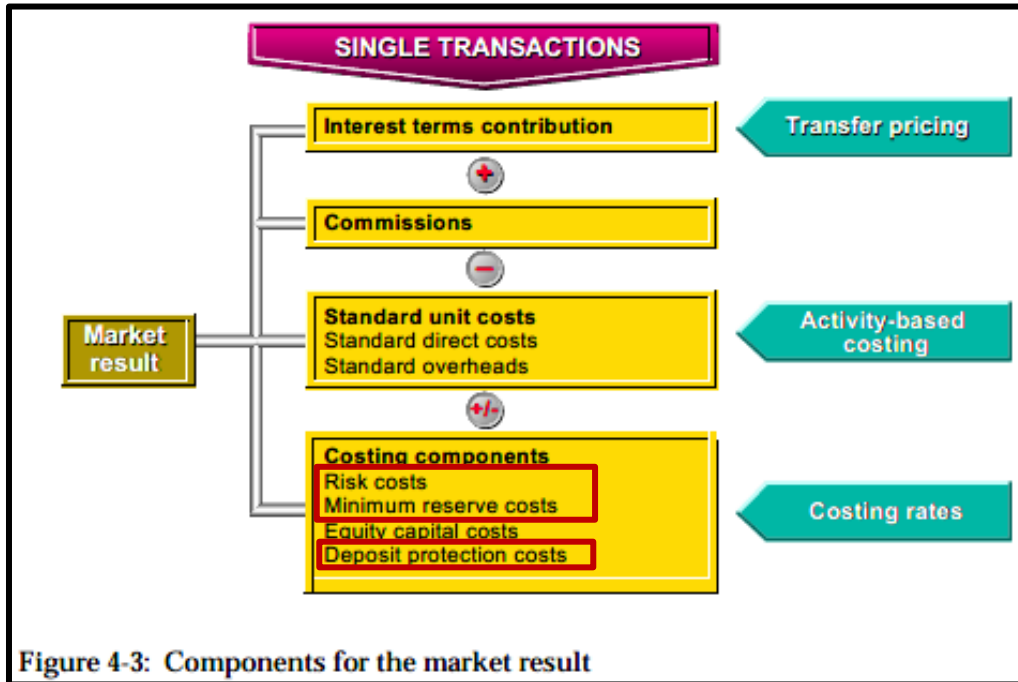
SAP-IS-B also uses database queries – “Bank Profitability Analysis supports” an “ad hoc report: you define this at the time of query.” Ex[1007] 58-61; Ex[1016] ¶500. A POSITA would understand *SAP-IS-B*’s discussion of queries and discussion of relational databases to mean using a structured query language. Ex[1016] ¶500.

In addition, to the extent it is argued that *SAP-IS-B* does not expressly teach SQL, a POSITA would find it obvious to use an RDBMS disclosed in *SAP-IS-B* (MS SQL Server, Oracle) with the well-known SQL (VII.A.4(i)) to render Claim 2 obvious, as SQL is an efficient way to access data from a RDBMS.

3. Dependent Claim 4

SAP-IS-B teaches Claim 4. Ex[1007] 33, 61-64, 88; Ex[1016] ¶¶524-529. As discussed above (§VII.D.1(vi)), *SAP-IS-B* calculates provisioning for future outcomes.

SAP-IS-B discloses provisioning – expected profit value adjustment for future outcomes – by disclosing calculating minimum reserve costs, risk costs, and deposit protection costs for each transaction:



Ex[1007] 33; Ex[1016] ¶527. SAP-IS-B says risk cost “[r]eflects the *allocated (standard) risk cost* for the default risk offset against the *actual risk cost (additions minus releases of specific provisions)*. Ex[1007] 90; Ex[1016] ¶527. And deposit protection costs are “lost interest resulting from using the deposit protection systems (e.g. FDIC).” Ex[1007] 90; Ex[1016] ¶527.

SAP-IS-B also discloses provisioning below:

Interest income - Opportunity income = Interest terms contribution - active + Commission income - Commission costs = <i>Commission contribution</i> (subtotal) = <i>Contribution margin I</i> - Standard unit costs - Standard cancellation costs - Equity capital costs = <i>Contribution margin II</i> - Indirect costs = <i>Contribution margin III = market result</i>	- Provisioning
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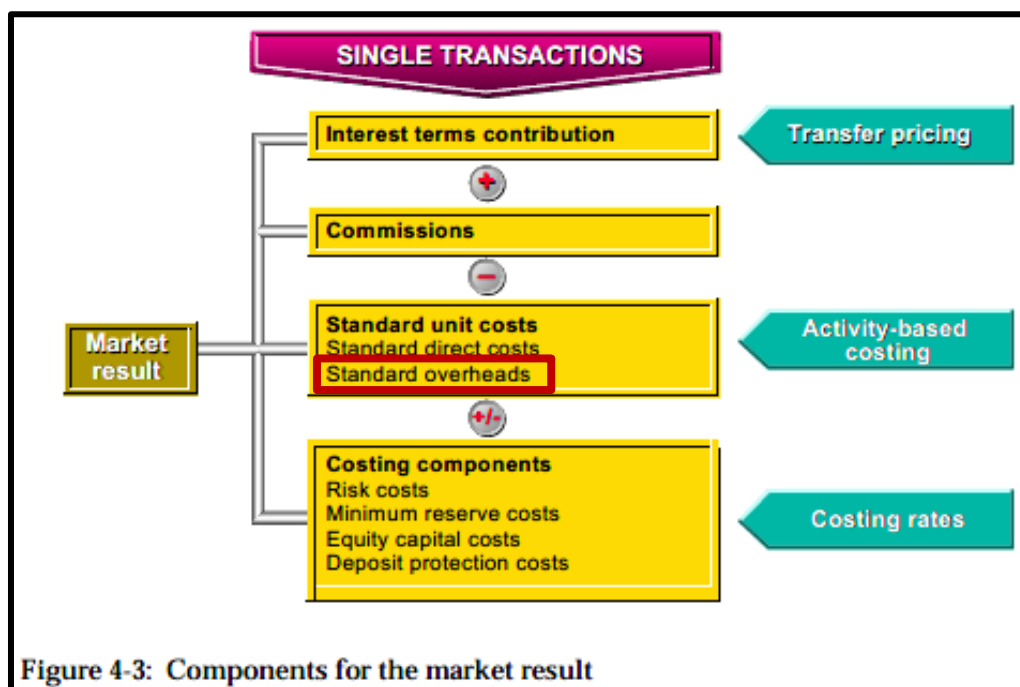
Ex[1007] 63; Ex[1016] ¶528. Here, *SAP-IS-B* calculates provisioning via standard cancellation costs and allocating those costs to a single transaction. Ex[1016] ¶528.

