

MAY 1999

Retail Systems Alert
..... Group

Supply Chain Systems Study

LEAD ANALYSTS:

Ram Viswanathan
Senior Manager
Ernst & Young

Mohsen Moazami
VP/Director, Global
E-Commerce
Kurt Salmon Associates

ASSOCIATE ANALYSTS:

Dan Berthiaume
Associate Editor
Retail Systems Alert

Roland Faubert
Editor
Supply Chain Alert

John Stiehler
Senior Manager, Global
Enterprise Solutions
Kurt Salmon Associates

PUBLISHER:

Retail Systems Alert Group
PO Box 332
Newton Upper Falls
MA 02464 USA
Phone: (617) 527-4626
Fax: (617) 527-8102
www.retailsystems.com

UNDERWRITER:

QRS, Inc.

OUTLOOK:

AGING SYSTEMS, CONTINUING PREVALENCE OF PAPER AND FAX, AND THE INTERNET CREATE RATIONALE FOR TIGHTER RETAILER-MANUFACTURER INTEGRATION

FINDINGS:

- **Applications.** Aging, stand-alone transportation, customer service, warehouse management, and other supply chain systems require replacement or enhancement to enable a new era of supply chain visibility.
- **Communications.** Fax and other paper-based forms of information exchange persist among small- and medium-size enterprises (SME) that have yet to implement newer systems integrating electronic document data management with internal processes. In comparison, most mega-retailers and their large suppliers build a majority of their relationships primarily around electronically transmitted purchase orders, invoices, and advanced shipping notices.
- **Networks.** The majority of companies continue to conduct batch electronic data interchange (EDI) via value added networks (VANs), with a smaller number of companies conducting data transfers via corporate point-to-point networks or extranets.
- **The Future.** Internet-based EDI, middleware, and object technology will become the foundation of supply chain integration during the next decade.

Bonus Coverage:

The influence of the Voluntary Interindustry Standards Association (VICS) on supply chain trends.

METHODOLOGY

Conducted between June and November of 1998, the study posed questions to retailers and manufacturers about their supply chain systems communications practices. Respondents included both U.S. and international retailers and manufacturers, as well as a significant number of respondents from the Voluntary Interindustry Commerce Standards Association (VICS) (Figure 1). Since its inception more than 10 years ago, VICS has developed EDI standards, shipping container standards, and floor-ready merchandising guidelines for efficient business-to-business communications.

The mix of respondents was evenly divided between the two segments, and affiliations spanned several industry associations (Figure 2).

In all, more than 65 companies (see Appendix, p. 33) responded to the study. These respondents detailed their use of:

- Packages or homegrown internal systems;
- Age of systems;
- Planned systems replacement by 2000;

- Supply chain systems strategies, such as category management, collaborative planning, and vendor-managed inventory;
- EDI transport methods and volume by VANs, point-to-point communications, and the Internet; and,
- EDI processes implemented such as advanced shipping notices (ASNs), price catalog, electronic receipt settlement (ERS), and others.

For clarity, the study has been segmented into five sections and includes both graphs and analytical commentary. Because of their contribution to supply chain systems and practices evolution, VICS members were analyzed separately as well as in conjunction with other respondents. In figures 3A through 6C, analysis is provided for each individual figure. In figures 7A through 13C, analysis is provided collectively for each section of three figures, because the nature of these particular responses makes individual analysis redundant.

