IN THE UNITED STATES PATENT TRIAL AND APPEAL BOARD

In re *Post-Grant Review* of:)	
)	
U.S. Patent No. 6,553,350)	U.S. Class: 705/20
)	
Issued: April 22, 2003)	Group Art Unit: 3628
)	
Inventor: Thomas J. CARTER III)	Confirmation No. 5578
)	
Application No.: 09/253,427)	
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Filed: February 19, 1999)	
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For: METHOD AND APPARATUS)	PER 37 C.F.R. § 42.6(b)
FOR PRICING PRODUCTS IN)	
MULTI-LEVEL PRODUCT AND)	
ORGANIZATIONAL GROUPS)	

Mail Stop *Patent Board* (37 C.F.R. § 42.6(b)(2))
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<u>DECLARATION OF MICHAEL SIEGEL, Ph.D.</u>

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I. Background and Qualifications

(1)   My name is Michael Siegel. I am a Principal Research Scientist in the Information Technology Group at the Sloan School of Management. I am currently the Co-Director of the Productivity from Information Technology (PROFIT) Project at MIT. I have also been a Senior Lecturer at the Sloan School of Management.

(2)   I have been a research faculty member in MIT's Information Technologies Group for more than twenty-two years. I have also been co-director of MIT's International Finance Research Center, a Senior Lecturer for courses in Finance and Information Technology, and the Director of the Digital Health Special Interest Group at the MIT Center for Digital Business.

(3)   I hold degrees in Engineering (B.S. and M.S.) from Trinity College (Hartford, CT) and University of Wisconsin (Madison) respectively, and Computer Science (M.A. and Ph.D.) from Boston University. In addition to my more than twenty years on the research faculty at MIT, I have been a Visiting Professor at Northeastern University, a Research Associate at Boston University, and a Research Assistant at the Solar Energy Laboratory at the University of Wisconsin at Madison.

(4)   I have researched and lectured extensively on subjects relating to information technologies, information integration, and management of information

systems. I have been performing research in the area of intelligent integration of information systems and providing new methods for integrating information from disparate sources. I am the author or co-author of over 70 related journal articles and reports.

(5)   My research has been applied to a number of business areas including but not limited to Financial Services, Digital Business, Healthcare, Cybersecurity and International Relations, Software Development and Maintenance, Systems Integration, and Risk Management. In addition, I have successfully obtained funding in these areas to maintain several active research groups at MIT.

(6)   I have extensive experience in Financial Services. For example, my work in Financial Services on benchmarking commercial Value-at-Risk software systems has been well-received by academics, practitioners, and regulators (e.g., national and international agencies).

(7)   I have worked extensively on issues related to the integration of information. In particular I have looked at systems where the meaning of data may differ for example between applications and between sources and users. I have looked at numerous solutions to the processing and movement of information where the meaning may change or be significant in the operations performed on that data. I have had numerous publications on issues around metadata, data semantics and context mediation. These publications are listed in my CV.

(8)   As a Principal Research Scientist at the Sloan School of Management, I have focused on many issues that combine the use of information technology with business strategy and operations. I have developed algorithms, systems, and applications related to the integration of information from disparate systems. I have supervised numerous theses related to these topics.

(9)   I am the co-inventor on three patents related to extraction and integration of information:

- U.S. Patent No. 6,282,537, entitled "Querying and Retrieving Semi-Structured Data from Heterogeneous Sources by Translating Structured Queries." This patent issued in 2001.

- U.S. Patent No. 5,913,214, entitled "Data Extraction from World Wide Web Pages." This patent issued in 1999.

- U.S. Patent No. 5,953,716, entitled "Querying Heterogeneous Data Sources Distributed over a Network Using Context Interchange." This patent issued in 1999.

(10)   I have had a number of consulting roles. These roles have included the development of financial reporting systems, information integration across organizations, analysis of systems integration in large foreign exchange trading systems, patent and software litigation (including banking software), and human resources software.

(11) A copy of my C.V. is attached as Appendix A and includes a list of my publications.

II. My Status as an Independent Expert Witness

(12) I have been retained in this matter by Oblon, Spivak, McClelland, Maier, & Neustadt, L.L.P. ("Oblon Spivak") to provide various opinions regarding U.S. Patent No. 6,553,350 (hereinafter referred to as the "'350 patent"). I am being compensated at the rate of $750 per hour for my work. My fee is not contingent on the outcome of this matter or on any of the opinions I provide below.

(13) I have been advised that Oblon Spivak represents SAP in this matter. I have no financial interest in SAP. However, I should note that SAP is a founding sponsor of the MIT Center for Digital Business ("founding" relates to sponsorship level). As a result of the sponsorship, SAP can choose one or more research projects with faculty members. I was a Principal Investigator for one such project with SAP starting in July of 2010. My role as Principal Investigator and any research project with SAP ended in December 2011. As has been the practice with other projects, I was able to use any residual funding without any obligation, of which a small amount remains.

(14) I have been advised that Versata Software, Inc. (hereinafter referred to as "Versata") owns the '350 patent. I have no financial interest in Versata or the

'350 patent nor have I ever had any contact with Versata, its predecessor Trilogy, or the inventor of the '350 patent, Thomas J. Carter.

III. Description of the Relevant Field and the Relevant Timeframe

(15)   I have reviewed the '350 patent, its file history as well as the file history of the related U.S. Patent No. 5,878,400 (the "'400 patent"). Moreover, I have reviewed various documents from the litigation in the U.S. District Court for the Eastern District of Texas styled *Versata Software, Inc. v. SAP America, Inc.*, Civil Action No. 2:07-cv-153 (hereinafter, the "district court litigation"). For convenience, all of the information that I considered in arriving at my opinions is listed in Appendix B.

(16)   Based on my review of these materials, I believe that the relevant field for purposes of the '350 patent is computerized financial systems. I have been advised that the relevant timeframe is June 1995.

(17)   As described in Section I above, I have extensive experience in the relevant field. Based on my experience, I have a very good understanding of the relevant field in the relevant timeframe.

IV. The Person of Ordinary Skill in the Relevant Field in the Relevant Timeframe

(18)   I have been advised that "a person of ordinary skill in the relevant field" is a mythical person to whom an expert in the relevant field could assign a

routine task with reasonable confidence that the task would be successfully carried out. In my opinion, a person of ordinary skill in the relevant field in June 1995 would have had at least a Bachelor's degree in computer science and two years of experience developing computerized financial systems or, alternatively, a Master's degree in computer science and one year of experience developing computerized financial systems.

(19) Based on my experience, I have a good understanding of the capabilities of a person of ordinary skill in the relevant filed. I have supervised and directed many such persons over the course of my career.

V. Background of the Technology

(20) The central concept to the '350 patent is hierarchies and the hierarchical arrangement of data. This concept, however, has a long and storied history.

(21) Hierarchies (taxonomies, classifications) have been used for thousands of years for organizing groups. Many credit Aristotle (384 - 322 B.C.), a philosopher of ancient Greece, as the first to create a systematic biology by considering nature as ordered classes (classification) from lower to higher. The order was known as the "steps of nature," or the "hierarchy of nature."

(22) Many years later, Carl von Linne (1707-1778), molded the history of classifications into the modern theory of his research in *The System of*

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Nature (1735). Linne roughly classified living beings into "classes," each class into "orders," each order into "genera," and each genus into "species."

(23) Another example a hundred fifty years later was the introduction of the Dewey Decimal Classification (DDC) system conceived by Melvil Dewey in 1873 and first published in 1876. The introduction of computer systems made it easier to store, manage and use classification systems.

(24) Many computer programming languages have constructs for building hierarchies (e.g., arrays, lists). Object languages were introduced as early as the 1960s but became more defined in the 1970s as the use of classes and subclasses became common practice. Also in the 1960s, the Hierarchical Data Model and associated Hierarchical Database was introduced by IBM. Another form of storing and manipulating hierarchical data was introduced with Object-Oriented Database Systems in the 1980s. Inheritance was considered an important aspect of all object-oriented systems. Graphical systems for manipulating hierarchies of classes became commonplace.

(25) The use of organizational and product groups has become well understood over many years of classification science. Many computer-based approaches have been developed for maintaining hierarchies. Inheritance between classes and superclasses is well understood. Overwriting values from superclasses

with those in a subclass is also well-defined and a common practice. In short, the '350 patent's hierarchical arrangement of data is not new.

VI. The '350 Patent

A. Hierarchical Arrangement of Data

(26) The '350 patent defines the alleged invention as "a method and apparatus for determining prices for various products offered to various purchasing organizations." Exh. 1001, Col. 3:10-12.

(27) To determine these prices, the patent explains, "the invention operates under a paradigm of WHO (the purchasing organization) is buying WHAT (the product)." Exh. 1001, Col. 3:24-25. According to the patent, the WHO/WHAT paradigm is not new. Prior art pricing systems used price tables, such as the table illustrated in Figure 1 of the patent, designating "WHO" and "WHAT." Exh. 1001, Col. 2:27-42.

FIG. 1
PRIOR ART

WHAT⟍ WHO	486/33 CPU	486/50 CPU	486/66 CPU
ADAM	$40	$60	$80
BOB	$42	$58	$72
CHARLIE	$44	$68	$92

(28)   In Figure 1, "[e]ach row in the table designates a potential customer that the product would be sold to, and each column designates the product will be sold, and the table entry corresponding to the basic unadjusted price for the product." Exh. 1001, Col. 2:30-34. In the prior art, other tables would store pricing adjustment data such as taxes, shipping charges, currency conversions, and discounts. Exh. 1001, Col. 2:3-6, Fig. 2. The patent contends that by organizing pricing data in this way, prior art systems required large tables that could grow to billions of entries. Exh. 1001, Col. 1:52-2:9.

(29)   To solve this problem, the purported invention arranges customer and product data differently. Rather than organizing customers ("WHO") in rows in a table like the prior art, the patent defines the "WHO" by arranging customers (i.e., purchasing organizations) into a hierarchy of customer groups. Exh. 1001, Col. 3:25-32, 6:1-39. This reorganization of customer data is depicted in Figure 4A of the patent:

FIG. 4A

9
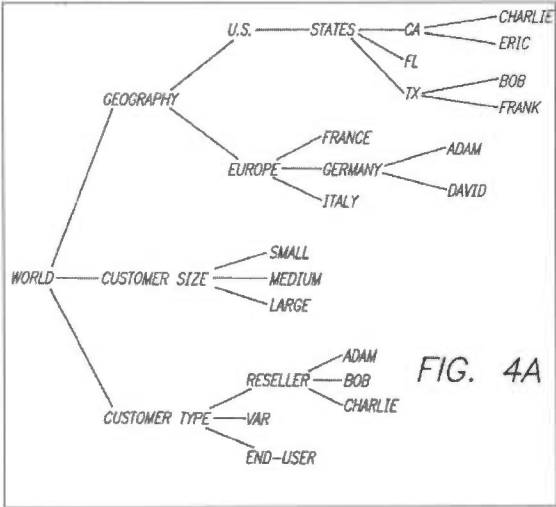
(30)   And rather than organizing products ("WHAT") in table columns like the prior art, the patent describes grouping products into a product group hierarchy. Exh. 1001, Col. 3:42-46, 7:50-67. This rearrangement of product data is depicted in Figure 4B of the patent:

FIG. 4B

HARDWARE
- STORAGE DEVICES
  - HARD DRIVE
  - RAM
  - FLOPPY DRIVE
- CPU
  - 386
  - 486
    - 486/33
    - 486/50
    - 486/66
  - PENTIUM

ALL PRODUCTS — SOFTWARE
- UTILITY
- APPLICATION
- OPERATING SYSTEM

SUPPORT
- MAINTENANCE
- CONSULTING
- UPGRADES
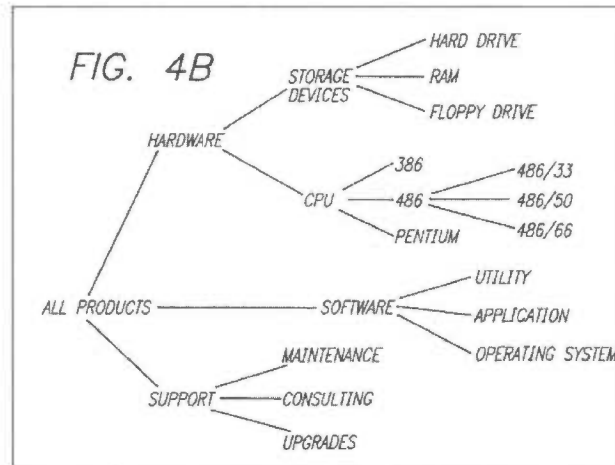
(31)   These hierarchical arrangements of customer and product information are used to determine pricing adjustments for a particular sale, and the pricing adjustments are applied to determine a final price. Exh. 1001, Col. 3:50-65.

(32)   According to the patent, these hierarchical arrangements of customer and product information distinguish the alleged invention from the prior art. Exh. 1001, Col. 6:37-39, 7:67-8:2.

(33)   By arranging the pricing data in hierarchies instead of tables, the patent claims several advantages over the prior art. With multiple tables, prior art systems required "a number of price adjustment tables and a number of database queries to retrieve applicable price adjustments." Exh. 1001, Col. 2:55-63. In

contrast, "the method and apparatus of the present invention . . . overcome the prior art's need to store, maintain, and retrieve huge amounts of data required to determine prices for various products offered to various purchasing organizations while applying a large number of price adjustments." Exh. 1001, Col. 4:4-9.

(34)   Prior art systems that arranged data in multiple tables were inflexible, according to the patent. For example, "the prior art pricing systems had to store, update and retrieve a separate price adjustment for each purchaser based on the currency exchange rate for that purchaser's particular geographic location." Exh. 1001, Col. 7:35-39. When a currency rate changes, prior art systems must update data in several different tables. Exh. 1001, Col. 7:39-41. When customer data is organized in hierarchies, the purported invention requires only one table to store changes in currency exchange rates. Exh. 1001, Col. 7:44-49.

(35)   I have been advised that the patent owner, Versata Software, has explained that the inventor perceived a widespread problem in the way prior art systems organized data and devised a way to reorganize pricing data. According to the inventor, "[t]he conventional thinking was that different types of data . . . should be segregated and stored in different tables, which appears orderly from a human perspective." Brief of Plaintiffs-Cross Appellants at 4, *Versata Software, Inc. v. SAP America, Inc.*, No. 2012-1029, -1049 (Fed. Cir. May 29, 2012) (Exh. 1011). He realized that "changing the conventional thinking could lead to vast

improvement, and he invented a pricing engine that leveraged the hierarchical data structures used by large corporations to organize pricing information." Exh. 1011 at 5.

B. "Denormalized" Numbers

(36) Another purported distinction over the prior art is the type of numbers used for price adjustments. The patent explains that in addition to "WHO" and "WHAT" data hierarchies, "HOW MUCH" numbers are used to arrive at a price adjustment, as shown in Figure 5 of the patent. Exh. 1001, Col. 10:45-47.

FIG. 5
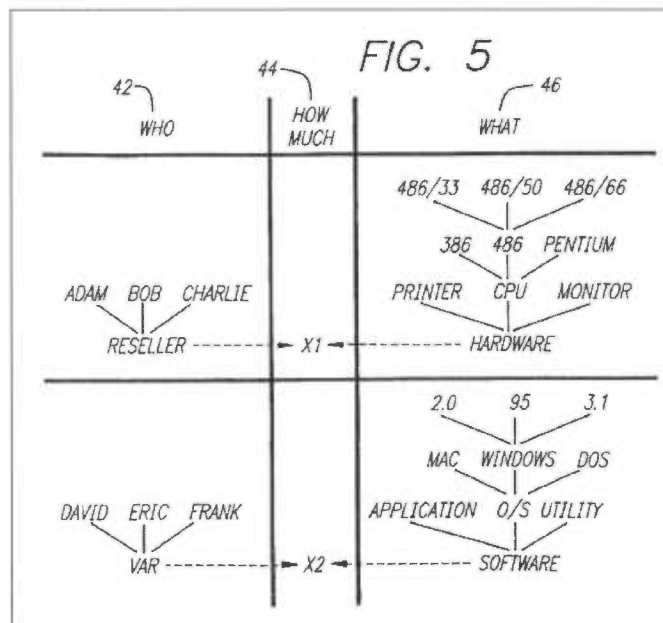
(37) The patent explains: "[C]olumn 44 is labeled as a 'how much' column. The numbers in this column are used to arrive at a price adjustment. The numbers in this column are 'denormalized,' meaning that each number in this column has a unique significance. In other words, a number in this column could refer to a basic

price, or an adjustment to the basic price such as a tax rate, a shipping charge, a currency conversion rate, or various discounts applicable to the base price." Exh. 1001, Col. 10:45-54.

(38)   The use of "denormalized" numbers purportedly provides advantages over the prior art. Exh. 1001, Col. 10:53-54. For example, the patent explains that "the numbers in prior art tables are 'abstracted' and stored as a denormalized number in the 'how much' column (i.e., column 44 in FIG. 5), and the interpretation of those numbers are left up to the interpretation engine of the present invention." Exh. 1001, Col. 11:19-24. Furthermore, "[t]his dynamic interpretation of abstracted numbers during run time along with the invention's feature permitting a user to flexibly specify and change product and organizational groups is in contrast to the static nature of the prior art pricing systems." Exh. 1001, Col. 11:24-28.