4. Dependent Claim 5

SAP-IS-B teaches Claim 5. Ex[1007] 33, 55-58, 61-64, 86; Ex[1016] ¶¶530-534.

SAP-IS-B discloses calculating indirect expenses as “cost center overhead rates” and “overhead surcharges” by “fully absorb[ing] the cost involved

in a single transaction.” Ex[1007] 54-58; Ex[1016] ¶532. SAP-IS-B shows overheads below:



Ex[1007] 33; Ex[1016] ¶533. Here, indirect expense as “standard overheads” are allocated to a single transaction to calculate profit (market result). Ex[1016] ¶533. This is further shown below:

Interest income					
- Opportunity income					
= Interest terms contribution - active					
+ Commission income					
- Commission costs					
= Commission contribution (subtotal)					
= Contribution margin I					
- Standard unit costs					
- Standard cancellation costs					
- Equity capital costs					
= Contribution margin II					
- Indirect costs					
= Contribution margin III = market result					

Interest Income/Expense
± Opportunity Values (COF/VOF)
(± Equity Capital Costs)
Net Interest

+ Other Revenue

- Direct Expenses

- Direct Expenses

- Provisioning

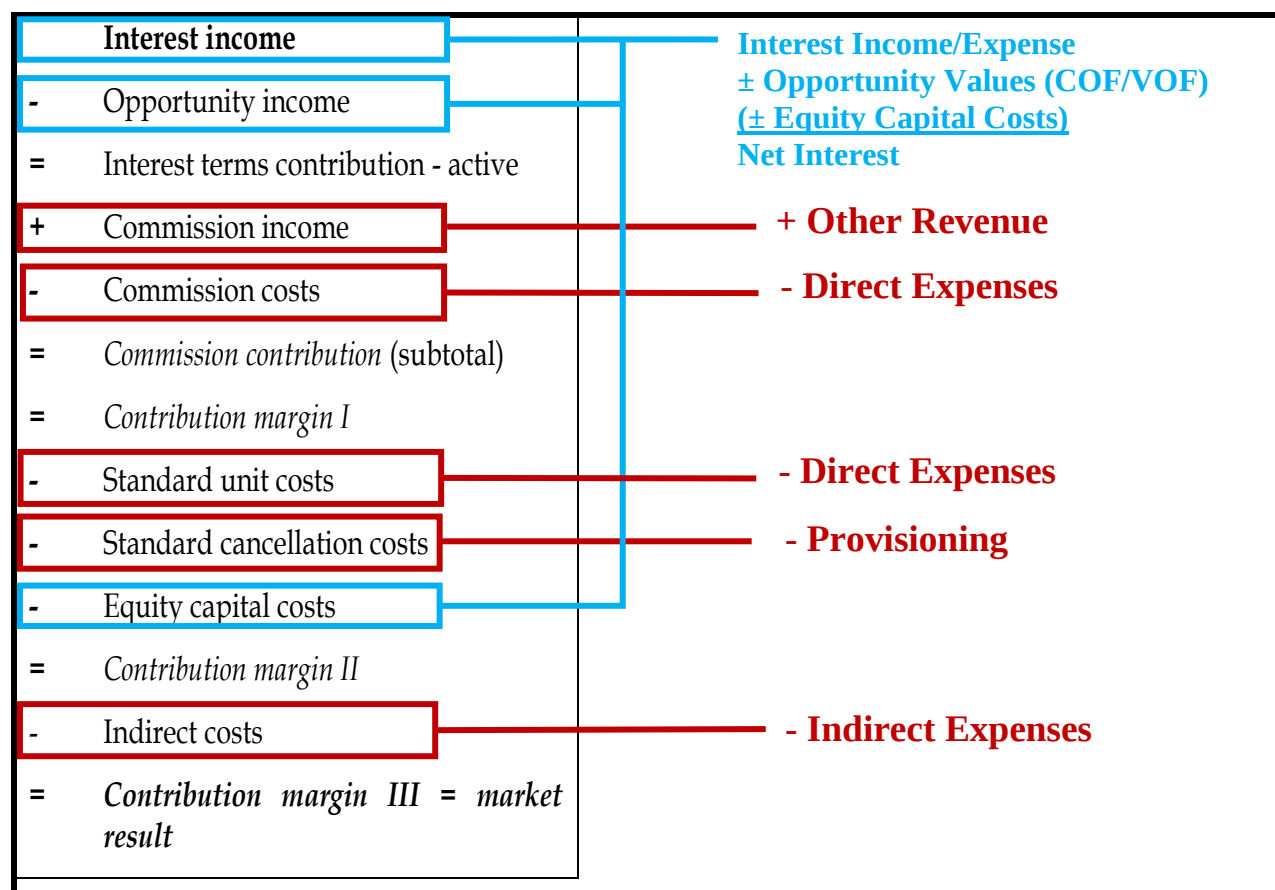
- Indirect Expenses

Ex[1007] 63; Ex[1016] ¶533. Here the indirect expense is “indirect costs” where these costs are allocated to a single transaction. Ex[1016] ¶533.

5. Dependent Claim 6

SAP-IS-B teaches Claim 6. Ex[1007] 33, 61-64; Ex[1016] ¶¶535-537. As discussed above (§§VII.D.1(vi)-VII.D.1(vii), VII.D.3-VII.D.4), SAP-IS-B discloses calculating NI, OR, DE, P, and IE. Ex[1016] ¶¶487-523, 502-534.