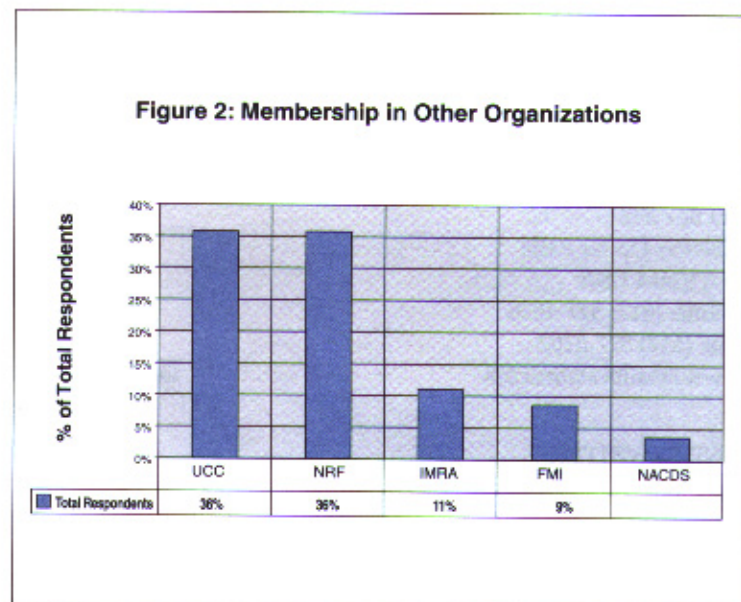
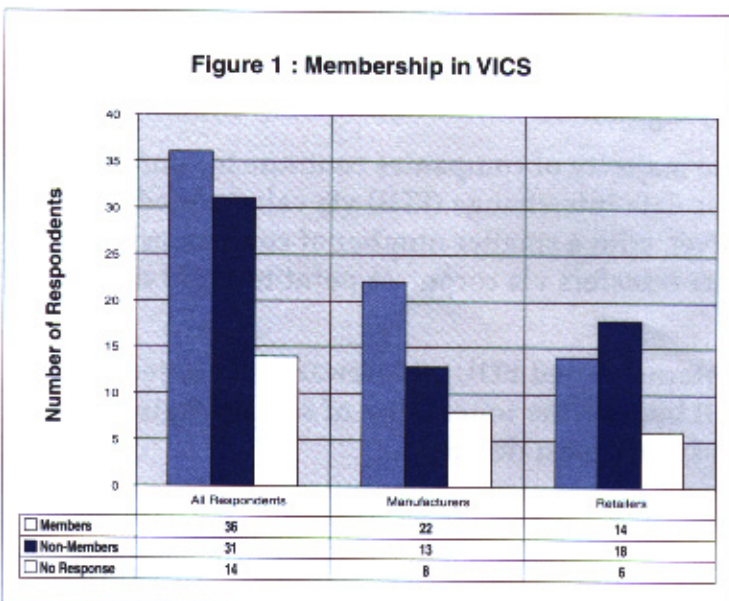


TABLE OF CONTENTS

Methodology	2	Section IV: Inter-enterprise Communications Trends	17
Figure 1. Membership in VICS	2	Figure 6A. Inter-enterprise Communications Approach	18
Figure 2. Membership in Other Organizations	2	Figure 6B. Manufacturer vs. Retailer Inter-enterprise Communications Approach	18
Introduction	4	Figure 6C. VICS Member vs. Non-member Inter-enterprise Communications Approach	19
Section I: Inter-enterprise Packaged Software Trends	5	Figures 7 A, B, C. Volume of Inter-enterprise Communications	20
Figure 3A. Overall Perspective	6	Section V: EDI Trends	21
Figure 3B. Manufacturer vs. Retailer Package Utilization	6	Figures 8 A, B, C. EDI Transport Method Usage	22
Figure 3C. VICS Member vs. Non-member Package Utilization	7	Figures 9 A, B, C. EDI Volume by Method	23
Section II: Average Application Age	9	Figures 10 A, B, C. EDI Implementation	24
Figure 4A. Average Application Age by Origin of System as of June 1998	10	Section VI: Supply Chain Trends	25
Figure 4B. Manufacturer vs. Retailer Average Application Age as of June 1998	10	Figures 11 A, B, C. Supply Chain Practice Implementation	26
Figure 4C. VICS Member vs. Non-member Average Application Age as of June 1998	11	Section VII: Future Trends	27
Section III: Planned Application Replacement	13	Figures 12 A, B, C. Future Technology Implementation	28
Figure 5A. Planned Application Replacement before Y2K	14	Section VIII: Priority Trends	29
Figure 5B. Manufacturer vs. Retailer Planned Application Replacement before Y2K	14	Figures 13 A, B, C. Top Priorities	30
Figure 5C. VICS Member vs. Non-member Planned Application Replacement before Y2K	15	Summary	31
		Appendix	33

In recent years, the retail industry has seen the initiation of a number of inter-enterprise practices. These include category management (CM), vendor-managed inventory (VMI), and collaborative planning, forecasting and replenishment (CPFR). As a result, the inherent conflict between demand-driven retail processes and supply-driven manufacturing processes has become a popular topic throughout the retail industry.

A resolution to this conflict should therefore begin with an examination of supply chain processes and communications methods currently in use. By examining the current and possible future inter-enterprise processes and systems environment, retailers and manufacturers will be able to benchmark current supply chain enablers. This, in turn, will increase the ability of supply chain partners to enhance the efficiency and effectiveness of their supply chains, as well as determine requirements for the development of future enablers. These enablers will include new technology, process collaboration initiatives, common metrics, and communications enhancements.