(39)   The patent explains that rearranging customer and product data and using "abstracted" numbers are key improvements. "Fig. 5 illustrates that the invention greatly simplifies the prior art tables in at least two ways. First, products and organizations are categorized in different product and organizational groups. Second, the various product and organizational groups are associated with denormalized numbers whose interpretation is determined during run time." Exh. 1001, Col. 11:48-54.

VII. Invalidity Under 35 U.S.C. §101

A.   Requirements for Patent-Eligibility

(40)   I have been advised that the Supreme Court has ruled that laws of nature, abstract ideas and natural phenomena are not patentable. *Mayo v. Prometheus*, 566 U.S. ___, slip op. at 1 (2012).

(41)   I have been advised that the Supreme Court has explained that an "application" of an abstract idea, such as a mathematical formula, may be patent-eligible, if the patent claims add "significantly more" than routine, conventional activity to the underlying concept. *Mayo*, slip op. at 2-4.

(42)   I have been advised that the Supreme Court has explained that an "important and useful clue" to patent-eligibility is whether a claim is "tied to a particular machine or apparatus" or "transforms a particular article into a different state or thing," the so-called machine-or-transformation test. *Bilski v. Kappos*, 130 S. Ct. 3218, 3225-26 (2010). I have been advised that the Supreme Court has explained that the machine-or-transformation test is not the only test for patent-eligibility. *Bilski*, 130 S. Ct. at 3227.

(43)   In my opinion, claims 17, 26, 27, 28, and 29 of the '350 patent do not satisfy these requirements for patent-eligibility, for the reasons discussed below.

B.   Abstract Ideas with Only Routine, Conventional Activity Added

(44)   In my opinion, claims 17, 26, 27, 28, and 29 include the abstract ideas of rearranging pricing data into hierarchies and calculating a product price using "abstracted" numbers, as discussed above. The patent stresses that the purported invention "results in an efficient storage, management and retrieval of pricing data and generation of price recommendations." Exh. 1001, Col. 8:37-39.

(45)   The patent explains that organizing pricing data into hierarchies is performed by a person. While the patent claims that organizing pricing data into hierarchies rather than tables "has significant advantages over the prior art pricing systems," it admits that the customer hierarchies are "wholly arbitrary" and "determined by a user of the invention's pricing system." Exh. 1001, Col. 6:32-39. Likewise, product groupings are "entirely arbitrary and determined by the user." Exh. 1001, Col. 7:64-67, 12:14-17.

(46)   Nothing in claims 17, 26, 27, 28, and 29 adds anything but conventional, well-known activities to these abstract ideas.

(47)   Organizing data in hierarchies has been performed long before the '350 patent was filed. For example, companies have manually organized data in hierarchies, such as organizational management charts, for years.

(48)   Organizing pricing data into groups and using grouped pricing information to determine a product price was likewise performed manually long before the '350 patent was filed. For example, hotels have long offered price discounts for members of groups such as travel club members, senior citizens, and frequent guests. When a guest calls to make a hotel reservation, the hotel clerk may ask which group or groups the guest belongs to, determine the discounts available for the appropriate group or groups, and then offer the lowest price to the guest.

(49)   In my opinion, the addition of only routine, conventional activities to the abstract ideas of reorganizing pricing data in a hierarchy and calculating a product price is insufficient to render claims 17, 26, 27, 28, and 29 patent-eligible.

C.   "Particular Machine" Test

(50)   The patent repeatedly explains that the purported invention can be implemented on *any* type of computer system. According to the patent, "[t]he present invention may be implemented on any conventional or general purpose computer system." Exh. 1001, Col. 5:8-9. The other mentions of computers in the specification, discussed below, confirm that no special computer or other machine is involved. Thus, in my opinion, nothing in claims 17, 26, 27, 28, and 29 indicates a tie to any particular machine.

(51)   The patent includes an "example of a computer system used to generate price recommendations according to the present invention" in Figure 3:
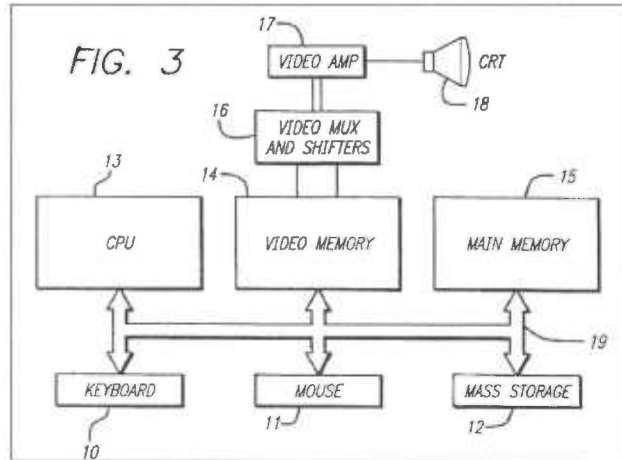
(52)   This example of a computer system is described in column 5 of the patent, but nothing in the figure or the accompanying text indicates any technical requirements or specific details about any particular machine. Instead, the patent explains that this computer system is "for purposes of example only" and that "[t]he present invention may be implemented in any type of computer system or programming or processing environment." Exh. 1001, Col. 5:55-58.

(53)   Claims 17, 26, 27, 28, and 29 describe, either directly or indirectly, a "data source" and the patent explains that the purported invention reduces the number of "database queries" needed to determine a price. Exh. 1001, Col. 11:37-12:3. The terms "data source" and "database" do not imply a tie to any particular machine. Instead, the patent explains that "although the invention is discussed in

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terms of a 'database,' the invention can be implemented using any data source that

may be different from a conventional database." Exh. 1001, Col. 10:59-61.

(54) The patent uses the phrase "interpretation engine" when discussing

denormalized numbers. For example, the patent states that the interpretation of

denormalized numbers is "determined during run time" by "the interpretation

engine of the present invention." Exh. 1001, Col. 11:17-24. But the patent does

not describe in any detail what the "interpretation engine" is or how it operates.

Nothing in the patent's brief mention of an "interpretation engine" indicates any

involvement of a particular machine.

(55) The patent includes Figures 6-14, described as "computer screens

according to the present invention." Exh. 1001, Col. 4:33-60. None of these

figures, however, indicates a tie to any particular machine. Instead, the "computer

screens" depict the pricing data arrangements in a different way. For example,

"FIG 9 is an example of a computer screen according to the invention which

corresponds to the table of Fig. 5." Exh. 1001, Col. 16:34-36. Neither the

"computer screens" nor the corresponding data tables indicate the involvement of

any particular computer.

(56) Although called "computer screens," the patent explains that these

figures show actions performed by a *user*, not a computer. For example, the patent

explains that Figure 6 demonstrates how "a user can arbitrarily select the different

grouping of the organizations" by selecting a folder icon, determining where an organizational group is to be placed in a hierarchy, and creating new branches in the hierarchy. Exh. 1001, Col. 13:20-14:3. Likewise, the patent explains that Figure 7 illustrates how a user specifies pricing types and creates new pricing types by clicking on an icon. Exh. 1001, Col. 14:4-65. The same is true for Figure 8 (e.g., Col. 15:53-67, "pricing sequence can be designated by the user"), Figure 9 (e.g., Col. 16:36-55, "the user selects a specific customer" then "the user selects a Pricing Type"), Figure 10 (e.g., Col. 16:59-17:5, "user specifies that the product group to which Product A belongs I Storage Devices group"), Figure 11 (e.g., Col. 17:6-18, "user can specify the organizational group for a specified customer"), Fig. 12 (e.g., Col. 17:19-67, "the computer screen in Fig. 12 permits a user to specify various price adjustments"), Figure 13 (e.g., Col. 18:3-29, "user then places the geographic designation 'California' in box 1304), and Figure 14 (e.g., Col. 18:30-52, "user then specifies that the applicable tax rate for the "Support" group is 0%). These figures and the accompanying text describe actions performed by a person and do not require any particular type of machine or computer.

D.   "Transformation" Test

(57)   In my opinion, nothing in claims 17, 26, 27, 28, and 29 transforms an article into a different state or thing.

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(58)   The claims recite various actions involving financial data, such as storing pricing information, retrieving applicable pricing information, and determining a product price. These and the other claimed steps operate on financial information, not any physical articles.

(59)   I have been advised that courts have ruled that patent claims that organize financial information such as credit card numbers do not satisfy the transformation test. *CyberSource v. Retail Decisions*, Slip op. at 8-9. I have also been advised that courts have ruled that patent claims that calculate the financial value of insurance policies do not effect a patent-eligible transformation. *Bancorp Services v. Sun Life*, Slip op. 20-21. Accordingly, it is my opinion that claims 17, 26, 27, 28, and 29 do not satisfy the transformation test.

VIII. Invalidity under 35 U.S.C. §112

(60)   I have been advised that a patent specification must contain a "written description" of the claimed invention. 35 U.S.C. § 112, ¶ 1. I have also been advised that the claims of an issued patent must particularly point out and distinctly claim the subject matter of the alleged invention. 35 U.S.C. § 112, ¶ 2.

A.   Claims 17 and 26-29 lack written description

(61)   In order to comply with the written description requirement, the inventor must describe the invention sufficiently to show that he or she is in possession of the invention. 35 U.S.C. § 112, ¶ 1.

1.   The Software Claims of the '350 Patent are not Supported by the Specification

(62)   The Specification fails to explain how the claimed software operates. Instead, the Specification focuses on the user's ability to interact with a graphical user interface, without providing any detail as to how the functions would be implemented in software. *See* Section VII.C, *supra*.

(63)   Even the few sections of the Specification related to the underlying systems fail to describe the functions performed by the software. "For example, as shown in Fig. 5, the invention first determines that the purchaser (Adam) is a Reseller." "The invention then determines that a 486/33 CPU belongs to the category of 486 CPU's belong to the category of CPU's, and that CPU's belong to the category of Hardware." Exh. 1001, Col. 9:44-47 and 50-53. As previously noted, the patent explains that these hierarchies are "wholly arbitrary" and "determined by a user of the invention's pricing system." Exh. 1001, Col. 6:32-39; see also Exh. 1001, Col. 7:64-67, 12:14-17. Although the patent mentions that the invention "determines" that Adam is a Reseller and that the 486 CPU's belong to the category of CPU's, which belong to the category of Hardware, the patent includes no discussion of how the software might operate or otherwise makes those determinations.

(64)   The Specification also discusses that treatment of denormalized number is "determined during run time" by "the interpretation engine of the

present invention." Exh. 1001, Col. 11:17-24. But it does not describe in any detail what the "interpretation engine" is or how it works.

B.   Claims 17, 26, 28, and 29 are Indefinite

(65)   In order to satisfy the definiteness requirement, I have been advised that a patent's specification must conclude with one or more claims "particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention," (35 U.S.C. § 112, ¶ 1) and that the claims of the patent must provide fair notice of the subject matter that is encompassed and the subject matter that is not encompassed by the claimed invention, so that one of ordinary skill in the art can "understand the bounds of the claim when read in light of the specification." 35 U.S.C. § 112, ¶ 2.

(66)   I have examined the '350 patent claims and specification. It is my opinion that claims 17, 26, 28, and 29 are indefinite.

1.   The "less restrictive" Recitations of Claims 17 and 26 Render the Claims Indefinite

(67)   Independent method claim 17 recites, among other things, "eliminating any of the pricing information that is less restrictive." Claim 26 also includes this recitation by virtue of its dependence from claim 17.

(68)   Plain meaning would suggest that the phrase "less restrictive" refers to the order in which information resides in "the hierarchy" because this understanding -- in limited circumstances -- may allow a person of ordinary skill to

determine "less restrictive" pricing information. This understanding is also consistent with the findings of the District Court, which considered the plain meaning of "the pricing information that is less restrictive" to mean "[p]ricing information that is less specifically applicable to a product, a purchasing organization, an organizational group or a product group." Memorandum Opinion and Order at 17-18, *Versata Software, Inc. v. SAP America, Inc.*, No. 2:07-cv-153 (E.D. Tex. May 19, 2009) (Exh. 1012).[1]

(69)   For example, in a single hierarchy where an entity exists at only one location in the hierarchy, one of skill in the art might understand the bounds imposed by "less restrictive" because, in this particular situation, pricing information found higher in the hierarchy may be considered "less restrictive" than pricing information associated with a lower level in the hierarchy without significant ambiguity.

(70)   The '350 Patent, however, also envisions (and the claims would include) situations where an entity exists at more than one location in a hierarchy. For example, "Adam" appears as a node in two places in the customer hierarchy of Fig. 4A—once beneath "Germany," and once beneath "Reseller."

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[1] The District Court, however, did not consider whether the plain meaning could "provide fair notice of the subject matter that is encompassed and the subject matter that is not encompassed by the claimed invention."

FIG. 4A
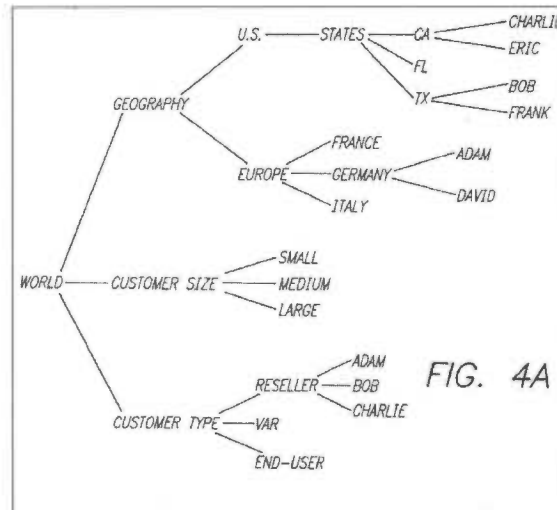
(71)   In situations such as this, the order in which applicable pricing information resides in the hierarchy does not reveal what pricing information is "less restrictive." For example, consider the assignment of a 10% discount for all purchases by German customers and a 5% discount for all purchases by Resellers. Both of these adjustments would apply to Adam because Adam is both a German customer and a Reseller. But one of ordinary skill cannot determine which of these discounts is "less restrictive" based on hierarchy position because (i) both discounts are applicable to a group of customers of which Adam is a member, and (ii) both groups are one level above Adam in the organizational group hierarchy.

(72)   Despite this deficiency, the only substantive discussion of "less restrictive" in the specification of the '350 Patent is found in column 19:23-53, describing certain steps of the flow diagram depicted in Fig. 15B.

FIG. 15B
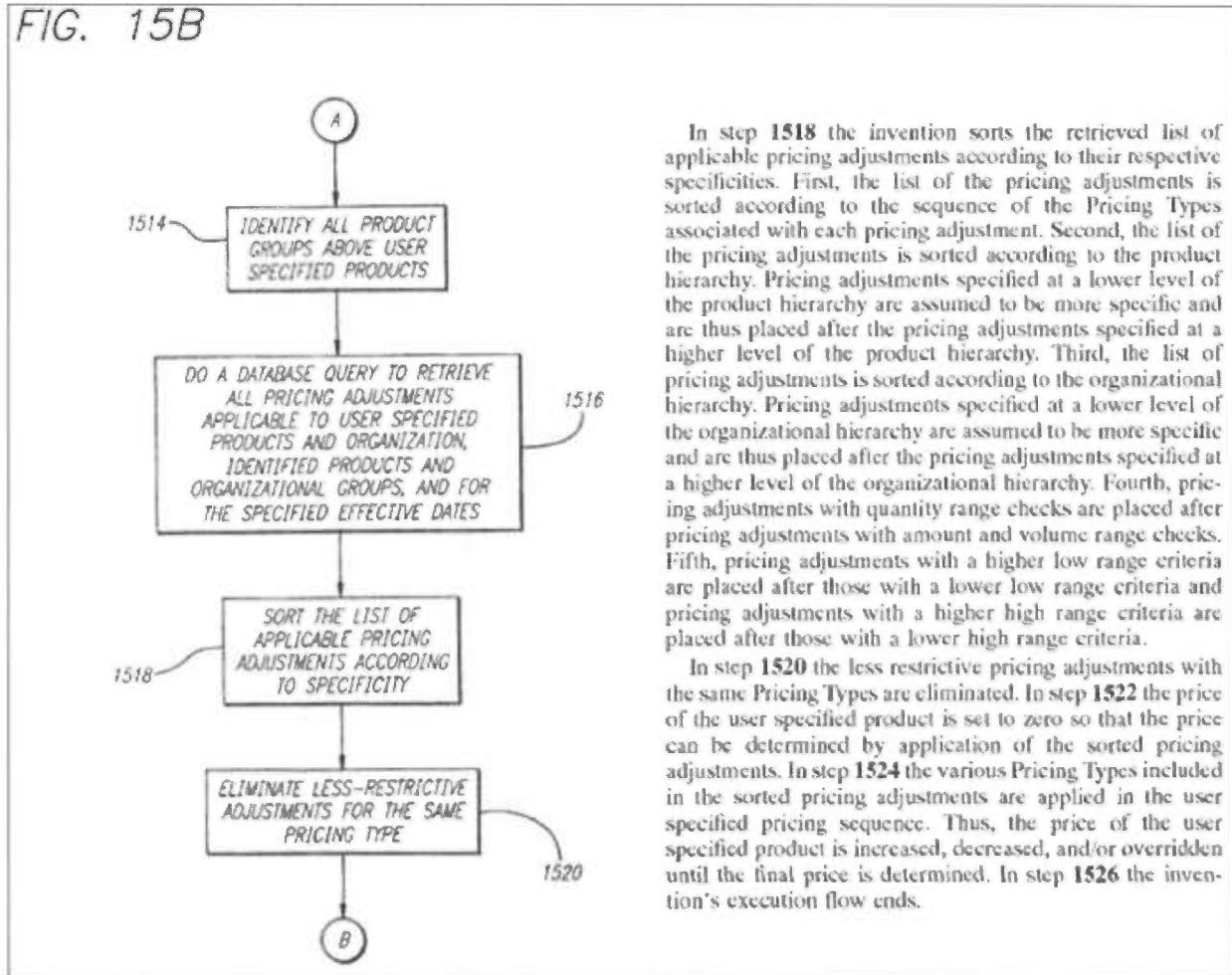
In step **1518** the invention sorts the retrieved list of applicable pricing adjustments according to their respective specificities. First, the list of the pricing adjustments is sorted according to the sequence of the Pricing Types associated with each pricing adjustment. Second, the list of the pricing adjustments is sorted according to the product hierarchy. Pricing adjustments specified at a lower level of the product hierarchy are assumed to be more specific and are thus placed after the pricing adjustments specified at a higher level of the product hierarchy. Third, the list of pricing adjustments is sorted according to the organizational hierarchy. Pricing adjustments specified at a lower level of the organizational hierarchy are assumed to be more specific and are thus placed after the pricing adjustments specified at a higher level of the organizational hierarchy. Fourth, pricing adjustments with quantity range checks are placed after pricing adjustments with amount and volume range checks. Fifth, pricing adjustments with a higher low range criteria are placed after those with a lower low range criteria and pricing adjustments with a higher high range criteria are placed after those with a lower high range criteria.