SAP-IS-B combines the values of Claim 6 below:



Ex[1007] 63; Ex[1016] ¶536. The figure calculates multiple marginal values of profit by calculating:

- net interest (Interest Income, Opportunity Income, Equity Capital Costs),
- other revenue (Commission Income),
- direct expense (Commission costs, Standard unit costs), and
- provisioning (Standard Cancellation Costs).

with

- a FAPAV, which are the indirect expenses (Indirect Costs),

to create

a measure of object level profitability (market result). Ex[1016] ¶536. The figure also depicts adding net interest and other revenue, and subtracting therefrom direct expense, provisioning, and indirect expense. Ex[1016] ¶536.

The elements of Claims 2 and 4-6 are taught by *SAP-IS-B* (§§VII.D.1-VII.D.5). Additionally, it would have been obvious for a POSITA to combine the well-known concepts (§§VII.A.3-VII.A.4) purportedly claimed with the enterprise database profitability module of *SAP-IS-B* to render the claims obvious. Moreover, a POSITA reading the various teachings and examples of *SAP-IS-B* would at once envisage the claimed arrangements of the challenged claims Ex[1016] ¶543. It would also be obvious to combine the various teachings and examples of *SAP-IS-B* set forth above, as they are all discussed in the single reference and described as desirable approaches, and a POSITA would be motivated to implement the teachings therein in accordance with the examples discussed in *SAP-IS-B*. A POSITA would expect success in carrying out that implementation in view of *SAP-IS-B*'s express teachings, suggestions and motivations set forth above, because it would be common sense when implementing *SAP-IS-B*'s teachings to try utilizing the approaches set forth in *SAP-IS-B*'s example implementations. Ex[1016] ¶543.

E. Grounds 8-9: Claims 2, 4-7, and 25-30 are Rendered Obvious by E&Y and Blain, and also by E&Y, Blain, and SAP-IS-B

The combination of *E&Y* and *Blain* renders obvious Claims 2, 4-7, and 25-30. In addition, the combination of *E&Y*, *Blain*, and *SAP-IS-B* also renders obvious Claims 2, 4-7, and 25-30.

1. Motivation to Combine

A POSITA would be motivated to combine *E&Y* with *Blain*. Ex[1016] ¶¶585-593. It is common sense to combine *E&Y*, whose express purpose is to “assist financial institutions with the design implementation, and management of performance information,” with *Blain*, describing a well-known computer-implemented financial accounting system – SAP-R/3 – for “providing continuous measurement of the profitability of everything that is going on.” Ex[1005] 5; Ex[1006] 193; Ex[1016] ¶¶585-593. Using the SAP-R/3 system of *Blain* to implement the profitability teachings of *E&Y* would be obvious for a POSITA to try due to the prevalence of the SAP system. Ex[1016] ¶¶585-593. Moreover, the SAP-R/3 system of *Blain* was known to POSITAs as an accounting and financial analysis tool and would have been one of a limited number of options when selecting software to implement *E&Y*’s teachings. Ex[1016] ¶¶585-593. Implementing *E&Y*’s teachings using the *Blain* system would also yield predictable results, because *Blain*’s system is designed to calculate the same

profitability metrics, using the same concepts, that E&Y teaches. Ex[1016] ¶¶585-593.

Additionally, E&Y suggests, and provides motivation for, using a system like *Blain* to implement the teachings of E&Y. Ex[1016] ¶¶585-593. For example, as described by Dr. Weber, *E&Y*'s discussion of a “[d]atabase gateway technology,” “scalable client-server processing platforms,” and “packaged software” would be recognized by a POSITA as describing a system like SAP-R/3. Ex[1016] ¶587.

As for *SAP-IS-B*, *Blain* expressly teaches combining SAP-R/3 with the “IS-B Industry Solutions for Banks” explaining that “IS-B is fully compatible with existing R/2 and R/3 installations” and provides “[b]ank profitability analysis.” Ex[1006] 585; Ex[1016] ¶¶594-595. While *Blain* does not describe IS-B's calculations in detail, *SAP-IS-B* provides precisely that implementation detail. *SAP-IS-B* also suggests the combination, describing the installation and integration of the IS-B module into the SAP-R/3 system of *Blain*. Ex[1007] 9-12; Ex[1016] ¶¶594-595. The combination of *Blain* and *SAP-IS-B* is suggested by both references, and the combination would yield predictable results for measuring profitability of a banking institution. Ex[1016] ¶¶594-595.

A POSITA would have also known to combine *E&Y*, a guide on performance measurement in financial institutions, with the SAP module that provides a system for performance measurements in banks as described by *SAP-IS-*

B. Ex[1005] 5; Ex[1016] ¶¶585-595. The combination would yield a predictable result for calculating object level profitability for a financial institution. Ex[1016] ¶¶585-595.

2. Obviousness (E&Y and Blain)

The elements of Claims 2, 4-7, and 25-30 are taught by *E&Y* (VII.B.1-VII.B.12) and the elements of Claims 2, 4-5, and 25 are taught by *Blain* (VII.C.1-VII.C.5). For the reasons discussed above, a POSITA would find it obvious to combine these teachings to render Claims 2, 4-7, and 25-30 obvious.

For example, to the extent it is argued that *Blain* does not teach 1[d], it would have been obvious for a POSITA to use the transfer pricing calculations described in *E&Y* in the *Blain* system, since *Blain* was designed to allow a user to define rules for calculating profitability. Ex[1016] ¶¶590-593. As referenced in §VII.A.3(v), element 1[d] was well-known in the art and it would have been obvious for a POSITA to combine the rules of 1[d] with the cost allocation rules, along with the identification of data in the database, with *Blain* to render 1[d] obvious. Ex[1016] ¶¶135-142, 424-431.

Additionally, to the extent that *E&Y* is alleged to not expressly teach “rules” for its various calculations of values and profitability (1[d]-1[e]), *Blain*’s rules-based database system would be an obvious design choice to implement *E&Y*’s teachings for all the reasons discussed above (§VII.E.1) and because

Blain's system permitted the use of rules to process the data, select objects, and perform calculations about those objects. Ex[1016] ¶¶590-593.

To the extent that it is argued that *E&Y* does not expressly teach SQL according to Claim 2, it would have been obvious to a POSITA to use the financial calculations of *E&Y* with the RDBMS (including SQL) of *Blain* to render Claim 2 obvious, because *Blain* was designed to allow user-defined financial rules in the RDBMS for calculating profitability. Ex[1016] ¶593. Thus, the combination of *E&Y* and *Blain*, renders obvious Claims 2, 4-7, and 25-30.

3. Obviousness (E&Y, Blain, and SAP-IS-B)

The elements of Claims 2, 4-7, and 25-30 are taught by *E&Y* (VII.B.1-VII.B.12), the elements of Claims 2, 4-5, and 25 are taught by *Blain* (VII.C.1-VII.C.5), and the elements Claims 2, and 4-6 are taught by *SAP-IS-B* (VII.D.1-VII.D.5). For the reasons discussed above, a POSITA would find it obvious to combine these teachings to render Claims 2, 4-7, and 25-30 obvious.

Specifically, it would have been obvious to a POSITA to combine the financial calculations of *E&Y* with the enterprise database system of *Blain* and *SAP-IS-B*. §VII.E.1. For example, with respect to Claim 2, it would have been obvious for a POSITA to use an RDBMS with SQL described by *Blain* (VII.C.2) in the *SAP-IS-B* system, since the *SAP-R/3* system of *Blain* was designed to fully integrate with the *IS-B* module of *SAP-IS-B*. §V.C. Similarly, to the extent that it is argued that *E&Y* does not expressly teach establishing rules in the relational

database (1[d]) it would have been obvious to a POSITA to use the financial calculations of *E&Y* with the rules-based system of *SAP-IS-B* (VII.D.1(v)-VII.D.1(vi)) and *Blain* (VII.C.1(v)-VII.C.1(vi)). Ex[1016] ¶¶594-595. As described above, the *SAP-IS-B* system is designed to have users input rules, like those of *E&Y*, into the enterprise system to calculate object level profitability. §V.C. Thus, the combination of *E&Y*, *Blain*, and *SAP-IS-B* renders obvious Claims 2, 4-7, and 25-30.

F. Grounds 10-11: Claim 29 is Rendered Obvious by *E&Y*, *Blain*, and *Kimball*; and *E&Y*, *Blain*, *SAP-IS-B*, and *Kimball*.

1. Claim 29

Kimball discloses that banks have “pressured managers to manage with greater emphasis on *shareholder value*” and that “using *different hurdle rates* addresses the need of *shareholders to be compensated* adequately for the risks they bear.” Ex[1010] 17, 24; Ex[1016] ¶¶574-580. Assigning equity to calculate SVA is the same calculation as EOAE, just applied to the overall profit calculation rather than as a component of net interest income. Ex[1016] ¶¶551-573. *Kimball* discloses the “role of capital as a source of funds” and to “integrate capital into the funds-transfer-pricing system to measure accurately the profitability of a particular business, product, or customer relationship.” Ex[1010]

22; Ex[1016] ¶556. *Kimball* discloses allocating equity based on assigned equity and a transfer rate (hurdle rate). Ex[1010] 22; Ex[1016] ¶¶551-557.

Kimball also discloses assigning equity based on capital allocations of peer businesses and by using CAPM. Ex[1010] 18-19, 22; Ex[1016] ¶¶565-573. *Kimball* discloses that the “most common method of **calculating risk-based hurdle rates is based on the [CAPM]**” where “**beta**” is the “**measure of the riskiness of the individual business.**” *Kimball* discloses calculating SVA by “[m]atch[ing] capital allocations to those of peer businesses” by explaining that a “bank would **construct a peer group for each line of business and allocate capital according to the capital ratios of the peer group.**” Ex[1010] 19; Ex[1016] ¶571.

In terms of the equation of Claim 29, *Kimball* discloses:

Kimball: $SVA(o_i) = \sum 0 + (TransferRate * CapRatio_{peer}) * Balance_{asset}$

'137 Patent: $SVA(o_i) = \sum \alpha(o_i) + \beta(o_i) * Amount(o_i)$

Ex[1016] ¶577. In the equation above, $\alpha(o_i) = 0$, $\beta(o_i) = TransferRate * CapRatio_{peer}$, and $Amount(o_i) = Balance_{asset}$. Ex[1016] ¶577. $\alpha(o_i)$ can be considered to be zero in the same way the '316 Patent, in the airline example, assumes $\alpha(o_i)$ to be zero. Ex[1001] 28:30-33; Ex[1016] ¶577. Additionally, *Kimball* teaches the simple tax calculation of multiplying profit by (1-tax) to calculate after-tax profit:

Exhibit 1

Balance Sheet and Income Statement by Line of Business

(millions of dollars)

	Consumer Deposits	Consumer Lending	Mortgage Banking	Servicing	Commercial Real Estate	Treasury	Total Bank
Assets	3	794	2,182	28	1,357	2,764	7,128
Deposits	6,325	—	3	—	—	800	7,128
Gross interest income	120.2	23.5	—	—	16.1	18.9	178.7
Provision for losses	—	8.0	—	—	7.0	3.2	18.2
Net-interest income	120.2	15.5	—	—	9.1	15.7	160.5
Fees	3.0	3.0	60.1	58	5.2	—	129.5
Total revenue	123.2	18.5	60.1	58	14.3	15.7	289.8
Noninterest expense	97.0	4.9	48.5	55	4.3	1.8	211.5
Net income	26.2	13.6	11.6	3	10.0	13.9	78.3
Taxes	10.5	5.4	4.6	1.2	4.0	5.6	31.3
Net income after tax	15.7	8.2	7.0	1.8	6.0	8.3	47.0

Note: Taxes are assumed to be 40% of net income.

$$26.2 * (1 - 40\%) = 15.7$$

Ex[1010] 18; Ex[1016] ¶579. Thus, *Kimball* teaches the SVA equation of Claim 29. Ex[1016] ¶¶574-580.