In step **1520** the less restrictive pricing adjustments with the same Pricing Types are eliminated. In step **1522** the price of the user specified product is set to zero so that the price can be determined by application of the sorted pricing adjustments. In step **1524** the various Pricing Types included in the sorted pricing adjustments are applied in the user specified pricing sequence. Thus, the price of the user specified product is increased, decreased, and/or overridden until the final price is determined. In step **1526** the invention's execution flow ends.

Thus, the specification provides very little discussion of what may be considered "less restrictive," and absolutely no guidance about how to solve the problem described above with respect to Adam.

(73)   Further complicating an analysis on the meaning of "less restrictive," the specification also references factors that affect the specificity of pricing information other than the pricing information's position on the hierarchy. Exh. 1001, Col. 19:36-53.

(74)   For example, at column 19:23-53, the '350 Patent discusses five sorting mechanisms for pricing adjustments "according to their respective specificities." While mechanisms (1)-(3) may be associated with the position of the information in a hierarchy, mechanisms (4) and (5) relate to "range checks" having no relation to the information's position in a hierarchy.

(75)   These factors, however, fail to provide further guidance regarding how to solve the problem described above with respect to Adam. Instead, the introduction of factors other than hierarchical position of the pricing information affecting the restrictiveness serves only to further confuse the meets and bounds of the claimed invention.

(76)   Thus, under the broadest reasonable interpretation of the claims, the Specification does not inform a person of ordinary skill in the art of the meaning of "less restrictive" for all subject matter encompassed by the claimed invention. The term "less restrictive" is also not a term of art. As a result, one of ordinary skill in the art cannot "understand the bounds of the claim when read in light of the specification," as required by 35 U.S.C. § 112, ¶ 2.

(77)   In view of the foregoing, claims 17 and 26 are indefinite because they fail to "reasonably apprise those skilled in the art of its scope" using "language that adequately notifies the public" of the scope of patentee's right. As such, these claims are invalid because they do not particularly point out and distinctly claim

the subject matter which the applicant regards as his invention in violation of 35 U.S.C. § 112, ¶ 2.

2. The "pricing information" Recitation of Claims 17 and 26 Renders the Claims Indefinite

(78)   I have been advised that when a claim uses an article such as "the" or "said," what follows the article should be an element that the claim previously recited. The previous recitation is called the "antecedent basis" for the later claim recitation. To avoid ambiguity, there should only be one antecedent basis for a claim element. The presence of multiple antecedent bases hinders the ability to understand what the claim is covering.

(79)   Claim 17 recites, in relevant part:

storing **pricing information in a data source**, wherein the
pricing information is associated, with (i) a pricing type,
(ii) the organizational groups, and (iii) the product
groups;
retrieving applicable **pricing information corresponding to
the product**, the purchasing organization, each product
group above the product group in each branch of the
hierarchy of product groups in which the product is a
member, and each organizational group above the
purchasing organization in each branch of the hierarchy
of organizational groups in which the purchasing
organization is a member;

sorting **the pricing information** according to the pricing types,

> the product, the purchasing organization, the hierarchy of
> product groups, and the hierarchy of organizational
> groups;

eliminating any of **the pricing information** that is less

> restrictive; and determining the product price using the
> sorted pricing information.

(Emphasis added.)

Claim 26 also includes these recitations by virtue of its dependence from claim 17.

(80)   Claim 17 therefore defines two types of pricing information: "pricing information in a data source" and "pricing information corresponding to the product." The claim's "sorting" and "eliminating" elements, however, recite "the pricing information" without distinguishing between the two types of "pricing information."

(81)   Therefore, the phrases "sorting the pricing information…" and "eliminating any of the pricing information that is less restrictive…" are indefinite because it is unclear which "pricing information" serves as the antecedent basis for the "the pricing information" recitation of those phrases. As a result, claims 17 and 26 are indefinite and invalid under 35 U.S.C. § 112, ¶ 2.

3.   Claims 26 and 28 are Indefinite for Improperly Mixing Two Statutory Classes

(82)   I have been advised that a patentee cannot simultaneously claim an apparatus and recite steps for using that apparatus without running afoul of 35

U.S.C. § 112, ¶ 2. One reason this violates 35 U.S.C. § 112, ¶ 2 is because it is not

clear whether infringement of the claim occurs when one creates the apparatus or

when the user actually performs the steps.

(83)   Claim 26 recites "[a] computer readable storage media comprising:

computer instructions to implement the method of claim 17." Claim 17, in turn,

recites a series of steps, including:

> arranging a hierarchy of organizational groups comprising a plurality of branches such that an organization group below a higher organizational group in each of the branches is a subset of the higher organizational group; [and]
>
> arranging a hierarchy of product groups comprising a plurality of branches such that a product group below a higher product group in each of the branches in a subset of the higher product group.

(84)   The patent specification, however, only describes users of the claimed

invention creating the hierarchies employed by the claimed invention. For

example, Col. 6:17-39 describes the arrangement of the hierarchy of purchasing

organizations and organizational groups as "determined by the user of the

invention's pricing system." Similarly, Col. 7:50-Col. 8:2 describes the

arrangement of the hierarchy of products and product groups as "determined by the

user of the invention's pricing system." Col. 13:19-51 describes the user's creation

of the hierarchies of organizational groups and product groups, noting that "[a]s

stated above, each of the organizational groups are determined solely by the user"

and "[t]he explanations given above with respect to the user selection of how to group the various product groups." (Emphasis added).

(85) Versata has also acknowledged that users are the ones who arrange the hierarchies employed by the claimed invention.

(86) By virtue of its dependence from claim 17, the "computer readable storage medium" of claim 26 therefore recites at least two user-performed steps.

(87) Claim 26 therefore does not reveal whether infringement occurs (i) upon creation of the claimed "computer readable storage media" or (ii) when the user performs the recited "arranging" steps using the claimed "computer readable storage medium."

(88) Because it is not clear when infringement of claim 26 occurs, the claim does not particularly point out and distinctly claim the subject matter which the applicant regards as his invention in violation of 35 U.S.C. § 112, ¶ 2.

(89) Claim 28 recites "[a] computer readable storage media comprising: computer instructions to implement the method of claim 27." Claim 27, in turn, recites a series of steps, including:

> receiving the price of the product determined using pricing information applicable to the one or more identified organizational groups and the one or more identified groups according to the hierarchy of product groups and the hierarchy of organizational groups.

(90) No machine embodiment of the claimed invention, however, receives the determined product price. Instead, the invention determines the product price

and only a user receives it. The Specification at Col. 3:9-13, for example, describes the claimed invention as "a method and apparatus for determining prices for various products...." (Emphasis added.) Similarly, Col. 16:1-3 notes that "[t]he invention provides a further feature in determining the final price of a product by providing a "Target" operation...." (Emphasis added.). Finally, Figure 15C, element 1524, describes an embodiment "determin[ing] the price of the user specified product by applying each pricing adjustment in the sorted order." The Specification nowhere, however, discloses or suggests that the claimed invention may receive such information.

(91)   By virtue of its dependence from claim 27, the "computer readable storage medium" of claim 28 recites at least one user-performed step.

(92)   As such, claim 28 does not reveal whether infringement occurs (i) upon creation of the claimed "computer readable storage media" or (ii) when the user receives the price of the product determined by the claimed invention.

(93)   Because it is not clear when infringement of claim 28 occurs, the claim does not particularly point out and distinctly claim the subject matter which the applicant regards as his invention in violation of 35 U.S.C. § 112, second paragraph.

IX. SAP's Pricing System History

(94) For four decades, SAP has been and continues to be recognized as an innovation leader in enterprise software systems. The company was founded in 1972 by five former IBM employees who had a vision of creating standard application software for the real-time processing of business information. *See* SAP History, 1972-1981: the early years, *available at* http://www.sap.com/corporate-en/our-company/history/1972-1981.epx (Exh. 1013). In 1973, SAP completed its first financial accounting system, RF, which then served as the foundation for the development of other software modules of the system that would ultimately be called R/1. *Id.*

(95) In 1979, SAP began to replace R/1 with R/2, a mainframe-based business application software suite. *Id.* R/2 integrated all of the common functions of a business such as accounting, pricing, materials, and human resources but the fact that it required a mainframe computer limited its appeal mainly to large companies. Over the course of the 1980s, SAP expanded its customer base and formed subsidiaries to market its products all over the world. *See* SAP History, 1982-1991: the SAP R/2 era, *available at* http://www.sap.com/corporate-en/our-company/history/1982-1991.epx (Exh. 1014). During this period, SAP continued to develop R/2 but also began working on its next-generation enterprise software system, R/3. *Id.*

(96)   In 1992, SAP launched R/3 and moved toward a multi-platform

architecture for its enterprise software. *See* SAP History, 1992-2001: the SAP R/3

era, *available at* http://www.sap.com/corporate-en/our-company/history/1992-

2001.epx (Exh. 1015). SAP released R/3 in several versions, one in particular is

R/3 2.2, which, I have been advised, shipped in various sub-versions in 1995. R/3

appealed more to midsize companies than the mainframe-based R/2, and allowed

SAP to further expand its customer base. *See id.* In the 1990s, SAP conducted

SAPPHIRE conferences in several locations around the world to provide

information and training to customers relating to R/3. *Id.* SAP's leadership in the

development of enterprise software systems continues to this day. *See* SAP

History, 2002-present: real-time data where and when you need it, *available at*

http://www.sap.com/corporate-en/our-company/history/2002-present.epx (Exh.

1016).

X.   Claim Interpretation

(97)   In the present proceeding, I have been advised that the claims are to

be given their broadest reasonable interpretation in view of the specification

("BRI") and that this standard differs from the one used in district court patent

litigations. I therefore understand that I am not bound by the findings of the

district court. I note that my conclusions below may vary if I were to apply the

district court's claim construction standard. Below, I set forth what I believe to be

the broadest reasonable interpretation of certain claim terms in view of the specification, as well as the factual basis for those opinions. As to the other terms that I do not address, I will simply apply the broadest reasonable interpretation in view of the specification as understood by one of ordinary skill in the art. In arriving at the below opinions, I carefully considered the '350 patent, the '350 patent's file history, the '400 patent's file history, the different positions taken by the parties, the parties' agreed-to claim constructions, as well as the district court's claim construction. In the chart below, I provide a summary of the BRI for certain terms that are relevant to the contested claims. Following the chart, I provide my reasoning and the factual basis in support of my proposed interpretation for each term.

Claim Term	Broadest Reasonable Interpretation in View of the Specification
"sorting the pricing information"	The term means that the pricing information is ordered.
"the pricing information that is less restrictive"	This term is insolubly ambiguous and indefinite. For purposes of my prior art analysis, I will use the district court's claim construction: "pricing information that is less specifically applicable to a product, a purchasing organization, an organizational group or a product group."
"pricing type(s)"	The term "pricing type" means "a class or category of pricing adjustments," where pricing adjustments means "a denormalized number that may affect the determined price."
"pricing information"	The term "pricing information" means: "any information relating to price other

	than an adjustment to price that is not a denormalized number."

(98)   **sorting the pricing information:** In my opinion, the BRI of "sorting the pricing information" is that the pricing information is ordered. This is the plain meaning. I understand that the district court adopted the same interpretation that I have. Further, I note that claim 1 of the '350 patent specifically requires "sorting the *retrieved* pricing information" (emphasis added), while claim 17 (and thus claim 26) only require "sorting the pricing information." In my view, this is a deliberate and important distinction. The language of claim 1 requires that pricing information first be retrieved, and then sorted. The language of claim 17, on the other hand, requires only that the information be sorted (i.e., ordered)—it does not imply or require a temporal limitation forcing the sorting to occur after the retrieving. In other words, the sorting step could occur before the retrieving step. I have carefully examined the claim, and in particular the retrieving and sorting steps, and I see no basis for requiring one to happen before the other. Thus, the BRI of "sorting the pricing information" in the context of the '350 patent is simply that the pricing information is ordered and this may happen either before or after the retrieving step.

(99)   **the pricing information that is less restrictive:** As I discuss elsewhere, in my opinion, the term "the pricing information that is less restrictive"

is insolubly ambiguous and indefinite. For purposes of my prior art analysis, I will use the district court's claim construction: "pricing information that is less specifically applicable to a product, a purchasing organization, an organizational group or a product group."

(100) **pricing type(s):** The BRI of "pricing type(s)" is "a class or category of pricing adjustments." *See* '350 patent Col. 19:44-45 ("the less restrictive pricing adjustments with the same Pricing Types are eliminated."). I understand that, in the district court litigation, the parties agreed that the term meant "a class or category of pricing adjustments" and I agree. Further, the district court interpreted the term "pricing adjustments" to mean "a denormalized number that may affect the determined price." I agree that this is the definition under the BRI standard as well because it appears to me that the patent owner limited its invention to denormalized numbers. See Exh. 1001, Col. 3:65-Col. 4:4 ("The combination of organizational groups and product groups hierarchies and the denormalized pricing table . . . result in some of the advantages of the present invention over the prior art pricing systems."); *see also id.* at Abstract; *id.* at Figs. 1, 2, and 5; *id.* at Col. 4:28-32; *id.* at Col. 8:37 - Col. 9:4; *id.* at Col. 10:45-66; *id.* at Col. 11:7-66.

(101) Further, a "pricing adjustment" includes both performing a calculation on a preexisting number (*e.g.*, increasing or decreasing) and overriding a preexisting number. *See* Exh. 1001, Col. 19:48-52 ("the various Pricing Types

included in the sorted pricing adjustments are applied in the user specified pricing sequence. Thus, the price of the user specified product is increased, decreased, and/or overridden until the final price is determined."). Moreover, a "pricing type" is clearly a "class or category of pricing adjustments." *See, e.g.*, Exh. 1001, Col. 19:44-45 ("the less restrictive pricing adjustments with the same Pricing Types are eliminated."). Accordingly, based on the specification, the BRI of "pricing type(s)" is "a class or category of pricing adjustments," and "pricing adjustments" means "a denormalized number that may affect the determined price." I have been advised that the patent owner's trial interpretation of this term is very broad, and it is this definition that I will use in my analysis. The district court's claim construction, which was agreed to by the parties, follows:

| 14. | "denormalized pricing adjustment" | '350 claims 7, 24 | These terms mean a number, used as a price adjustment, that does not have fixed units and may assume a different meaning and different units depending on the pricing operation that is being performed; the specific units to be associated with the number, and how the number will be applied, are determined during "run time" – the time that the system uses the pricing adjustment data to determine the price of the product offered to the purchasing organization. |
| | "denormalized number" | | |

(102) Joint Claim Construction and Prehearing Statement at Joint Appendix A, p. 2., *Versata Software, Inc. v. SAP America, Inc.*, No. 2:07-cv-153 (E.D. Tex. Nov. 21, 2008) (Exh. 1019). I have been advised that Versata's interpretation is that "'Determined at runtime' means that, at runtime, the computer determines the units connected with the number, and the number's application, by retrieving and

interpreting the information previously associated with that number by the pricing administrator." Using this interpretation, a user associates the units with the number and specifies how the number is to be applied (e.g., discount) at data entry time and then, at runtime, the system simply uses that information. It seems to me that the broadest reasonable interpretation should at least include this, the patent owner's, interpretation. So that is the definition I will use.