2. Motivation to Combine

The combinations of *E&Y* and *Blain*, and *E&Y*, *Blain*, and *SAP-IS-B* (the “primary references”) render obvious the claims from which 29 depends. §VII.E; Ex[1016] ¶¶586-595. A POSITA would have combined the primary references with *Kimball*. Ex[1016] ¶¶586-601. The primary references teach methods of measuring granular organizational performance.

Additionally, a POSITA implementing the profitability systems of the primary references would have looked to banking and accounting publications for the state of the art in profitability calculations. Ex[1016] ¶¶596-601. In fact,

E&Y in Chapter 12 cites an article from the Bank Accounting & Finance journal. Ex[1005] 217; Ex[1016] ¶¶596-601. Dr. *Kimball*'s 1997 paper *Innovations in Performance Measurement in Banking* cites to both *Kimball* and *E&Y*, expressly suggesting their combination. Ex[1019] 16. The primary references discuss allocating equity and a POSITA would look at *Kimball* for details on equity allocation in such a system. Ex[1016] ¶¶596-601.

E&Y discusses “shareholder-value-based...analysis” including equity allocations for “disaggregated business lines, products, and perhaps even transactions.” Ex[1005] 288. *E&Y* suggests looking to references like *Kimball* to address shareholder-value analysis and equity allocations. Ex[1016] ¶¶596-601.

SAP-IS-B discusses “equity capital costs,” and *Kimball* provides detailed rules on calculating equity capital costs. Ex[1016] ¶¶596-601. Combining with *Kimball* would yield the predictable results of calculating object level profitability with equity capital costs (EOAE).

To the extent that *Blain* does not fully disclose transfer pricing formulas, *Kimball* does. §VII.F.1. It is obvious to integrate the calculations of *Kimball* into a user-defined rules-based system of *Blain*, to yield predictable results. Ex[1016] ¶¶424-431.

Similarly, it would have been obvious for a POSITA to implement the formulas of *Kimball* in a user-defined rules-based system of *SAP-IS-B*, to achieve expected results for calculating object level profitability. Ex[1016] ¶¶586-601.

G. Grounds 12-13: Claim 30 is Rendered Obvious by *E&Y, Blain, and McKenzie*; *E&Y, Blain, SAP-IS-B*, and *McKenzie*

As discussed in §VII.A.4(xi), Claim 30's calculation of a two-tier tax is a basic mathematical derivation and thus would have been obvious to a POSITA. Ex[1016] ¶¶581-584. Furthermore, the combination of *E&Y* and *Blain* and the combination of *E&Y, Blain*, and *SAP-IS-B*, teach and render obvious Claim 30. §§VII.B.12, VII.E; Ex[1016] ¶¶401-404. While the mathematical formula for a two-tier tax is obvious, neither *E&Y, Blain*, nor *SAP-IS-B* explicitly state the formula.

McKenzie, however, teaches calculating a two-tiered tax: the first tier being corporate taxes followed by the second tier of dividend tax. Ex[1010] 2-3; Ex[1016] ¶¶581-584. *McKenzie* teaches that the "total effective tax rate" is:

$$\tau = \theta (1 - u) + u$$

- τ = total effective tax rate
- θ = first tier tax rate
- u = second tier tax rate.

Ex[1011] 3; Ex[1016] ¶¶581-584. It would have been obvious in implementing the combination of *E&Y* and *Blain* or *E&Y*, *Blain*, and *SAP-IS-B* to use the teachings of *McKenzie* for calculating a two-tier tax.

1. Motivation to Combine

As discussed above (VII.E.1), it was obvious to use *E&Y* and *Blain* or *E&Y*, *Blain*, and *SAP-IS-B* to create a system to calculate profitability. §VII.E; Ex[1016] ¶582. *McKenzie* is directed to dividend taxation. Considering a business that receives or distributes dividends (i.e. many corporations), it would be obvious to combine *McKenzie*'s dividend taxation calculations with *E&Y* and *Blain* or *E&Y*, *Blain*, and *SAP-IS-B*. Ex[1016] ¶582. For example, *E&Y*, *Blain*, and *SAP-IS-B* discuss calculating taxes generally, and discuss international tax regimes, but leave out details applicable to calculations involving multiple tax rates, such as multiple tax sovereigns, or income/dividend taxation. Ex[1005] 73; Ex[1006] 203-204, 473-477, 559; Ex[1007] 8; Ex[1016] ¶582. *McKenzie* provides those details for dividend taxation, and a POSITA would have applied this known technique to yield predictable results. Ex[1016] ¶582. Additionally, *McKenzie* was catalogued as “Dividends Taxation,” making it obvious to a POSITA to look to *McKenzie* when determining methods of implementing taxation in a profitability system like *E&Y*, *Blain*, or *SAP-IS-B* as applicable to corporations with dividends. Ex[1017] ¶78.

VIII. CONCLUSION

Petitioner respectfully requests that covered business method review of the '316 Patent be instituted and that the challenged claims be cancelled as unpatentable.

Petition for Covered Business Method Review of U.S. Patent No. 8,612,316

Respectfully submitted,

BAKER BOTTS L.L.P.

Date: November 12, 2018

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APPENDIX 1: CLAIM LISTING

Claim Element	Claim Language
1[preamble]	A process for determining object level profitability in a relational database management system, comprising the computer implemented steps of:
1[a]	providing a computerized profit database having profit information;
1[b]	providing a relational database management system operable in association with the computerized profit database;
1[c]	preparing the profit information to be accessed electronically through the relational database management system, including the step of calculating opportunity values for funds used or supplied by each object being measured;
1[d]	establishing, in the relational database, rules for processing the prepared information, including the steps of providing information necessary to select objects and performing a profit calculus;

1[e]	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;
1[f]	combining the at least one marginal value of profit to create a measure for object level profitability.
2	The process of claim 1, wherein the relational database comprises a structured query language (SQL).
3[a]	The process of Claim 1, wherein the step of calculating at least one marginal value of profit includes the steps of calculating net interest (NI), other revenue (OR) and direct expense (DE),
3[b]	wherein net interest (NI) is the summation of interest income, value of funds provided and earnings on equity funds used less the sum of interest expense and costs of funds used,
3[c]	other revenue (OR) is a measure of profit contribution from non-interest related sources, and
3[d]	direct expense (DE) is the profit value reduction due to marginal resource consumption by the object,