(103) **pricing information:** I understand that the district court interpreted this term to mean "any information relating to price other than an adjustment to price that is not a denormalized number." I agree that this should be the same interpretation under the BRI standard because, as I mentioned above, the patent owner limited its invention to denormalized numbers.

XI. Unpatentability Based on Prior Art in the Present Proceedings

(104) I have been advised that in the present proceedings a patent will be found to be unpatentable over prior art based on two provisions in the statute:

> (i) prior art that is described by section 102(a) of [title 35] (as in effect on the day before March 16, 2013); or
> (ii) prior art that—
>> (I) discloses the invention more than 1 year before the date of the application for patent in the United States; and
>> (II) would be described by section 102(a) of such title (as in effect on the day before the effective date set forth in section 3(n)(1)) if the

disclosure had been made by another before the
invention thereof by the applicant for patent.

See subsection 18(a)(1)(C) of the Leahy-Smith America Invents Act (AIA). I am
advised that the '350 patent is a continuation of the '400 patent, which was filed on
June 17, 1996. I am further advised that this means that the '350 patent is
considered to have been filed on June 17, 1996 for purposes of determining
whether a reference constitutes prior art. Thus, under subsection 18(a)(1)(C)(ii) of
the AIA, a reference will qualify as prior art if it disclosed the invention on June 16,
1995 or earlier.

(105) The relevant version of 35 U.S.C. § 102(a) reads as follows: "A
person shall be entitled to a patent unless - (a) the invention was known or used by
others in this country, or patented or described in a printed publication in this or a
foreign country, before the invention thereof by the applicant for patent."

(106) I have been advised that, in order to qualify as a prior art printed
publication, a reference must have been sufficiently accessible to the public
interested in the art. In general, a reference is considered publicly accessible if it
was disseminated or otherwise made available to the extent that persons interested
and ordinarily skilled in the subject matter or art exercising reasonable diligence,
could locate it.

(107) I have been advised that, in order for a prior art printed publication to
anticipate a claim, the publication must disclose every element of the claim and

must enable a person of ordinary skill in the relevant field to practice the claimed invention without undue experimentation. In determining whether the printed publication is enabling, one should take into account what would have been within the knowledge of a person of ordinary skill in the art in the relevant timeframe.

(108) I have been advised that, in order for a claim to be anticipated because its subject matter was <u>known</u> by others in the United States, the knowledge must have been publicly accessible. Moreover, the disclosure must have been of sufficient detail to enable one with ordinary skill in the art to practice the invention. In determining whether the disclosure is enabling, one should take into account what would have been within the knowledge of a person of ordinary skill in the art in the relevant timeframe.

XII. SAP's R/3 Online Documentation

(109) I have been asked to consider and provide opinions on the R/3 2.2 Online Documentation CD by SAP AG (1994) ("R3 documentation") in view of the '350 patent. I reviewed the online documentation CDs that came with R/3 version 2.2C. I have been advised that this version of R/3 shipped as early as January 1995, and before June 17, 1995, it was sent to many customers. *See* Declaration of Karen Fischer ("Fischer Decl.") (Exh. 1009), ¶¶ 7-28.; *id.* at Attachments A-1 – A-17. Also, this version was advertised so that anyone could purchase it. *See* Declaration of Jodi L. Gregory ("Gregory Decl.") (Exh. 1008), and

evidence contained therein. The documentation that accompanied this product came in two versions: documentation CD 2.2A and 2.2B (Exh. 1017). I have examined both disks and some files are identical and others are substantially the same. The differences do not affect my analysis in any way. I will collectively refer to both disks below as the R3 documentation. In my claim chart, I provide screen shots from the 2.2B CD and provide cites to a print out of both CDs. In this manner, it will be easy to determine where the teachings are located. I have been advised that these two CDs accompanied the sales of R/3 2.2C before June 16, 1995.

(110) I understand that I reviewed the R3 documentation in the same form as it was available to and provided to SAP's customers back in 1995. In particular, I personally installed and reviewed the R3 documentation CDs on a computer using an exact copy of the archived original CD, which I was given. I have been advised that the archived original CDs are exactly what was provided to customers in 1995. Upon installation, I found that the disk labeled "Release 2.2" contained R3 documentation version 2.2A. I found that the disk labeled "Release 2.2 Version 3" contained R3 documentation version 2.2B. I then directed that screenshots from the R3 documentation CD 2.2B be incorporated into my claim chart (attached as Appendix C), although as I mentioned above, I provide cites to a print out of both CDs.

(111) In addition, I was already generally familiar with R/3 in the mid 1990s because MIT installed R/3 in that timeframe. To the best of my knowledge, SAP never had any restrictions on who was allowed to purchase R/3 (including R/3 2.2). In other words, if a company or individual had the money and wanted R/3, to the best of my knowledge, they could purchase it and obtain the system and accompanying documentation.

(112) The R3 documentation describes an enterprise information system designed to manage and account for all of the resources, information, and activities of a business. The enterprise information system is described as a number of functional modules covering the typical functions in a business. These modules include Financials and Controlling, Human Resources, Materials Management, Production Planning, and Sales and Distribution, among others.

A. The R3 Documentation's Automatic Pricing Functionality

(113) The Sales and Distribution (SD) module handles the tasks of order processing, order fulfillment, and billing. One of the tasks of the SD module is to determine the price at which a sales company will offer a product for sale to a customer and to create sales documents including orders and invoices. The price that a sales company offers to a customer for a particular product may depend on a number of factors, including the nature of the relationship between the sales company and the customer, the size of the order, time-limited special offers,

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packaging and freight charges, and taxes. To provide the necessary flexibility, the R3 documentation describes a flexible and configurable technology, known as "the condition technique," which can be customized by the user to support any factors and considerations that the sales company chooses to use to determine a price.

(114) The SD module organizes both customer organizations and products into hierarchies so that users can treat groups of customers or groups of products in a uniform manner with respect to pricing (and other information management activities). Customers can be grouped by creating customer price groups and by creating customer hierarchies as shown in the following excerpt from the R3 documentation:

Building a Customer Hierarchy

Organizational data

Number that uniquely identifies node

Smith
Central
4711
0001 | 01 | 01
Pricing x

Smith
South
4712
0001 | 01 | 01
Pricing ⌐

Smith
North
4713
0001 | 01 | 01
Pricing x

Customer
2742

Smith
Northwest
4714
0001 | 01 | 01
Pricing ⌐

Smith
Northeast
4715
0001 | 01 | 01
Pricing ⌐

Customer
2743

Customer
2744
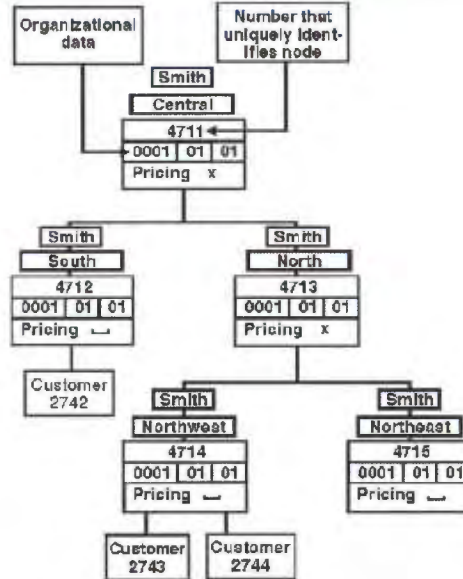
SAP-00029617; SAP-00013919.[2]

Similarly, products can be organized into groups by assigning them to "material pricing groups" and by creating product hierarchies as shown in the following excerpt from the R3 documentation:

---

[2] I will use this convention throughout my declaration and my claim chart. The first bates number is to the version 2.2 B CD, which is where the corresponding screen shot came from. The second bates number is to the corresponding teaching in the version 2.2 A CD.

SD Guide to Basic Functions and Master Data

File Edit Bookmark Options Help

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Grouping Materials

Materials can be grouped according to different criteria. This allows for easier management and better evaluation of materials with similar features. The standard version of the SAP R/3 System does not provide exact criteria to differentiate between individual groupings. These criteria can be defined by the company to meet their specific demands. The groupings are determined and defined by the system administrator. Contact him, if you have questions concerning the existing groupings. In the standard version of the SAP R/3 System the following groupings are possible, for example:

- Material group
- Material pricing group
- Product hierarchy

Material Group

Goods with the same features (for example, nails) can be grouped using the field *Material group*. Unlike the product hierarchy, the material group does not contain different levels or possible combinations of goods. You can, however, use the material group to carry out different analysis functions. The material group is defined by a nine-digit, alphanumeric key. It is not primarily of importance for sales and distribution, but is used mainly in materials management.

Material Pricing Group

The material pricing group can also be used to group materials, especially for pricing and for analyses. The material pricing group is defined by a two-digit, numeric key.

Product Hierarchy

The product hierarchy is used to group materials by combining different features. It is used for analyses and pricing. A product hierarchy can consist of up to eighteen characters. Its features can be combined in various ways. The following figure gives an example of how materials can be grouped using product hierarchies.

In this case, a dishwasher can be described by product hierarchy 000100002000000002. This series of characters states that dishwashers belong to the category electrical *appliances* (series of characters 00001, position 1-5), and also to *wet appliances* (series of characters 00002, position 6-10) and, finally, to *dishwashers* (series of characters 00000002, position 11-18).

SAP-00029548-9; SAP-00013845-6.

(115) The SD module uses a mechanism called the condition technique to determine the price at which a product will be offered for purchase to a customer. The condition technique provides a very flexible and robust mechanism for storing pricing information and for using it to calculate a price at which a product will be offered. The condition technique includes the following components:

1. Condition Types: The user can specify a number of condition types, one for each kind of price, discount, or surcharge that applies to a sales company's pricing calculations.

2.   Condition Tables: Condition tables store individual condition records (pricing information) and are keyed by a combination of values that may include either or both of the customer and the material (product). The term "material" is the term used in the R3 documentation for both a product and a service.

3.   Condition Records: In the R3 documentation, pricing information is called condition records. Condition records specify either a price (e.g., retail price) or a calculation to a price (e.g., 10% discount). Condition records are also referred to in the R3 documentation as pricing elements.

4.   Pricing Procedures: Pricing procedures (or just "procedures") determine the order in which the system processes condition types.

5.   Access Sequences: There is one access sequence for each condition type. The access sequence specifies the order in which condition tables are used to search for and retrieve condition records corresponding to an individual condition type.

(116) The relationship between these components is shown by the following figure from the documentation:

Condition Technique: Overview

How the Elements of the Condition Technique Work Together

The following figure illustrates the relationships between elements of the condition technique.

Access sequences

CCCC

BBBB

AAAA

Access no.	Cond. table
10	001
20	003
30	002

Searching for valid condition records

Condition tables

001	Key
002	Key
003	Key

Condition records

001

002

003

Storing and retrieving condition data.

Controlling the search for valid condition records

Condition types

CCCC

BBBB

AAAA

Definition of:
- Control data
- Changes allowed
- Procedure maintenance

Controlling the conditions in the document

Procedures

US-STANDARD

Condition type	Manual	Acct key
AAAA	X	ERL
BBBB		ERL
CCCC	X	ERS

SAP-00029638; SAP-00013939.

(117) When configuring a condition technique, the user first specifies that a particular pricing procedure is to be used to compute a price. The pricing procedure indicates the high-level components that are to be taken into consideration when determining a price, and this is accomplished through the

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condition types. The procedure identified in the figure is labeled "US-Standard" and refers to standard pricing for a customer in the United States. The procedure identifies a sequence of condition types. In the figure, these are identified as AAAA, BBBB, and CCCC, but in other examples from the documentation, these might be gross price, various discounts (such as quantity discounts or preferred customer discounts), freight costs, and taxes. Different procedures would be defined, for example, for customers in different countries that are subject to different taxes.

(118) Each condition type identifies an access sequence that specifies the order in which the system should search condition tables to find pricing information (called condition records in the R3 documentation). An example of pricing information (condition record) would be to add a 5% sales tax. There may be pricing information that depends on the specific product, on the specific customer, on some more general classification of products, on some more general classification of customers, or on a combination of product hierarchy and customer hierarchy.

(119) The access sequences operate in two modes, controlled by an "exclusive access indicator" in each access sequence. When the exclusive access indicator is not set, each condition record identified by the access sequence is retrieved (from its condition table) in the order specified by the user, and the last

one retrieved is used in the calculation of the price. In this case, the condition records are ordered from most general to most specific, and it is the most specific one that is utilized to calculate a price. When the exclusive access indicator is set (in "exclusive" mode), the first record identified by the access sequence is retrieved from its condition table and then used in the calculation of the price. In this case, the condition records are ordered from most specific to most general.

(120) The next component of the condition technique is the condition table. Each access sequence contains a list of condition tables. Each condition table defines the "key" that is used to search for a condition record. One table will hold condition records that depend on the product being offered for sale. Another table will hold condition records that depend on the customer to which the product is being offered. Yet other condition tables will hold condition records that depend on both the customer and the product, or customer groups, or product groups, or any other desired combination of information needed to identify the desired condition records.

(121) Finally, condition tables contain condition records, and each condition record stores an individual item of pricing information. A condition record may store a price (for example, a gross price), a discount (for example, a customer discount or quantity discount), or a surcharge (for example, a freight charge or a tax). A sequence of condition records, one for each of the condition types in a

pricing procedure, are used to compute a price at which a product will be offered for sale.

B. The R3 Documentation's Condition Technique in Operation:

(122) To make use of the automatic pricing functionality, for example, a sales company first defines hierarchies of its customers and its products. It can organize its customers geographically (e.g., country-state-city) or using any other criteria that makes sense for that sales company's business. Then, the sales company creates a product hierarchy to reflect its product offerings. Next, the sales company uses the condition technique, including the pricing procedure, condition types, access sequences, condition tables and condition records previously described.

(123) At runtime, a sales representative will request a price for a particular sales order (e.g., a particular customer will order a particular product in a certain quantity). In the case of the immediately preceding example, the condition technique will then operate as follows:

1. The condition technique will cause each condition type in the pricing procedure to be processed (AAAA, BBBB, and CCCC), and each condition type will return pricing information that will influence the price offered to the customer. For example, the pricing information returned for the condition types in a pricing

procedure may include a base price of $10, a discount of 10% and a sales tax of 5%, in which case the final sales price will be $9.45.

2.   Each condition type's access sequence (in the example, AAAA, BBBB, and CCCC) has a list of condition tables to search through to find the appropriate pricing information (condition records). For example, one condition type may be responsible for determining the base price. The access sequence searches each table in turn to determine if that table has a condition record that satisfies the criteria of the sales order. In the example, access sequence AAAA accesses condition tables 001, 003, and 002 in that order.

3.   When each condition table is accessed, a key is formed based on criteria from the sales order (e.g., the customer and the requested product, or the customer and the product group that contains the requested product, or the customer group and the requested product, and so forth). The table is then indexed using this key to determine if a condition record exists that matches the sales order's criteria.

4.   Each access sequence returns, via the condition tables, one condition record for use in determining a final price. In the case where the exclusive access indicator is not set, however, the access sequence retrieves all matching condition records, orders the condition records from most general to most specific, and returns the most specific one for use in generating a price. In the case where the

exclusive access indicator is set, the access sequence retrieves the first matching condition record and uses this one in generating a price.

5.   The pricing information from each access sequence/condition type is then utilized in the order specified by the pricing procedure to determine the final price.

C.   The R3 Documentation and U.S. Patent No. 6,553,350 claims 26 and 17

(124) I first discuss below claim 26 and the claim from which it depends, claim 17, because these claims are the narrowest of the contested claims. Claim 17 of U.S. Patent No. 6,553,350 follows:

> 17.   A method for determining a price of a product offered to a purchasing organization comprising:
>
> arranging a hierarchy of organizational groups comprising a plurality of branches such that an organizational group below a higher organizational group in each of the branches is a subset of the higher organizational group;
>
> arranging a hierarchy of product groups comprising a plurality of branches such that a product group below a higher product group in each of the branches in a subset of the higher product group;
>
> storing pricing information in a data source, wherein the pricing information is associated, with (i) a pricing type, (ii) the organizational groups, and (iii) the product groups;
>
> retrieving applicable pricing information corresponding to the product, the purchasing organization, each product group above the product group in each branch of the hierarchy of product groups in which the product is a member, and each organizational group above the

purchasing organization in each branch of the hierarchy of organizational groups in which the purchasing organization is a member;

sorting the pricing information according to the pricing types, the product, the purchasing organization, the hierarchy of product groups, and the hierarchy of organizational groups;

eliminating any of the pricing information that is less restrictive; and determining the product price using the sorted pricing information.

Claim 26 follows:

26. A computer readable storage media comprising: computer instructions to implement the method of claim 17.

(125) The R3 documentation anticipates claims 26 and 17 because it discloses every element of the claims.

1. Claim 26: Computer readable storage media:

(126) As an initial matter, the R3 documentation discloses a computer-based pricing system that is part of an overall enterprise information system. As a result, the R3 documentation inherently discloses a software system (computer instructions) operating within the memory of a computer system, which thus satisfies claim 26 because, in my opinion, the memory of a computer system is a computer readable storage media. I note that, between invocations, this system would reside on secondary storage, such as a hard disk, which would also

constitute a computer readable storage media. See SAP00014846-57;

SAP00000578-89.

2. Claim 17: A method for determining the price of a product offered to a purchasing organization comprising:

(127) As I described previously, the R3 documentation describes an

enterprise information system that includes a Sales and Distribution module that

determines the price of a product. *See* SAP-00014846-57, SAP-00029633, SAP-

00029640-2, SAP-00029697-8; SAP-00000578-89, SAP-00013934, SAP-

00013941-3, SAP-00014001-2.

a. Arranging a hierarchy of organizational groups comprising a plurality of branches such that an organizational group below a higher organizational group in each of the branches is a subset of the higher organizational group;

(128) As I demonstrated above, the R3 documentation is replete with

hierarchies and discloses at least two methods that satisfy this claim element:

customer hierarchies and customer price groups.

Customer Hierarchies: In a customer hierarchy, each node in the hierarchy is a

subset of the organizations in its ancestor nodes. A user may use any criteria to

organize the hierarchy. In the example given previously, the criteria is

geographical location. A customer hierarchy may have any number of levels of

nodes, and can be rearranged as necessary to adapt to changing requirements.

Usually, customers are assigned to nodes at the lowest level of the hierarchy.

However, it is also possible to assign customers to nodes at higher levels in the hierarchy.

Customer Price Groups: A customer price group is used to apply pricing information (e.g., a discount) to a particular group of customers. Customers can be grouped by indicating the pricing group to which each customer belongs. The R3 documentation has extensive examples of separating customers into wholesale and retail groups and of determining the price of a product based on the group of which the customer is a member. The customer price group forms a hierarchy of two levels: the group and its members. *See* SAP-00029494, SAP-00029510-32, SAP-00029615-26, SAP-00029676-7, SAP-00029698; SAP-00013791, SAP-00013807-29, SAP-00013916-27, SAP-00013980-81, SAP-00014002.

> **b. Arranging a hierarchy of product groups comprising a plurality of branches such that a product group below a higher product group in each of the branches in a subset of the higher product group;**

(129) The R3 documentation discloses at least two methods that satisfy this claim element: product hierarchies and material pricing groups.

Product Hierarchies: Product hierarchies are disclosed in the R3 documentation, as I showed above. In forming a product hierarchy, the user may define the criteria used to differentiate between individual product groupings. For instance, in the previous example of a product hierarchy, the hierarchy of electrical appliances is divided into dry and wet appliances and further divided into specific appliance

types. More than one product hierarchy may be defined. For example, the previous example includes one hierarchy that contains electrical appliances and a second hierarchy that contains spare parts.

Material Pricing Groups: The material pricing group supports a simple two-level hierarchy. Each material (the R3 documentation's name for products and services) may be assigned to a material pricing group, which is a two digit numeric key. A material pricing group then contains all of the materials that are assigned the same key. In this way, the material pricing group forms a two-level hierarchy: the material pricing group and its members, the materials that belong to that material pricing group. *See* SAP-00023312, SAP-00023355-6, SAP-00029537-58, SAP-00029642-50, SAP-00029677, SAP-00029698; SAP-00008872, SAP-00008915-6, SAP-00013834-55, SAP-00013943-53, SAP-00013981, SAP-00014002.

> ### c. Storing pricing information in a data source, wherein the pricing information is associated, with (i) a pricing type, (ii) the organizational groups, and (iii) the product groups;

(130) As I described previously, the R3 documentation describes the condition technique, and it is this mechanism that satisfies the "storing" claim element. The condition technique includes pricing procedures, condition types, access sequences, condition tables, and condition records. The condition technique allows the user to store pricing information that is associated with pricing types, organizational groups and product groups. As shown above (in the figure at ¶ 116),

the pricing information is associated with pricing types (which are condition types in the R3 documentation) using pricing procedures and access sequences. The pricing information is associated with organizational groups and product groups using access sequences and condition tables, as shown in the following examples.
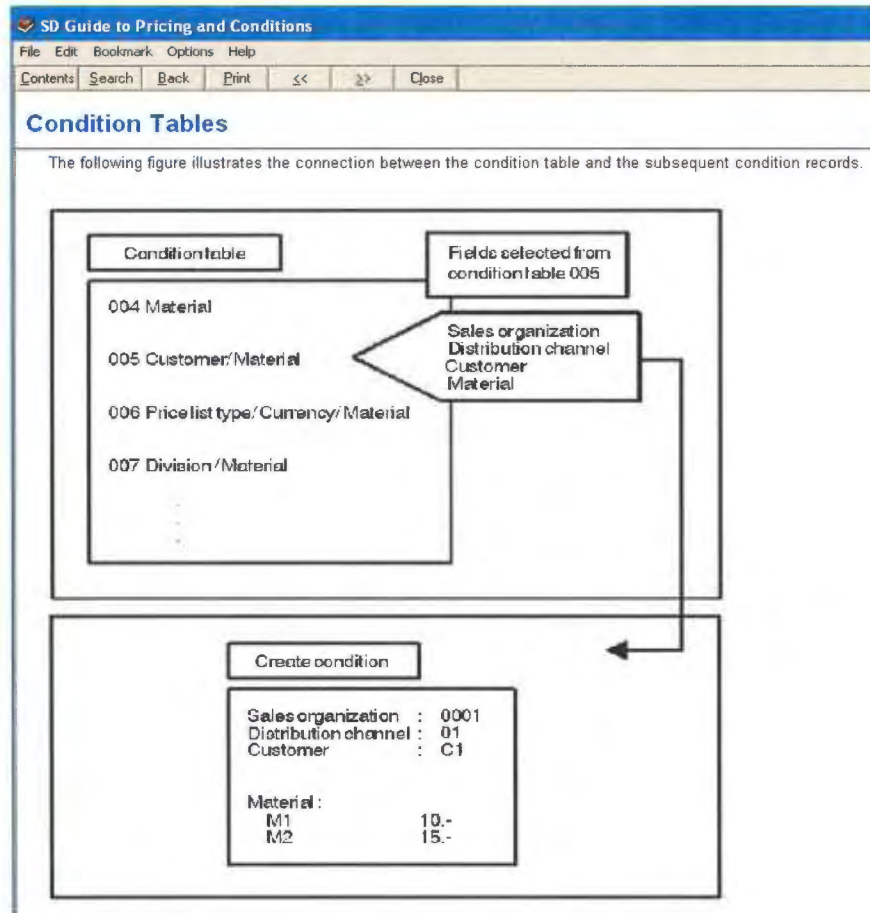
SAP-00029653-4; SAP-00013956-7.

(131) The above example from the R3 documentation shows a number of condition tables that demonstrate that pricing information is associated with organization groups. The standard condition tables in the R3 documentation associate prices with a sales organization and a distribution channel along with

information associated with the customer and the product, thus these two elements are always included in the key for every condition table. Table 005 stores condition records associated with a particular customer and a material. Table 004 stores condition records that are not associated with a particular customer; the key for this condition table is just the material. Table 007 stores condition records that are associated with a division (a grouping of customers or "organizational group") and a material. Table 006 stores condition records associated with Price list type, currency, and material.

(132) The following excerpt from the R3 documentation describes how pricing information (condition records or price agreements in R3) can be associated with any combination of material, material hierarchy ("product group"), customer, and customer hierarchy ("customer group").

SD Guide to Basic Functions and Master Data								
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Pricing Elements

- A price agreement can be limited to a period by specifying a validity period.

Standard Price Agreements

Price agreements commonly used are predefined in the standard version of the SAP R/3 System. These price agreements depend on the sales organization and the distribution channel. There are price agreements for a

- material
- customer
- combination of customer and material
- combination of customer and product hierarchy
- combination of customer group and material
- combination of customer group and product hierarchy

SAP-00029499-500; SAP-00013796-7.

See SAP-00014853, SAP-00029499-500, SAP-00029633-29700, SAP-00029706;

SAP-00000585, SAP-00013796-7, SAP-00013934-4004, SAP-00014011-2.

> **d. Retrieving applicable pricing information corresponding to the product, the purchasing organization, each product group above the product group in each branch of the hierarchy of product groups in which the product is a member, and each organizational group above the purchasing organization in each branch of the hierarchy of organizational groups in which the purchasing organization is a member;**

(133) The condition technique satisfies this claim element. As described above under the "storing" claim element (and specifically the excerpt above), the condition technique stores pricing information corresponding to customers, customer groups, products, product groups, or any combination thereof. Thus, this correspondence is maintained when this information is retrieved.

(134) The R3 documentation describes using a pricing procedure to indicate what condition types should be used to calculate a price for a sales order. The pricing procedure also indicates the order in which the system should apply the condition types. Associated with each condition type is an access sequence which specifies the order in which condition tables should be searched to find an applicable condition record. For each condition type, the pricing procedure retrieves pricing information (a condition record). The pricing procedure then utilizes the retrieved pricing information in calculating a price.

(135) The R3 documentation describes how pricing information is retrieved when pricing a sales order. The description includes the use of the condition technique, including condition records, access sequences and pricing procedures, as shown below:
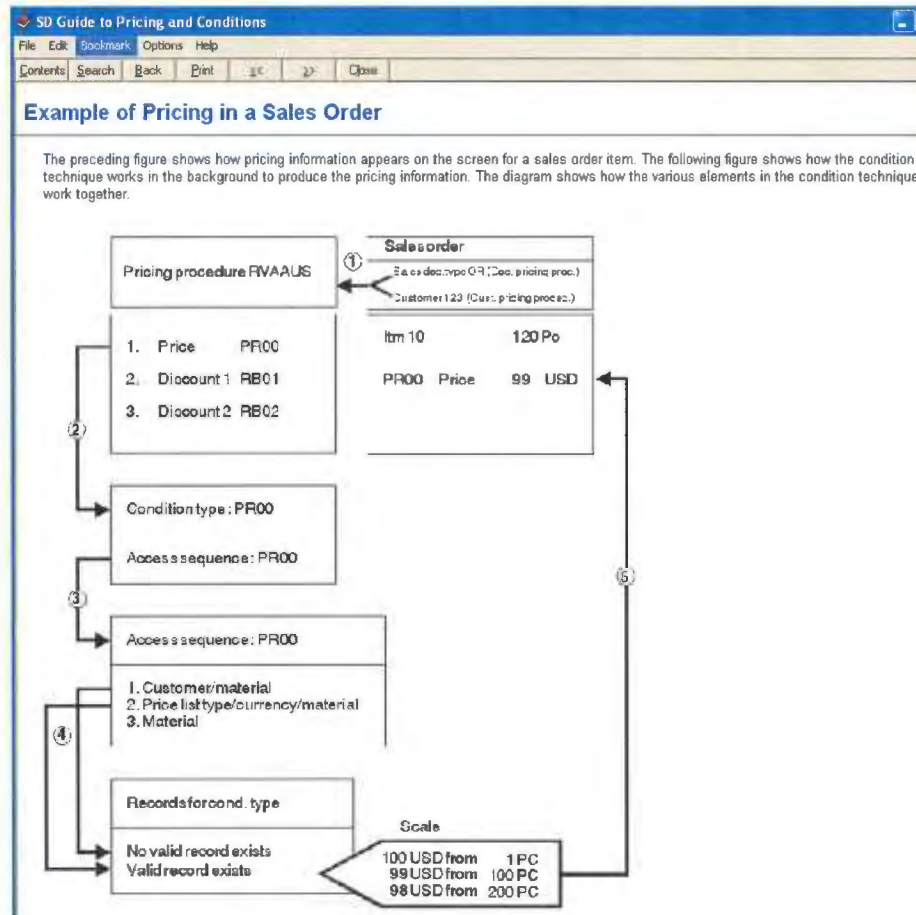
SAP-00029642-3; SAP-00013943-4.

(136) The documentation describes using a pricing procedure (RVAAUS in the above example) to indicate what condition types should be used to calculate a price for the sales order. The pricing procedure indicates the order in which the system should apply condition types; in the example the condition types are PR00,

RB01, and RB02. Each condition type retrieves pricing information. Associated with each condition type is an access sequence that specifies the order in which condition tables should be searched to find an applicable condition record. For the PR00 condition type, the access sequence is also named PR00.

(137) Each access sequence indicates the order in which condition records will be retrieved from their condition tables. In the example, the PR00 access sequence indicates that the system should first retrieve a price from the "Customer/material" condition table, then a price from the "Price list type/currency/material" condition table, and finally a price from the "Material" condition table. The "Price list type" is described in the R3 documentation as a grouping of customers that share pricing information. In this example, the access sequence is ordered from the most specific to the most general. The customer hierarchy example below shows retrieving according to the level in the hierarchy starting with the customer.

Using Customer Hierarchies During Sales Order Processing

Pricing in the Sales Order

In the standard version, the system determines hierarchy-related pricing in the sales order (condition types HI01 and HI02) by searching for valid condition records at each level in the hierarchy path, starting with the lowest level. As soon as the system finds a valid condition record, it stops the search. If the same kind of condition record (say, a material discount) is stored at two different levels in the hierarchy, the system takes the first valid record at the lowest level. In Customizing for Sales, you can specify your own access sequences.

By using exclusion groups, you can, for example, specify that if similar condition records exist at different levels of the hierarchy, the system takes the most favorable price or discount for the customer (regardless of which level in the hierarchy the pricing data comes from).

Example of Pricing in Use

In the previous example, the customer hierarchy represents the Smith nation-wide buying group. The central office - Smith Central - is defined as the top node in the hierarchy. The regional offices of the buying group - Smith South, North, Northwest, and Northeast - are defined as nodes. During negotiations, you establish a pricing agreement for a particular product line. You offer a national discount, available for all Smith stores. In addition, you offer a special promotional discount for Smith North. You create the corresponding pricing condition records for the Smith Central and Smith North nodes. A subsequent sales order from customer 2742 gets the national discount. When customers 2743 and 2744 place orders, however, the system determines pricing by applying the pricing data stored for Smith North.

Copying Hierarchy Info Between Documents

The copying of hierarchy information between documents is controlled, as usual, by copying routines specified in document flow. You can specify, for example, which hierarchy-related data is copied or redetermined when you copy data from a quotation into a sales order or from a sales order into an invoice. You create and specify copying routines in Customizing for Sales.

Inverted Display of Customer Hierarchy

In addition to being able to display the hierarchy path for a particular sales order, you can also display information about a particular node. For example, you can display which customers and nodes are assigned to the node. When you select this view of a node, the system displays all the relevant assignments.

Procedure

To display the assignments of a particular node, proceed as follows:

1. Select *Logistics → Sales/distribution → Master data* in the main menu screen.

   You reach the *Sales & Distribution Master Data* screen.

2. Select *Business partners → Customer hierarchy → Change*.

   You reach the selection screen for customer hierarchies.

3. Enter a customer hierarchy type (the standard version includes only one type, A), a validity date, and select *Execute*.

   The system displays a list of existing customer hierarchies that are valid for the date you entered.

4. Place your cursor on the node for which you want to display assignments and select *Edit → Nodes → All assignments*

   A dialog box lists all the assignments that belong to the node you selected.

SAP-00029624-5; SAP-00013925-6.

See SAP-00023355-6, SAP-00029499-500, SAP-00029510-32, SAP-00029537-58, SAP-00029615-26, SAP-00029633-700, SAP-00029706; SAP-00008915-6, SAP-00013796-7, SAP-00013807-29, SAP-00013834-55, SAP-00013916-27, SAP-00013934-4004, SAP-00014011-2.