3[e]	and indirect expense (IE) due to non-object related resource consumption.
4	The process of claim 1, wherein the step of calculating at least one marginal value of profit includes the step of provisioning (P) for the selected set of prepared information, provisioning being the expected profit value adjustment for future outcomes related to the object.
5	The process of claim 1, including the step of calculating a profit adjustment value by calculating the value for indirect expense (IE) which is an apportioned profit value adjustment for all non-object related resource consumption.
6	The process of claim 5, wherein the combining step includes the steps of adding net interest (NI) and other revenues (OR), and subtracting therefrom direct expense (DE), provisioning (P) and indirect expense (IE).
7	The process of claim 6, including the step of adjusting the measure for object level profitability for taxes and/or object economic value.

8	The process of claim 1, wherein the opportunity values are based on matched maturity funds transfer pricing theory, where the values are market alternative supplies or uses of funds having matched interest and payment characteristics.
9	9. The process of claim 3, wherein the Net Interest (NI) is calculated as: Int Inc(o_i)=Interest Income of object o_i –COF(o_i)=Cost of funds used by object o_i –Int Exp(o_i)=Interest Expense for object o_i +VOF(o_i)=Value of funds provided by object o_i according to: Int Inc(o_i)=AAB(o_i)*rate_{asset}(o_i), only if object attribute doesn't exist; COF(o_i)=AAB(o_i)*Rt Int Exp(o_i)=ALB(o_i)*rate_{liability}(o_i), only if object attribute doesn't exist, and VOF(o_i)=ALB(o_i)*Rt, wherein: AAB(o_i)=Average Asset Balance of the object o_i, ALB(o_i)=Average Liability Balance of the object o_i, rate_{asset}(o_i)=Effective interest rate for object o_i as an asset balance, rate_{liability}(o_i)=Effective interest rate for object o_i as a liability balance, and Rt=Treatment rate based on the identified treatment for the object's product attributes.

10	The process of claim 9, including the step of calculating earnings on allocated equity, where the summation is taken over all asset balances, according to: $EOAE(o_i) - R_{equity} * ER * \Sigma AB_{(asset,t)}(o_i), \text{ wherein:}$ $AB_{(asset,t)}(o_i)$ = Average Asset balances of the object o_i, including any allocated asset balances, ER = Equity Ratio, and R_{equity} = Treatment Rate for equity.
11	The process of claim 9, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) - R_{equity} * \Sigma [Amount(o_i) * W(Wt(o_i)) * Cap \text{ Ratio}], \text{ wherein:}$ $Amount(o_i)$ = Amount(s) associated with object 'a' This may be the average asset balances of the object 'o_i' including any allocated asset balances, or may be an object parameter, $Wt(type(o_i))$ = Code needed to identify the weight for object o balances, at the object-type level, $W(Wt(type(o_i)))$ = determined by the weight code, $Cap \text{ Ratio}$ = An appropriate risk-weighted capital ratio chosen, and R_{equity} = Treatment Rate for equity.

12	The process of claim 9, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) = R_{equity} * E_{cohort}(o)(Amount(o_i)),$ or $\Sigma R_{equity} * [\alpha + \beta * Amount(o_i)]$, wherein: Amount($o_i$)=An amount or amounts related to the object, such as average balances of the object (denoted $AB_{(c,s,t)}(o_i)$, Cohort(o_i)=The cohort of objects in which object o is a member, $E_{cohort}(o_i)$=The equity allocation rule for the cohort of object o, according to a linear (two-valued) function that operates on Amount(o_i) of the form $\alpha + \beta * Amount(o)$, and R_{equity}=Treatment Rate(s) for equity for the Amount(o_i) value(s).
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13	13. The process of claim 3, wherein Net Interest (NI) is calculated as the summations over the possible balance variables for the object, according to: $IntInc(o_i) = \sum_{\forall c,t} AB_{(asset\ c,t)}(o_i) * rate_{(asset\ c,t)}(o_i),$ calculate only if object attribute doesn't exist, $-COF(o_i) = \sum_{\forall c,t} AB_{(asset\ c,t)}(o_i) * R_{(asset\ c,t)}R_{(c,t)}(pt(o))$ $-IntExp(o_i) = \sum_{\forall c,t} AB_{(liability\ c,t)}(o_i) * rate_{(liability\ c,t)}(o_i),$ only if object attribute doesn't exist, $+VOF(o_i) = \sum_{\forall c,t} AB_{(liability\ c,t)}(o_i) * R_{(liability\ c,t)}R_{(c,t)}(pt(o)),$ wherein $AB_{(c,t)}(o_i)$=Average Balances of the object o_i, $rate_{(c,t)}(o_i)$=Effective interest rate for the corresponding balance asset or liability, $Rt(o)$=Object o's product type/group as needed to identify treatment rate, $R_{(c,t)}(pt(o))$=Rate (treatment rate) for objects of this product type/group, given the balance class, and tier, $Int\ Inc(o_i)$=Interest Income of object o_i, $COF(o_i)$=Cost of funds used by object o_i, $Int\ Exp(o_i)$=Interest Expense for object o_i, and $VOF(o_i)$=Value of funds provided by object o_i.
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14	The process of claim 13, including the step of calculating earnings on allocated equity, where the summation is taken over all asset balances, according to: $EOAE(o_i) = R_{equity} * ER * \sum AB_{(asset, i)}(o_i), \text{ wherein:}$ $AB_{(asset, i)}(o_i)$=Average Asset balances of the object o_i, including any allocated asset balances, ER=Equity Ratio, and R_{equity}=Treatment Rate for equity.
15	The process of claim 13, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) = R_{equity} * \sum [Amount(o_i) * W(Wt(o_i)) * Cap \text{ Ratio}], \text{ wherein:}$ $Amount(o_i)$=Amount(s) associated with object ‘a’ This may be the average asset balances of the object ‘o_i’ including any allocated asset balances, or may be an object parameter, $Wt(type(o_i))$=Code needed to identify the weight for object o balances, at the object-type level, $W(Wt(type(o_i)))$=determined by the weight code, $Cap \text{ Ratio}$=An appropriate risk-weighted capital ratio chosen, and R_{equity}=Treatment Rate for equity.