> **e. Sorting the pricing information according to the pricing types, the product, the purchasing organization, the hierarchy of product groups, and the hierarchy of organizational groups;**

(138) I find nothing in the claim language that requires that the sorting happen after the retrieving has completed. In other words, the sorting step could
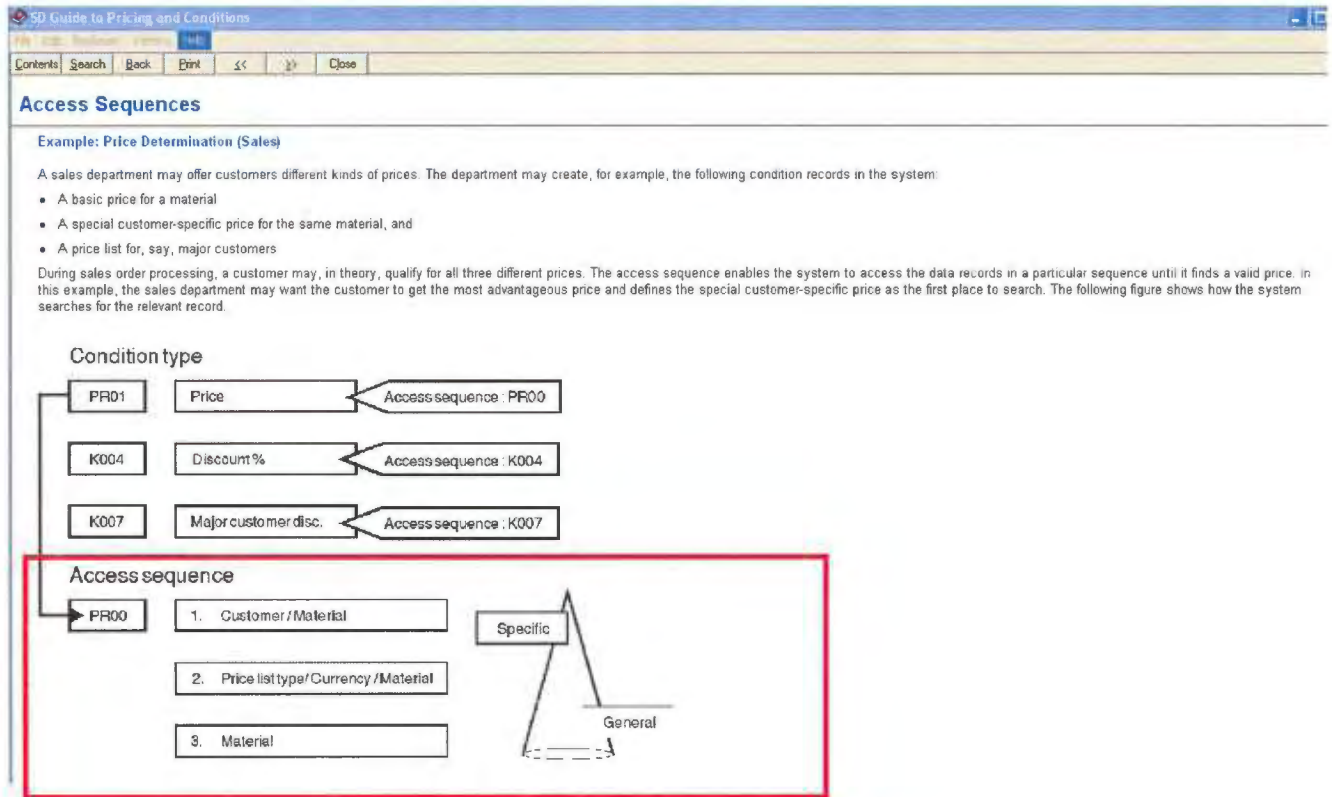
occur before the retrieving step. Also, in my opinion, a system that interleaved retrieving and sorting would satisfy these elements. Such a system, for example, may retrieve some pricing information, sort that pricing information, retrieve some additional pricing information, sort that additional pricing information, etc.

(139) The claimed sorting element is accomplished by the condition technique. The condition technique performs sorting at two levels. First, the pricing procedure defines the order in which condition types will be used to determine a price; all condition records retrieved are therefore first sorted according to the condition type to which they belong. Second, the access sequence determines the order in which condition records will be retrieved for each condition type. Each of these sorts—performed by the pricing procedure and the access sequence—individually satisfies the broadest reasonable interpretation of the claimed sorting step.

(140) The access sequence itself satisfies the claimed sorting step in two ways based on the setting of the exclusive access indicator in each access sequence. Whether the exclusive access indicator is set or not, the access sequence defines the order in which condition records should be retrieved, and the access sequence accomplishes the required sorting in order to respect this defined order.

(141) When the exclusive access indicator is not set, all condition records are retrieved from their corresponding condition tables and ordered in the order

defined by the access sequence. In this example, this results in the sorting of the retrieved condition records from most general to most specific. When the exclusive access indicator is set, the access sequence accesses each condition table in turn to determine whether the table contains pricing information (a condition record) for this particular sale. For example, the table may not have a condition record that matches the particular customer and product, in which case the access sequence searches the next table. This process continues until a condition record that matches the criteria of the particular sale is returned from a table. At that point, the process stops. The condition records are searched in a specific order, and therefore, the access sequence's search according to this order satisfies the sorting element.

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Access Sequences

Example: Price Determination (Sales)

A sales department may offer customers different kinds of prices. The department may create, for example, the following condition records in the system:

- A basic price for a material
- A special customer-specific price for the same material, and
- A price list for, say, major customers

During sales order processing, a customer may, in theory, qualify for all three different prices. The access sequence enables the system to access the data records in a particular sequence until it finds a valid price. In this example, the sales department may want the customer to get the most advantageous price and defines the special customer-specific price as the first place to search. The following figure shows how the system searches for the relevant record.

Condition type

PR01	Price	Access sequence : PR00
K004	Discount %	Access sequence : K004
K007	Major customer disc.	Access sequence : K007

Access sequence

PR00	1. Customer / Material
	2. Price list type / Currency / Material
	3. Material

Specific

General

SAP-00029659; SAP-00013962-3.

The exclusive access indicator is described below:

Exclusive Access Indicator

You specify in this field whether you want the system to stop when it finds a valid condition record for the access. If you do not mark the exclusive access indicator, the system continues to make each access in the sequence, finally proposing the last valid condition record it finds.

In the earlier example of access sequences for Sales and Purchasing where the indicator is set for each access, the system stops when it finds the first valid condition record. Alternatively, it would be possible to not set the indicator and to reverse the order of the accesses and have them starting with the most general condition records and ending with the most specific (in this case, the customer/material price). In the sales order, the system would then list all the condition records it found but would only use the last one. You would then be able to see all the various possible prices that apply to the particular document.

SAP-00029663-4; SAP-00013967-8.

See SAP-00029633-700, SAP-00029706; SAP-00013934-4004, SAP-00014011-2.

f. Eliminating any of the pricing information that is less restrictive; and determining the product price using the sorted pricing information.

(142) As I discussed above, I find the term "pricing information that is less restrictive" unclear and insolubly ambiguous. Nevertheless, I have performed an analysis using the following definition: "pricing information that is defined higher in the hierarchy."

(143) The claimed eliminating step is performed by the condition technique. As described previously, the combination of the pricing procedure and the access sequence determines the order in which the pricing information is retrieved. Whether the exclusive access indicator is set or not, the condition technique satisfies the required eliminating of less restrictive pricing information.

(144) When the exclusive access indicator is not set, the condition technique will retrieve all of the condition records in the order specified in the access sequence. In this case, the access sequence is ordered from the most general to the most specific. Once all condition records have been retrieved, the R3 documentation specifies that all but the last condition record found will be eliminated and only the last one, the most specific one, will be used.

(145) When the exclusive access indicator is set, the condition technique will retrieve just one condition record. In this case, the access sequence is ordered from the most specific to the most general. The R3 documentation specifies that

the condition technique will stop when it finds the first condition record that satisfies the criteria for a particular sale, thereby eliminating any of the pricing information that is less restrictive.

(146) When the less restrictive pricing information has been eliminated as described above, the condition technique determines the product price using the sorted price information. The following example from the R3 documentation of pricing a sales order displays all of the pricing information used to determine the product price. In this example, the four pieces of pricing information used are price, customer discount, freight, and state sales tax. When these four pieces of pricing information have been used to determine the product price, the net value (final price) for the order is computed to be $1772.26 USD.

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Example of Pricing in a Sales Order

The following figure shows the pricing information for an item in a sales order. The pricing screen for the item shows the gross price that the customer is charged, several discounts for which the customer qualifies, and other pricing elements, such as freight and sales taxes. The condition types that apply to each of these pricing elements appear on the left side of the pricing screen. The sequence in which the various condition types appear is determined by the pricing procedure.

Standard Order Create: Item Conditions

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Details | Delete | New pricing | Condition record

Item   10   Net value   in   USD   1,708.20
Quantity   128.000   FL   Tax amount   64.06
Material   E-4000   Pennsylvania's Finest

	CnTy	Description	Rate	Curr.	per	UoM	Cond. value	USD
☐	PR00	Price	14.00	USD	1	FL		1,680.00
☐		Gross	14.00	USD	1	FL		1,680.00
☐	K007	Customer discount	1.000-	%				16.80-
☐		Discount Amount	0.14-	USD	1	FL		16.80-
☐	KF00	Freight	0.50	USD	1	KG		45.00
☐		Net Value 2	14.24	USD	1	FL		1,708.20
☐	UTX1	State sales tax	3.750	%				64.06
☐		Net value for ord.	14.77	USD	1	FL		1,772.26
☐	VPRS	Cost	6.00	USD	1	L		540.00
☐		Profit Margin	9.74	USD	1	FL		1,168.20

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SAP-00029642; SAP-00013943.

(147) In the following step-by-step description of the pricing process, the R3 documentation shows how the product price is determined using the pricing information associated with each condition type in the pricing procedure.

Example of Pricing in a Sales Order

Records for cond. type

No valid record exists
Valid record exists

Scale

100 USD from   1 PC
99 USD from   100 PC
98 USD from   200 PC

Step-by-step Description

1 The system first determines the procedure according to information defined in the sales document type and the customer master record.

2 The pricing procedure defines the valid condition types and the sequence in which they appear in the sales order. In the example above, the system takes the first condition type (PR00) in the pricing procedure and begins the search for a valid condition record.

3 Each condition type in the pricing procedure can have an access sequence assigned to it. In this case, the system uses access sequence PR00. The system makes the specified accesses until it finds a valid condition record. (Although this diagram does not show it, each access specifies a particular condition table. The table provides the key with which the system searches for records).

4 In the example, the first access (searching for a customer-specific material price) is unsuccessful. The system moves on to the next access and finds a valid record.

5 The system determines the price according to information stored in the condition record. If a pricing scale exists, the system calculates the appropriate price. In the example, the sales order item is for 120 pieces of the material. Based on the quantity, the system determines a price of $99 per piece.

The system repeats this process for each condition type in the pricing procedure and comes up with a final price.

SAP-00029643; SAP-00013944-5.

(148) The condition technique both eliminates any of the pricing information that is less restrictive and determines the product price using the sorted pricing information. The R3 documentation, therefore, discloses every element of claims 26 and 17, thus rendering the claims unpatentable. *See* SAP-00029624-5, SAP-00029633-700; SAP-00013925-6, SAP-00013934-4004.

D.   The R3 Documentation and U.S. Patent No. 6,553,350 claim 28 and 27:

(149) Claim 28 and claim 27, the claim from which claim 28 depends, follow:

28. A computer readable storage media comprising: computer instructions to implement the method of claim 27.

27. A computer implemented method for determining a price of a product offered to a purchasing organization comprising:

retrieving from a data source pricing information that is (i) applicable to the purchasing organization and (ii) from one or more identified organizational groups, within a hierarchy of organizational groups, of which the purchasing organization is a member;

retrieving from the data source pricing information that is (i) applicable to the product and (ii) from one or more identified product groups, within a hierarchy of product groups, of which the product is a member; and

receiving the price of the product determined using pricing information applicable to the one or more identified organizational groups and the one or more identified product groups according to the hierarchy of product groups and the hierarchy of organizational groups.

(150) As I discuss below, each step of claim 27 is merely a broader version of those found in claim 17, and thus, the evidence and analysis I provide above for claims 26 and 17 also demonstrates that claim 27 is similarly unpatentable.

1. Claim 28: Computer readable storage media:

(151) As I mentioned above with respect to claim 26, the R3 documentation inherently discloses a computer readable storage media with computer instructions.

2. Claim 27: A computer implemented method for determining a price of a product offered to a purchasing organization comprising:

(152) As I described previously, the R3 documentation describes an enterprise information system that includes a Sales and Distribution module that determines the price of a product.

> **a. retrieving from a data source pricing information that is (i) applicable to the purchasing organization and (ii) from one or more identified organizational groups, within a hierarchy of organizational groups, of which the purchasing organization is a member;**

(153) In claim 17 above, I provided an analysis for the "arranging a hierarchy of organizational groups" element which demonstrates that the R3 documentation discloses a hierarchy of organizational groups of which a purchasing organization is a member. I also provided an analysis for claim 17's "retrieving" element that demonstrates that the R3 documentation discloses retrieving pricing information that is applicable to a purchasing organization and from one or more identified organizational groups within the hierarchy, of which the purchasing organization is a member. The analysis and evidence for those two elements in claim 17, therefore, demonstrates that this element of claim 27 is disclosed by the R3 documentation. For more details, see the evidence and my analysis for the claim elements "arranging a hierarchy of organizational groups" and "retrieving" in claim 17.

> **b. retrieving from the data source pricing information that is (i) applicable to the product and (ii) from one or more identified product groups, within a hierarchy of product groups, of which the product is a member; and**

(154) In claim 17 above, I provided an analysis for the "arranging a hierarchy of product groups" element which demonstrates that the R3 documentation discloses a hierarchy of product groups of which a product is a member. I also provided an analysis for claim 17's "retrieving" element that demonstrates that the R3 documentation discloses retrieving pricing information that is applicable to a product and from one or more identified product groups within the hierarchy of product groups, of which the product is a member. The analysis and evidence for those two elements in claim 17, therefore, demonstrates that this element in claim 27 is disclosed by the R3 documentation. For more details, see the evidence and my analysis for the claim elements "arranging a hierarchy of product groups" and "retrieving" in claim 17.

> **c. receiving the price of the product determined using pricing information applicable to the one or more identified organizational groups and the one or more identified product groups according to the hierarchy of product groups and the hierarchy of organizational groups.**

(155) Claim 17's "retrieving," "eliminating" and "determining" elements encompass this functionality. Thus, the evidence and my analysis of these three elements above demonstrates that the R3 documentation discloses claim 27's "receiving the price of a product determined using pricing information applicable

to the one or more identified organizational groups and the one or more identified product groups according to the hierarchy of product groups and the hierarchy of organizational groups." For more details, see the evidence and my analysis for the "retrieving," "eliminating," and "determining" claim elements in claim 17.

E. The R3 Documentation and U.S. Patent No. 6,553,350 claim 29

(156) Claim 29 follows:

> 29. An apparatus for determining a price of a product offered to a purchasing organization comprising:
>
> a processor;
>
> a memory coupled to the processor, wherein the memory includes computer program instructions capable of:
>
> retrieving from a data source pricing information that is (i) applicable to the purchasing organization and (ii) from one or more identified organizational groups, within a hierarchy of organizational groups, of which the purchasing organization is a member;
>
> retrieving from the data source pricing information that is (i) applicable to the product and (ii) from one or more identified product groups, within a hierarchy of product groups, of which the product is a member; and
>
> receiving the price of the product determined using pricing information applicable to the one or more identified organizational groups and the one or more identified product groups according to the hierarchy of product groups and the hierarchy of organizational groups.

(157) Claim 29 is virtually identical to claim 28 and 27, except that it recites

an "apparatus," a "processor," and a "memory coupled to the processor." The R3

documentation discloses an enterprise information system, which is an apparatus

and which necessarily includes both a memory and a processor that are coupled

together. Therefore, these claim elements are disclosed by the R3 documentation.

Furthermore, my analysis and the evidence I present for claims 28 and 27, which

references my analysis of claims 26 and 17, demonstrates that the other elements

of claim 29 are disclosed by the R3 documentation. Accordingly, claim 29 is also

unpatentable over the R3 documentation.

XIII. Unpatentability Over the R3 Documentation Using the Broadest Reasonable Interpretation

(158) As my analysis shows above, I have reviewed the R3 documentation

and it is my opinion that this reference discloses each feature of claims 17 and 26-

29, thus rendering those claims unpatentable. In particular, under the broadest

reasonable interpretation of claims 17 and 26-29, those claims are anticipated by

the R3 documentation as a prior art printed publication. Claims 17 and 26-29 are

also anticipated because the R3 documentation made the subject matter of those

claims known by others in the United States before June 16, 1995. I provide a

detailed substantive analysis in the form of a claim chart, which is attached to this

declaration as Appendix C. I provide only exemplary evidence herein as well as

my claim chart to support my conclusions. However, I reserve the right to rely

upon any of the evidence in the 2.2A and 2.2B CDs, namely SAP-00000001-00014295 and SAP-00014296-00029980.

A. Printed Publication

1. Public accessibility

(159) As I discussed above, the R3 documentation was publicly accessible prior to June 16, 1995.

2. Enablement

(160) A person of ordinary skill would have been able to practice the invention of claims 17 and 26-29 of the '350 patent based on the disclosure in the R3 documentation without undue experimentation. I am familiar with the capabilities of a person of ordinary skill in the art (I have worked with and directed many such persons over the course of my career), and in my opinion such a person could have used their programming skills and general knowledge to easily implement the invention of claims 17 and 26-29 of the '350 patent using the R3 documentation as a guide. In fact, given the level of detail provided in the R3 documentation, only routine programming skill would be necessary to implement a system that practiced the invention of claims 17 and 26-29. For example, the R3 documentation describes the functionality that the pricing system performs, the step-by-step processing of the pricing system, the data structures used by the pricing system, and the interaction between the data structures used by the system.

Additionally, the R3 documentation provides comprehensive guidance on setting up the system for use (e.g., defining the condition technique and all of its components). Below, I provide a few examples of the level of detail disclosed in the R3 documentation. However, my claim chart provides many more examples.

(161) The following example shows the data structures appropriate for implementing the invention would have been apparent to a person of ordinary skill in view of the following disclosure from the R3 documentation:
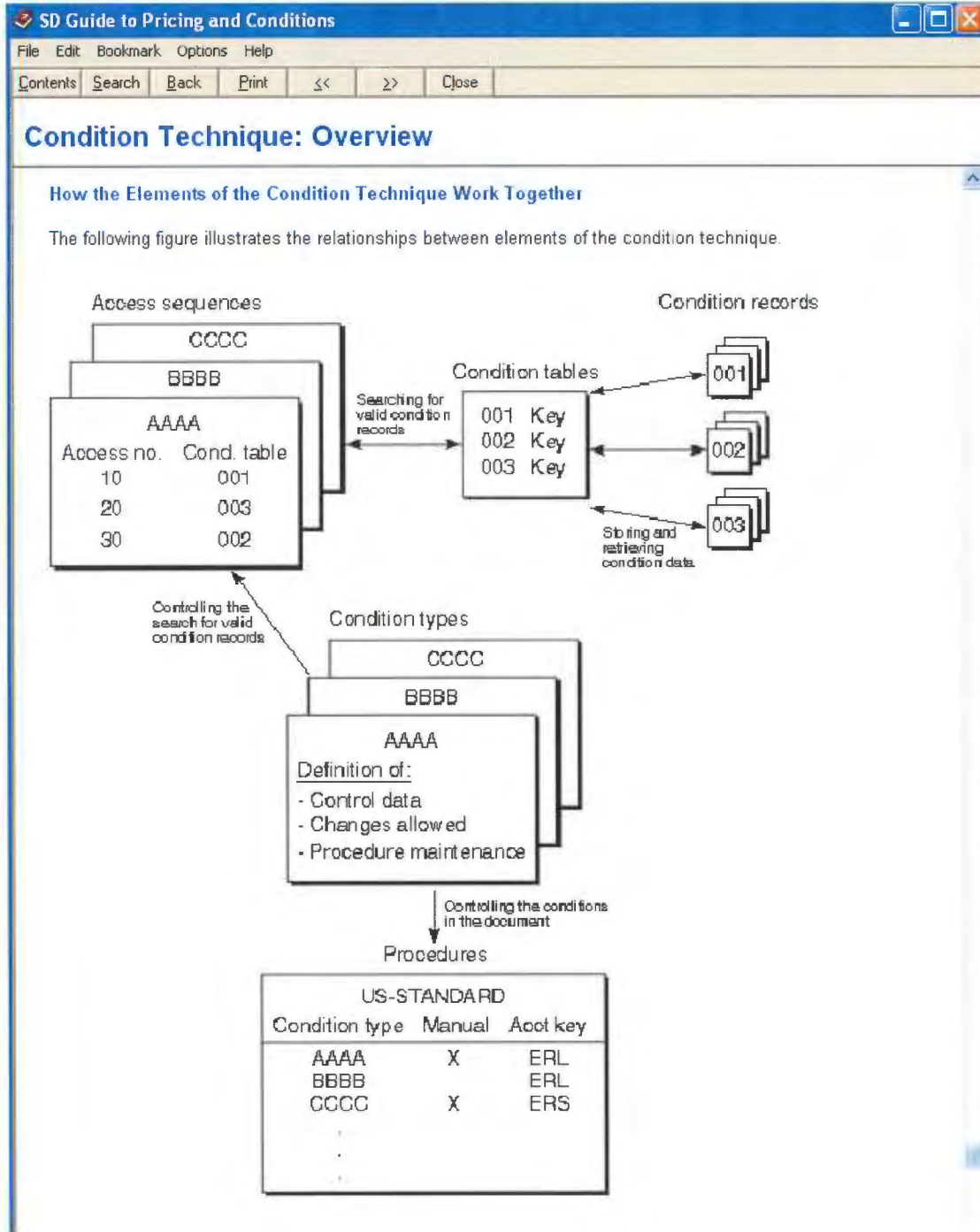
This diagram shows how the various elements of the Condition Technique (pricing

procedures, condition types, access sequences, condition tables, and condition

records) are structured and linked together. Give this disclosure, a person of ordinary skill would have easily been able to implement these elements. Moreover, the following example shows that the R3 documentation discloses a clear step-by-step procedure for determining a price using the Condition Technique, in accordance with the invention:

SAP-00029645; SAP-00013944-5.

Also, the implementation of customer hierarchies and product hierarchies would have been readily apparent to a person of ordinary skill in the art in view of, e.g., the following disclosures in the R3 documentation:

Building a Customer Hierarchy

SAP-00029617; SAP-00013919.

Grouping Materials

Materials can be grouped according to different criteria. This allows for easier management and better evaluation of materials with similar features. The standard version of the SAP R/3 System does not provide exact criteria to differentiate between individual groupings. These criteria can be defined by the company to meet their specific demands. The groupings are determined and defined by the system administrator. Contact him, if you have questions concerning the existing groupings. In the standard version of the SAP R/3 System the following groupings are possible, for example:

- Material group
- Material pricing group
- Product hierarchy

Material Group

Goods with the same features (for example, nails) can be grouped using the field *Material group*. Unlike the product hierarchy, the material group does not contain different levels or possible combinations of goods. You can, however, use the material group to carry out different analysis functions. The material group is defined by a nine-digit, alphanumeric key. It is not primarily of importance for sales and distribution, but is used mainly in materials management.

Material Pricing Group

The material pricing group can also be used to group materials, especially for pricing and for analyses. The material pricing group is defined by a two-digit, numeric key.

Product Hierarchy

The product hierarchy is used to group materials by combining different features. It is used for analyses and pricing. A product hierarchy can consist of up to eighteen characters. Its features can be combined in various ways. The following figure gives an example of how materials can be grouped using product hierarchies.

In this case, a dishwasher can be described by product hierarchy 000100002000000002. This series of characters states that dishwashers belong to the category electrical *appliances* (series of characters 00001, position 1-5), and also to *wet appliances* (series of characters 00002, position 6-10) and, finally, to *dishwashers* (series of characters 00000002, position 11-18).

SAP-00029548-9; SAP-00013845-6.

(162) In addition, the R3 documentation contains a detailed description of the underlying object classification systems used to represent customer and material master records and examples of characteristics used in the object classification system.

Tasks of a Classification System

Object description systems, which today are often better known as classification systems, have now been in use in companies for many years.

The task of a classification system is to describe objects by using characteristics and to group similar objects together. The objects are grouped in classes according to any criteria required. The grouping of objects in classes and their description by means of characteristics is known as classification.

The search for objects is then carried out by using the classes and the characteristics defined in them. This guarantees that objects with similar or identical characteristics can be found as fast as possible.
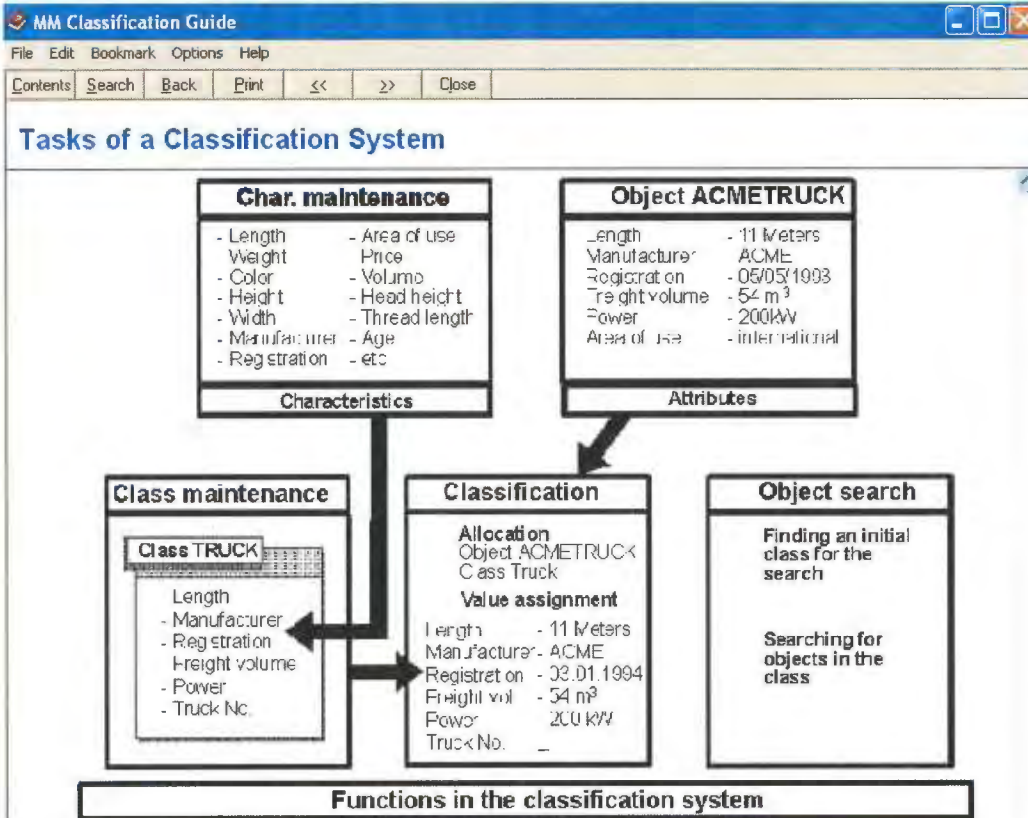
Structuring and Using a Classification System

Before being able to search for objects, you first have to set up the classification system in any system you might be using. This consists of several steps:
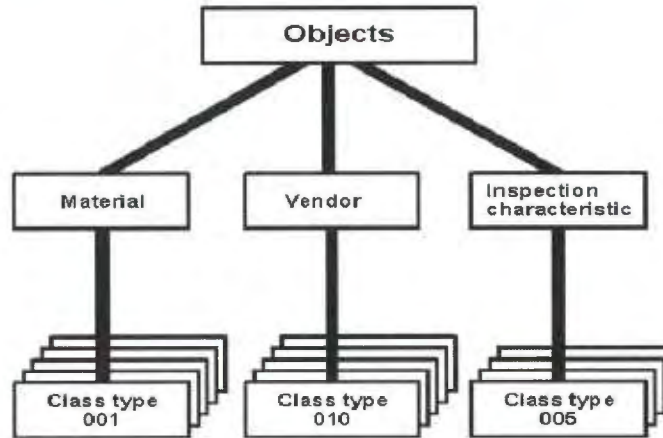
- Creating Classes
  The first step in the setting-up of a classification system is the creation of classes. This is necessary because objects have to be allocated to classes before they can be found. The classes contain characteristics which represent the attributes of the objects to be classified.

- Allocating Objects
  After the classes necessary for the classification have been created, the objects can then be allocated to these classes. The objects are described by means of the characteristics in the class. In the classification of the objects, values have to be entered for the characteristics.

  Once classes have been set up and the objects classified in a class, the classification system can be used to find objects with certain attributes.

- Finding Objects
  Two steps are necessary to find a certain object:

  - finding the class in which the objects were classified.

  - searching for the required objects in the class

  During the search, the characteristics are used as search criteria and the values entered for the characteristics compared with the values of the objects classified in the class.

The following illustration provides an overview of the functions available within the classification system.

SAP-00015190; SAP-00000908.

Tasks of a Classification System

Char. maintenance

- Length   – Area of use
  Weight   Price
- Color   – Volume
- Height   – Head height
- Width   – Thread length
- Manufacturer   – Age
- Registration   – etc

Characteristics

Object ACMETRUCK

Length   – 11 Meters
Manufacturer   ACME
Registration   – 05/05/1993
Freight volume – 54 m³
Power   – 200kW
Area of use   – international

Attributes

Class maintenance

Class TRUCK

Length
- Manufacturer
- Registration
Freight volume
- Power
- Truck No.

Classification

Allocation
Object ACMETRUCK
Class Truck

Value assignment

Length   – 11 Meters
Manufacturer – ACME
Registration – 03.01.1994
Freight vol   – 54 m³
Power   200 kW
Truck No.   _

Object search

Finding an initial
class for the
search

Searching for
objects in the
class

Functions in the classification system

SAP-00015191; SAP-00000909.

SAP-00015194-5 SAP-00000912-3.

(163) Accordingly, given the R3 documentation's detailed disclosure of the

data structures and other elements necessary to implement the invention of claims

17 and 26-29, it would have only required routine programming well within the

skill level of a person of ordinary skill to implement the invention. Certainly, no

undue experimentation would have been required. In my opinion, if someone with

at least a Bachelor's degree in computer science and two years of experience

working with computerized financial systems (or a Master's degree in computer

science and one year of experience working with computerized financial systems)

were provided with the R3 documentation, that person would have had no difficulty implementing the invention of claims 17 and 26-29. In other words, based on the disclosure in the R3 documentation, the public was in possession of the claimed invention before June 16, 1995.

B. Known by Others

1. Public accessibility

(164) As I previously stated, the knowledge available from the R3 documentation was publicly accessible before June 16, 1995.

2. Enablement

(165) In addition, as I previously stated, the knowledge available from the R3 documentation was sufficient to enable a person of ordinary skill in the art of computerized financial systems to practice the invention of claims 17 and 26-29 without undue experimentation.

XIV. Anticipation of Denormalized Numbers

(166) As I mentioned above, the patent owner's trial interpretation of denormalized numbers should be within the broadest reasonable interpretation of that term. I already applied above this interpretation in my anticipation analysis, and I discuss it in greater detail here. I note that if denormalized numbers were not

included within the BRI, the R3 documentation would still anticipate the '350 patent.

(167) As I mention above, per the patent owner's interpretation, a user associates the units with the number and specifies how the number is to be applied (e.g., discount) at data entry time and then, at runtime, the system simply uses that information. This is precisely what the R3 documentation discloses. In the following excerpt, the user associates the number (e.g., "1.000-") with the units (e.g., "%") and specifies how the number is to be applied (e.g., "K007 Customer discount"). The R3 online documentation then discloses using this information at runtime to calculate the final price ($1,772.26).

Example of Pricing in a Sales Order

The following figure shows the pricing information for an item in a sales order. The pricing screen for the item shows the gross price that the customer is charged, several discounts for which the customer qualifies, and other pricing elements, such as freight and sales taxes. The condition types that apply to each of these pricing elements appear on the left side of the pricing screen. The sequence in which the various condition types appear is determined by the pricing procedure.

Standard Order Create: Item Conditions

Edit Goto System Help

Details Delete New pricing Condition record

Item	10		Net value	in	USD		1,708.20
Quantity	120.000	FL	Tax amount				64.06
Material	E-4000		Pennsylvania's Finest				

	CnTy	Description	Rate	Curr.	per	UoM	Cond. value	USD
	PR00	Price	14.00	USD	1	FL		1,680.00
		Gross	14.00	USD	1	FL		1,680.00
	K007	Customer discount	1.000-	%				16.80-
		Discount Amount	0.14-	USD	1	FL		16.80-
	KF00	Freight	0.50	USD	1	KG		45.00
		Net Value 2	14.24	USD	1	FL		1,708.20
	UTX1	State sales tax	3.750	%				64.06
		Net value for ord.	14.77	USD	1	FL		1,772.26
	VPRS	Cost	6.00	USD	1	L		540.00
		Profit Margin	9.74	USD	1	FL		1,168.20

OVR NUM 13:36

SAP-00029642; SAP-00013943.

The R3 documentation, therefore, discloses and anticipates the patent owner's interpretation of denormalized numbers. I provide more support for this in my attached claim chart.

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XV. The Claims are Anticipated Under the Patent Owner's Claim Construction

(168) I have been advised that the patent owner asserts that these claims would be infringed by computer source code that is capable of performing the operations in the claims without modifying the source code. The patent disclosure, however, includes prior art systems that would contain computer source code that is capable of performing the operations in the claims without modifying the source code.

(169) The patent admits that the prior art includes databases, pricing applications, and pricing systems. Exh. 1001, Col. 2:20-60. The patent also admits that the prior art had the ability to store, retrieve, and maintain the same data (e.g., pricing information for products and organizations) as the claims. *Id.*, Col. 1:36 - Col. 2:27; Col. 4:6-9. Moreover, the patent admits that the prior art used hierarchies, such as an organizational hierarchy. *Id.*, Col. 12:4-6. The patent further admits that the prior art can perform pricing calculations based on this data. *Id.*, Col. 2:24-26. Indeed, the patent even admits that R/3 is prior art. *Id.*, Col. 2:56-59.

(170) I have also been informed that inventor also admitted that the prior art supported the use of customer hierarchies and pricing hierarchies for pricing and that he did not invent the concept of applying hierarchies to pricing.

(171) Thus, the applicant has admitted that the prior art could store, retrieve, and maintain the claimed data, use the claimed data structures, and perform calculations on the claimed data. The claims, however, merely recite a combination of steps that store, retrieve, maintain, and perform calculations on the claimed data. Accordingly, as the prior art already had these capabilities, the prior art was capable of perform the claimed operations without modifying the prior arts source code.

(172) For example, some the prior art (e.g., databases) would store, retrieve, maintain, and perform calculations on the claimed data using instructions written in a query language, such as SQL. In order to run queries written in a particular query language, the source code of a prior art system would have included support for instructions written in that query language. Thus, such a prior art system would have been able to perform the claimed operations without modification to its source code. Accordingly, under the patent owner's construction, the claims are anticipated by the applicant's admitted prior art.

XVI. Availability for Cross-Examination

(173) In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place

within the United States. If cross examination is required of me, I will appear for cross examination within the United States during the time allotted for cross examination.

XVII. Right to Supplement

(174) I reserve the right to supplement my opinions in the future to respond to any arguments that Versata raises and to take into account new information as it becomes available to me.

XVIII. Jurat

(175) I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

(176) I declare under penalty of perjury that the foregoing is true and correct.

_____
Michael Siegel, Ph.D.

_____9/15/12_____
Date

APPENDIX A

Michael D. Siegel
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Education

1989	Ph.D. in Computer Science, Boston University, Boston, MA.
1985	M.A. in Computer Science, Boston University, Boston, MA.
1980	M.S. in Engineering, Department of Mechanical Engineering, University of Wisconsin-Madison.
1977	BS in Engineering, Trinity College, Hartford, CT.