16	The process of claim 13, including the step of calculating earnings on allocated equity according to: $\text{EOAE}(o_i) = \sum R_{\text{equity}} * E_{\text{cohort}}(o) (\text{Amount}(o_i)),$ or $\sum R_{\text{equity}} * [\alpha + \beta * \text{Amount}(o_i)]$, wherein: $\text{Amount}(o_i)$ = An amount or amounts related to the object, such as average balances of the object (denoted $\text{AB}_{(c,s,t)}(o_i)$, $\text{Cohort}(o_i)$ = The cohort of objects in which object o is a member, $E_{\text{cohort}}(o_i)$ = The equity allocation rule for the cohort of object o, according to a linear (two-valued) function that operates on $\text{Amount}(o_i)$ of the form $\alpha + \beta * \text{Amount}(o)$, and R_{equity} = Treatment Rate(s) for equity for the $\text{Amount}(o_i)$ value(s).
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17	17. The process of claim 3, wherein Net Interest (NI) is calculated as the summations over the possible balance attributes for the objects, according to: $IntInc(o_i) = \sum_{\forall c,t} AB_{(asset\ c,t)}(o_i) * rate_{(asset\ c,t)}(o_i), \text{ only if object}$ attribute doesn't exist, $-COF(o_i) = \sum_{\forall c,t} AB_{(asset\ c,t)}(o_i) * R_{(asset\ c,t)}(type_{p,a}(o_i)),$ $-IntExp(o_i) = \sum_{\forall c,t} AB_{(liability\ c,t)}(o_i) * rate_{(liability\ c,t)}(o_i),$ only if object attribute doesn't exist, $+VOF(o_i) = \sum_{\forall c,t} AB_{(liability\ c,t)}(o_i) * R_{(c,t)}(type_{p,a}(o_i)),$ wherein: $AB_{(c,t)}(o_i)$=Average Balances of the object o_i, $rate_{(c,t)}(o_i)$=Effective interest rate for the corresponding balance, $Type_{p,a}(o_i)$=Object o_i's product and object attributes as needed to identify treatment, $R_{(c,t)}(type_{p,a}(o_i))$=Rate (treatment rate) for this object's product type, given the balance class, and tier/tenor, $Int\ Inc\ (o_i)$=Interest Income of object o_i, $COF\ (o_i)$=Cost of funds used by object o_i, $Int\ Exp\ (o_i)$=Interest Expense for object o_i, and $VOF\ (o_i)$=Value of funds provided by object o_i.
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18	The process of claim 17, including the step of calculating earnings on allocated equity, where the summation is taken over all asset balances, according to: $EOAE(o_i) = R_{equity} * ER * \sum AB_{(asset, t)}(o_i), \text{ wherein:}$ $AB_{(asset, t)}(o_i)$=Average Asset balances of the object o_i, including any allocated asset balances, ER=Equity Ratio, and R_{equity}=Treatment Rate for equity.
19	The process of claim 17, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) = R_{equity} * \sum [Amount(o_i) * W(Wt(o_i)) * Cap \text{ Ratio}], \text{ wherein:}$ Amount(o_i)=Amount(s) associated with object ‘a’ This may be the average asset balances of the object ‘o_i’ including any allocated asset balances, or may be an object parameter, Wt(type(o_i))=Code needed to identify the weight for object o balances, at the object-type level, W(Wt(type(o_i)))=determined by the weight code, Cap Ratio=An appropriate risk-weighted capital ratio chosen, and R_{equity}=Treatment Rate for equity.

20	The process of claim 17, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) = \Sigma R_{equity} * E_{cohort}(o)(Amount(o_i)),$ or $\Sigma R_{equity} * [\alpha + \beta * Amount(o_i)]$, wherein: Amount($o_i$)=An amount or amounts related to the object, such as average balances of the object (denoted $AB_{(c,s,t)}(o_i)$, Cohort(o_i)=The cohort of objects in which object o is a member, $E_{cohort}(o_i)$=The equity allocation rule for the cohort of object o, according to a linear (two-valued) function that operates on Amount(o_i) of the form $\alpha + \beta * Amount(o)$, and R_{equity}=Treatment Rate(s) for equity for the Amount(o) value(s).
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21	21. The process of claim 3, wherein Net Interest (NI) is calculated where summations are over the possible balance variables for the object, according to: $\text{Int Inc}(o_i) = \sum AB_{(asset\ c, t)}(o_i) * \text{rate}_{(asset\ c, t)}(o_i)$ only if object attribute doesn't exist, $-\text{COF}(o_i) = \sum AB_{(asset\ c, t)}(o_i) * R_{(asset, t)}(\text{type}_{p, a, b}(o_i))$, $-\text{Int Exp}(o_i) = \sum AB_{(liability, t)}(o_i) * \text{rate}_{(liability, t)}(o_i)$ only if object attribute doesn't exist, $+\text{VOF}(o_i) = \sum AB_{(liability, t)}(o_i) * R_{(liability, t)}(\text{type}_{p, a, b}(o_i))$, wherein: $AB_{(c, t)}(o_i)$ = Average Balances of the object, $\text{rate}_{(c, t)}(o_i)$ = Effective interest rate for the corresponding balance amounts, $\text{type}_{p, a, b}(o_i)$ = Object o_i's product, object attribute, and behavior types as needed to identify treatment rate, $R_{(c, t)}(\text{type}_{p, a, b}(o_i))$ = Rate (treatment rate) for objects of this product type, balance class, and tier/tenor, $\text{Int Inc}(o_i)$ = interest Income of object o_i, $\text{COF}(o_i)$ = Cost of funds used by object o_i, $\text{Int Exp}(o_i)$ = Interest Expense for object o_i, and $\text{VOF}(o_i)$ = Value of funds provided by object o_i.
22	The process of claim 21, including the step of calculating earnings on allocated equity, where the summation is taken over all asset balances, according to: $\text{EOAE}(o_i) = R_{equity} * \text{ER} * \sum AB_{(asset, t)}(o_i)$, wherein: $AB_{(asset, t)}(o_i)$ = Average Asset balances of the object o_i, including any allocated asset balances, ER = Equity Ratio, and R_{equity} = Treatment Rate for equity.