Academic and Research Positions

1993-	Principal Research Scientist, Massachusetts Institute of Technology. Research areas include intelligent integration of information systems, data semantics, data standards, web-based information extraction and integration, global risk management, information security, financial applications, pre-conflict analysis, and improving safety, operations and management using dynamic modeling and health information systems, policy and process.
1998	Senior Lecturer, Sloan School of Management, Massachusetts Institute of Technology, " Information Technology for Financial Services."
1989-1993	Research Scientist, Sloan School of Management, Cambridge, MA. Research areas include distributed heterogeneous information systems, knowledge discovery, technology and risk management, and management of data semantics. Instructor for Information Technology II.
1989	Research Associate, Boston University, Boston, MA. Post-doctoral research position. Research areas: rule-based semantic query optimization, intelligent database systems and knowledge discovery in databases.
1987	Member Technical Staff, Knowledge-Based Systems Department, GTE Laboratories, Waltham, MA. Research and design of heterogeneous database systems.

1985-1986	Lecturer, Northeastern University, Boston, MA. Instructor for the graduate course in database theory.
1985	Computer Scientist, Computer Corporation of America (Xerox Advanced Information Technology), Cambridge, MA. Research and design of highly available distributed database systems.
1983-1989	Research Assistant, Boston University, Boston, MA. Research under National Science Foundation Grants IST-8214662, IST-8408551 and IST-8710137. Research areas: query optimization, distributed database systems, natural language database updates, and knowledge discovery in databases.
1978-1980	Research Assistant, Solar Energy Lab, University of Wisconsin-Madison. Research areas: systems analysis, simulation and development of simplified design methods for photovoltaic systems.

Administrative Positions

2006-2010	Director Special Interest Group on Digital Health. Center for Digital Business at MIT
2001- 2004	Director Global Financial Services Special Interest Group. Center for eBusiness at MIT
1996-1999	Co-Director, Finance Research Center (FRC).
1992-1996	Associate Director, International Financial Research Services Center (IFSRC).
1992-	Associate Director, Productivity from Information Technology (PROFIT).
1992	Co- Director, Working Group on Risk Management, International Financial Services Research Center.

Refereed Journal and Conference Publications

2012	Goldsmith, D., and Siegel, M. "Cyber Politics: Understanding the use of Social Media for Dissident Movements in an Integrated State Stability Framework." Proceedings of the 2012 International Conference on Advances in Social Networks Analysis and Mining - Workshop on Multi-Agent Systems and Social Networks. Istanbul, Turkey.
2011	Goldsmith, D., and Siegel, M. "Improving Health Care Management Through the Use of Dynamic Simulation Modeling and Health

Information Systems." Proceedings of the 29th International Conference of the System Dynamics Society. Washington, DC, July 24 – 28, 2011

2010   Goldsmith, D., and Siegel, M. "Improving Strategic Management of Hospitals: Addressing Functional Interdependencies within Medical Care." *International Journal of Information Technologies and Systems Approach*, October 2010.

2010   Siegel, M., and Goldsmith, D. "Simulation Modeling for Cyber Resilience." *Proceedings of the MIT-Harvard Conference on Cyber International Relations: Emergent Realities of Conflict and Cooperation.*

2008   Hongwei Zhu, Stuart E. Madnick, Michael D. Siegel, Enabling global price comparison through semantic integration of web data, International Journal on Electronic Business, IJEB 6(4), 319-353.

2008   Gannon, T, Siegel, M., Madnick, S., Sabbouth, M., Moulton, A., Zhu, H. "Framework for the Analysis of the Adaptability, Extensibility, and Scalability of Semantic Information Integration and the Context Mediation Approach," *Hawaii International Conference on System Sciences - 42*, Hawaii, 2008

2008   Masanori, A., Goldsmith, D., Siegel, M. "Improving Strategic Management of   Hospitals: Addressing Functional Interdependencies within Medical Care," *American Medical Informatics Association Conference*, Washington, D.C., 2008

2008   Morrison, B., Goldsmith, D. "Grappling with Dynamic Complexity in Military Planning: The System Dynamics Approach," *International System Dynamics Conference*, Athens, Greece, 2008

2007   Choucri, N., Goldsmith, D., Madnick, S., Morrison B., Siegel, M. "Using System Dynamics to Model and Better Understand State Stability," *System Dynamics Conference*, Cambridge, MA, 2007

2007   Masanori, A., Goldsmith, D., Siegel, M. "Improving Hospital Operations Using Bar-Code Capture Data and System Dynamics Modeling Techniques," *System Dynamics Conference*, Cambridge, MA, January 2007

2006   Choucri, N., Electris, C., Goldsmith, D., Mistree, D., Madnick, S., Morrison, J., Siegel, M., Sweitzer-Hamilton, M. "Understanding & Modeling State Stability: Exploiting System Dynamics, " *System Dynamics Conference*, Cambridge, MA, 2006

2006   Nazli Choucri, Christi Electris, Daniel Goldsmith, Dinsha Mistree, Stuart Madnick, J. Bradley Morrison, Michael Siegel, Margaret Sweitzer-Hamilton, "Understanding & Modeling State Stability: Exploiting System Dynamics, " *System Dynamics Conference*, Cambridge , MA, January 2006

2005   Nazli Choucri., S. Madnick, M. Siegel, "Linkage Between Pre- and Post-Conflict: Exploiting Information Integration & System Dynamics, " *IEEE Aerospace Conference*, Big Sky , MT, March 2005

2004   Zhu, H., S. Madnick, M. Siegel et al, "Effective Data Integration in the Presence of Temporal Semantic Conflicts" Conference on Temporal Representation and Reasoning, July 2004.

2004   Choucri, N., S. Madnick, A. Moulton, M. Siegel, H Zhu, "Information Integration for Counter Terrorism: The Requirement for Context Mediation" *IEEE Aerospace Conference*, Big Sky , MT, March 2004.

2002   Zhu, H., S. Madnick, M. Siegel. "The Interplay of Web Aggregation and Regulations" (with H. Zhu and M. Siegel), *Proceedings of the IASTED International Conference on Law and Technology* (LAWTECH 2002), Cambridge, MA, November 6-8, 2002 [CISL #2002-17].

2002   Fujii, H., T. Okano, S. Madnick, M. Siegel. "E-Aggregation: The Present and Future of Online Financial Services in Asia-Pacific", *Proceedings of the Sixth Pacific Asia Conference on Information Systems* (PACIS-2002), Tokyo, Japan, September 3-4, 2002 [CISL #2002-06].

2002   Hansen, M., S. Madnick, M. Siegel. "Process Aggregation using Web Services", *Proceedings of the Workshop on Web Services, e-Business, and the Semantic Web: Foundations, Models, Architecture, Engineering and Applications*, (WseBT'02, Toronto, Canada), May 2002 [CISL #2002-05], also to be published in *Lecture Notes in Computer Science*, Springer-Verlag, New York.

2002   Moulton, A., S. Madnick, M. Siegel. "Semantic Interoperability in the Securities Industry: Context Interchange Mediation of Semantic Differences in Enumerated Data Types", *Proceedings of the Second International Workshop on Electronic Business Hubs: XML, Metadata, Ontologies, and Business Knowledge on the Web* (WEBH2002), Aix En Provence, France, September 6, 2002 [CISL #2002-10].

2002   Moulton, A., S. Madnick, M. Siegel. "Context Interchange Mediation for Semantic Interoperability and Dynamic Integration of Autonomous Information Sources in the Fixed Income Securities Industry", *Proceedings of the Workshop on Information Technology and Systems* (WITS), Barcelona, Spain, December 14-15, 2002 [CISL #2002-20].

2001   Moulton, A., S. Madnick, M. Siegel. "Cross-Organizational Data Quality and Semantic Integrity: Learning and Reasoning about Data Semantics with Context Interchange Mediation" (with A. Moulton and M. Siegel),

Proceedings of the Americans Conference on Information Systems (AMCIS, Boston), August 2001 [SWP #4167:4183-01, CeB #108, CISL #01-04.

2001   *Madnick, Stuart and M Siegel, "Seizing the Opportunity : Exploiting Web Aggregation," MISQ Executive, Vol 1, No. 1, March 2002, pp. 35-46. [SWP #4351, CeB #144, CISL #01-13].*

2000   Bresson, Stephane, C. Goh, N. Levina, A. Shah, and M. Siegel, "Context Knowledge Representation and Reasoning in the Context Interchange System," The International Journal of Artificial Intelligence, Neutral Networks, and Complex Problem-Solving Technologies, Volume 12, Number 2, September 2000, pp. 165-180, [SWP #4133, CISL #00-04].

1999   Goh, Cheng, Stephane Bresson, Stuart Madnick, and Michael Siegel , "Context Interchange: New Features and Formalisms for the Intelligent Integration of Information," *Transactions on Information Systems*, Publication expected in July 1999.

1998   Moulton, Allen, Stephane Bressan, Stuart Madnick, and Michael Siegel , "Using an Active Conceptual Model for Mediating Analytic Information Interchange in the Fixed Income Securities Industry," *Proceedings of the 17th International Conference on Conceptual Modeling (ER '98)*, Singapore.

1998   Moulton, Allen, Stuart Madnick, and Michael Siegel , "Context Interchange on Wall Street," *Proceedings of the International Conference on Cooperative Information Systems (CoopIS'98)*, N.Y.

1997   Marshall, Chris and Michael Siegel , "Value at Risk: Implementing a Risk Measurement," *Journal of Derivatives*, Spring, 1997.

1997   Bressan, Stephane, Cheng Goh, Tom Lee, Stuart Madnick and Michael Siegel, "A Procedure for Mediation of Queries to Sources in Disparate Contexts*," Proceedings of the International Logic Programming Symposium*, Port Jefferson, N.Y.

1997   Madnick, S., S. Bressan, K. Fynn, C. Goh, T. Pena, and M. Siegel, "Overview of a Prolog Implementation of the Context Interchange Mediator," Proceedings of the Fifth International Conference and Exhibition on the Practical Applications of Prolog, London, England.

1996   Lee, Jacob and Michael Siegel, " An Ontological and Semantical Approach to Source-Receiver Interoperability," *Decision Support Systems*, Vol. 18, No. 2.

1996 Marshall, Chris and Michael Siegel , "VaR: Implementing a Risk Measurement Standard," *Wharton Conference on Risk Management in Banking*, Philadelphia, Pa.

1996 Lee, Jacob, Stuart Madnick, and Michael Siegel, "Conceptualizing Semantic Interoperability: A Perspective from the Knowledge Level," *International Journal on Cooperative Information Systems*, Accepted for publication.

1995 Goh, Cheng, Stuart Madnick, and Michael Siegel, "Context Interchange: Overcoming the Challenges of Large-Scale Interoperable Database Systems in a Dynamic Environment," In *Proceedings of the Third International Conference on Information and Knowledge Management*, Gaithersburg, MD, pp 337--346.

1994 Sciore, Edward, Michael Siegel and Arnie Rosenthal, "Using Semantic Values to Facilitate Interoperability Among Heterogeneous Information Systems," *ACM Transactions on Database Systems*, Vol. 19, No. 2.

1994 Siegel, Michael, Edward Sciore and Stuart Madnick, "Context Interchange in a Client-Server Architecture," *Journal of Systems and Software*, Volume 27, No. 3.

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1992 Sciore, Edward, Michael Siegel and Arnon Rosenthal, "Context Interchange using Meta-Attributes," In *Proceedings of the First International Conference on Information and Knowledge Management*, Baltimore, MD.

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1982   Siegel, Michael and Peter Deduck, "A Methodology for Determining Preferred Residential Passive Solar Systems," In *Proceedings of the American Section Meeting of the International Solar Energy Society*, Houston, TX.

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2002   Melo de Brito Carvalho, T.C., M. Siegel. "Return on Investment from Online Banking Services: An Analysis of Financial Account Aggregation", Cambridge, MA, August 2002 [SWP #4384-02, CISL #2002-12].

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1989	Siegel, Michael and Stuart E. Madnick, "Maintaining Valid Schema Integration in Evolving Heterogeneous Database Systems," *IEEE Office Knowledge Engineering: Special Issue on Information Sharing in Heterogeneous Data and Knowledge Base Systems*, Vol. 3, No. 2.
1987	Siegel, Michael, "A Survey of Heterogeneous Database Systems," *GTE Laboratories Technical Note TN87-174.1* and Boston University Report TR87-011.

Other Professional Positions

2009-2011	Expert, technology patent litigation.
2008-2009	Expert, technology patent litigation.
2008-2009	Expert, financial services software.
2004	Expert, purchase of a financial software firm by a much larger firm and issues around the purchase price, share registration, valuation and damages.
2003-2005	Advisor for Life Harbor Portfolio Management software firm. Acquired by Vestmark.
2000	Executive Education sessions for British Telecom, Willis Insurance, Program for the Americas

2000	Chief Scientist, Web Aggregation Software, Arsdigita Corporation
1999	Founder, iAggregate (merged with Arsdigita in 2000)
1998	Consultant, Analysis Group Inc. System analysis.
1996-1997	Consultant, American Management Systems. Risk Management Practice.
1997	Arriva Software, Founder, Vice President.
1996	Consultant, Deutsche Bank, Morgan Grenfeld. Analysis of Foreign Exchange Trading Systems.
1995	Course development and presentation, Sequent Computing, Executive course on information technology and business.
1993-1994	Consultant, ABN Amro Bank. Analysis of Financial Risk Management Systems.
1992	Speaker, Digital Equipment Corporation Seminar Series. Presentations on information technology requirements for risk management and the FDICIA Act of 1991. Attendees include major banks, law and accounting firms, and federal regulators.
1991-1992	Consultant, EJV Partners, N.Y., N.Y. Assist in the development of an object-oriented fixed income database system for use by member firms; Goldman Sachs, Morgan Stanley, First Boston, Citicorp, Shearson-Lehman, and Salomon Brothers.
1990	Consultant, General Motors, Detroit, MI. Analysis of distributed database management system for production, marketing and sales.
1990-1997	Information Technology Associates, President.
1990	Consultant, Xerox Advanced Information Systems, Cambridge, MA. Heterogeneous database systems research and applications.
1989	Consultant, Evaluation Associates, Inc., Norwalk CT. Database design, financial software specification and distributed system design.
1989	Consultant, Dawai Securities of America, New York, NY. Design and development of a database management system and application program to assist warrant traders.
1987-1989	Consultant, Investment Management Controls, New York, NY. Managed the conversion of operations from a time-sharing system to a local area

network, database design, financial software specification, and management responsibilities.

1985-1987 Seminar Instructor, Digital Equipment Corporation, Educational Services Division, Bedford, MA. Instruction in OPS5, expert system development and artificial intelligence.

1985-1986 Database Consultant, Gradient Corporation, Cambridge, MA. Designed and developed databases for Environmental Protection Agency Superfund projects.

1983-1985 Computer Graphics and Database Consultant, Cambridge Analytical Associates, Boston, MA. Designed and prepared computer graphics and databases for Environmental Protection Agency Superfund projects.

1981-1983 Staff Engineer, JBF Scientific, Wilmington, MA. Simulation and analysis of electrical and thermal energy systems, prepared proposals, reports and seminars.

1983 Professional Engineer, State of Wisconsin No. E-22176.

1977-1978 Project Engineer, E. F. Siegel & Associates, Ltd., Baltimore, MD. Designed and supervised the installation of heating and air-conditioning systems for commercial and industrial buildings.

Patents

2001 "Querying and Retrieving Semi-Structured Data from Heterogeneous Sources," PAT. NO. 6,282,537, 1999.

1999 "Data Extraction from World Wide Web Pages" with Stuart Mandick, PAT. NO. 5,913,214, 1996.

1999 "Querying Heterogeneous Data Sources Distributed over a Network Using Context Interchange" with Stuart Madnick, PAT. NO. 5,953,716, 1996.

APPENDIX B

Documents and Things Considered by Dr. Michael Siegel

350 Patent

PX5 '350 File History

PX4 '400 File History

R/3 2.2 Online Documentation

[2:07-cv-00153-CE (DI 203)]Claim Construction Order

[2:07-cv-00153-CE (DI 124-2)] Joint Appendix A P.R. 4-3(a) Undisputed Claim Terms, Phrases and Clauses Pricing Patents (5,878,400/6,553,350)

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[2:07-cv-00153-CE (DI 143)] SAP's Expedited Motion for Leave to File Sur-Reply to Plaintiffs' Claim Construction Reply Brief

[2:07-cv-00153-CE (DI 140)] Plaintiffs' Claim Construction Reply Brief

[2:07-cv-00153-CE (DI 139)] Defendants SAP America, Inc. and SAP AG's Reply Brief to Plaintiffs' Opening Claim Construction Brief

[2:07-cv-00153-CE (DI 129)] Plaintiff's Opening Claim Construction Brief

[2:07-cv-00153-CE (DI 124)] Joint Claim Construction and Prehearing Statement Pursuant to Patent Rule 4-3 for U.S. Patent Nos. 6,553,350, 5,878,400 and 7,069,235

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Various Websites

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