23	The process of claim 21, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) = R_{equity} * \sum [Amount(o_i) * W(Wt(o_i)) * Cap Ratio], \text{ wherein:}$ Amount(o_i)=Amount(s) associated with object ‘a’ This may be the average asset balances of the object ‘o_i’ including any allocated asset balances, or may be an object parameter, Wt(type(o_i))=Code needed to identify the weight for object o balances, at the object-type level, W(Wt(type(o_i)))=determined by the weight code, Cap Ratio=An appropriate risk-weighted capital ratio chosen, and R_{equity}=Treatment Rate for equity.
24	The process of claim 21, including the step of calculating earnings on allocated equity according to: $EOAE(o_i) = \sum R_{equity} * E_{cohort}(o)(Amount(o_i)),$ or $\sum R_{equity} * [\alpha + \beta * Amount(o_i)], \text{ wherein:}$ Amount(o_i)=An amount or amounts related to the object, such as average balances of the object (denoted $AB_{(c,s,t)}(o_i)$, Cohort(o_i)=The cohort of objects in which object o is a member, $E_{cohort}(o_i)$=The equity allocation rule for the cohort of object o, according to a linear (two-valued) function that operates on Amount(o_i) of the form $\alpha + \beta * Amount(o)$, and R_{equity}=Treatment Rate(s) for equity for the Amount(o_i) value(s).

25

The process of claim 5, wherein the value for indirect expense (IE) is calculated as:

$$\text{before deferral } IE(o_i) = IE_k * \frac{F(IE_k)(o_i)}{\sum_{i \in O(IE)} F(IE_k)(o_i)}$$

added over each set IE_k to
which o_i is related,

$$= \sum_k^{o \in O(IE)} \left(IE_k * \frac{F(IE_k)(o_i)}{\sum_j^{o_j \in O(IE)} F(IE_k)(o_j)} \right)$$

and each of these terms is deferred over its amortization period according to any of the amortization rules (cash, straight line, declining balance, or interest amortization calculations), and where $AM_1(L, R)$ is used to denote the amortization rule and its life:

$$IE(o_i) = \sum_k^{o_i \in O(IE)} AM_1(L, R) \left(IE_k * \frac{F(IE_k)(o_i)}{\sum_j^{o_j \in O(IE)} F(IE_k)(o_j)} \right),$$

and

the result increased by the amounts with remaining amortization life for which amortization was begun in earlier periods.

26	The process of claim 4, provisioning (P) of each object is calculated according to: $P(o_i) = PG(o_i) * \frac{\text{Balance of } o_i}{\sum_{o_k \in RPG(o_i)} \text{Balance } o_k}, \text{ wherein}$ PG(o_i) denotes the P group in which o_i is a member.
27	The process of claim 4, wherein provisioning (P) is calculated as: $P(o_i) = PG(o_i) * \frac{\text{Balance } (o_i) * RF(o_i)}{\sum_{o_k \in RPG(o_i)} [\text{Balance } (o_k) * RF(o_k)]},$ wherein: PG(o_i) denotes the P group in which o_i is a member, and RF(o_i) denotes the expected adjustment factor for o_i.

28	The process of claim 4, wherein provisioning (P) is calculated as: $P(o_i) = \text{Exposure}(o_i) * \text{Pr}(o_i) * \text{Expected Value Adjustment}(o_i) * \frac{1}{L},$ wherein: $\text{Pr}(o_i)$ is a probability for object o_i, and L is the expected number of reporting periods during the life of o_i.
29	The process of claim 7, wherein the step of adjusting the measure for object level profitability is calculated as: $\text{Profit}(o_i) = \{ [\text{NIR}(o_i) + \text{OR}(o_i) - \text{DE}(o_i) - \text{IE}(o_i) - \text{P}(o_i)] * (1 - \text{EffectiveTaxRate}) \} - \text{SVA}(o_i),$ where $\text{SVA}(o_i) = \alpha(o_i) + \beta(o_i) * \text{Amount}(oit),$ and $\alpha(o_i)$, $\beta(o_i)$ are functions for a cohort of objects in which o_i is a member, and $\text{Amount}(o_i)$ is given by a rule which maps o_i to a data value (such as balance, or allocated equity) also defined at the cohort level.

30	The process of claim 7, wherein the step of adjusting the measure for object level profitability includes the calculation: $\text{Profit}(o_i)=[\text{NIR}(o_i)+\text{OR}(o_i)-\text{DE}(o_i)-\text{IE}(o_i)-\text{P}(o_i)]*(1-\text{EffectiveTaxRate})$ where, for a two tier taxation system, Effective Tax Rate is calculated as: $\text{Effective Tax Rate}=(1-\text{tax rate } 2)*(\text{tax rate } 1)+\text{tax rate } 2.$
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CERTIFICATION UNDER 37 C.F.R. §42.24(d)

Pursuant to 37 C.F.R. §42.24(d), the undersigned hereby certifies that the word count under §42.24(a)(1) for the foregoing Petition for Covered Business Method Review totals 18,326 words, within the 18,700-word limit allowed under §42.24(a)(1)(iii).

Date: November 12, 2018

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CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. §§ 42.6(e) and 42.105, the undersigned certifies that on November 12, 2018, a complete and entire copy of **the PETITION FOR COVERED BUSINESS METHOD REVIEW OF CLAIMS 2, 4-7, and 25-30 OF U.S. PATENT NO. 8,612,316 UNDER U.S.C. § 321, and § 28 OF THE LEAHY-SMITH AMERICA INVENTS ACT** (“Petition”), including all supporting exhibits and testimony relied upon were served on the patent owner at the correspondence address of record for the subject patent:

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