Ending the conflict between retail and manufacturing processes in this way becomes even more crucial when considered in the light of the continued consolidation of firms, both retail and manufacturing, as well as other supply chain partners, such as transportation carriers, in this decade. Other mitigating factors include globalization and deployment of retail enterprise systems and cooperative retail-manufacturing initiatives. These circumstances have created an environment of growing interdependency between supply chain partners and competitors.

Thus, by putting retailers and manufacturers into an unfamiliar cooperative situation, the changing supply chain environment is transforming traditional roles and core process definitions. To successfully adapt to the modern supply chain, retailers and manufacturers must enhance two conflicting but necessary, requisite dynamics:

- Supply chain effectiveness. This has become directly linked to customer value in the short term. Stockholder value and change of marketshare are the long-term external indicators of effectiveness.
- Supply chain efficiency. This has become directly linked to cost reduction, cycle time, and redundancy throughout the supply chain. Financial viability and corporate growth are long-term indicators of efficiency.

In order to assist retailers and manufacturers in their critical efforts at improving supply chain collaboration, this study provides analysis revealing the state of the retail industry supply chain in the late 90's. Further analysis, based on indications from the current state of the supply chain, reveals likely future supply chain trends. Future trends covered include the planned role for newer Web-based between-ware technologies (protocol-independent software that supports and organizes data in a standardized format), from object technology to messaging middleware. Other trends include top systems and process priorities such as Y2K, internal systems integration, and trading partner integration.

SECTION I:

INTER-ENTERPRISE
PACKAGED
SOFTWARE TRENDS

**Supply Chain
Study**

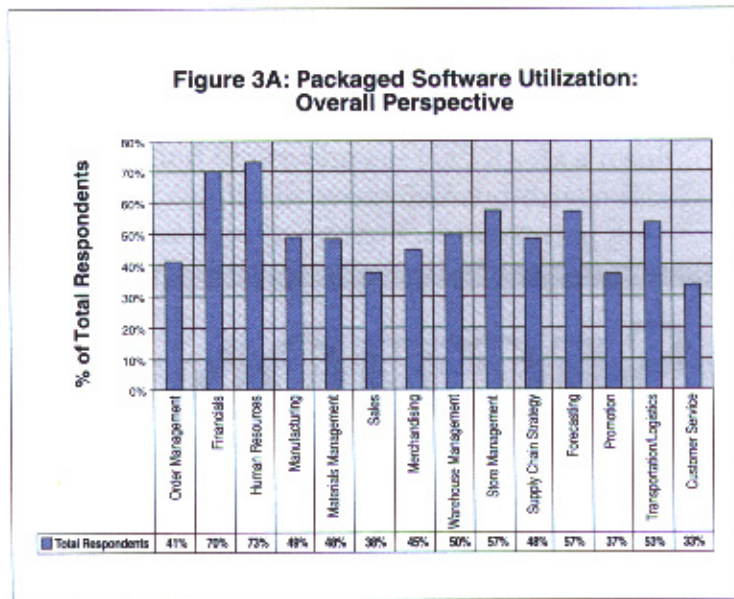


Figure 3A. Overall Perspective

This figure illustrates that packaged software usage is highest among supply chain partners in general business applications, such as human resources management and financial management.

It also shows that lowest usage of packaged software centers on dedicated retail and manufacturing processes such as sales, promotion, and customer service.

This reflects the state of packaged software today. However, historic patterns of package usage are changing due to growing collaboration between retailers and manufacturers. Implementation of supply chain applications that previously held less value as stand-alone systems or point solutions will increase as retailers initiate collaborative programs with suppliers.

Examples of how cooperative practices are changing the integration landscape include promotional management systems. Supply chain partners will soon jointly access these systems, which support internal marketing and advertising functions. This access will enable increased productivity, preparation, cooperative advertisement controls, reporting, budgeting, and media production planning. Another example includes evolving applications that will synchronize customer relationship management, promotional management, and buying and distribution processes.

These new practices will grow into industry standards as the pressure for a more cost-effective and speedier supply chain increases and it becomes even more important to have packaged systems that work for both retailers and suppliers. In addition, it is likely that packaged solution trends will see significant growth in transportation, customer service, warehouse management, and other areas critical to the enabling of cooperation and visibility of product flow.

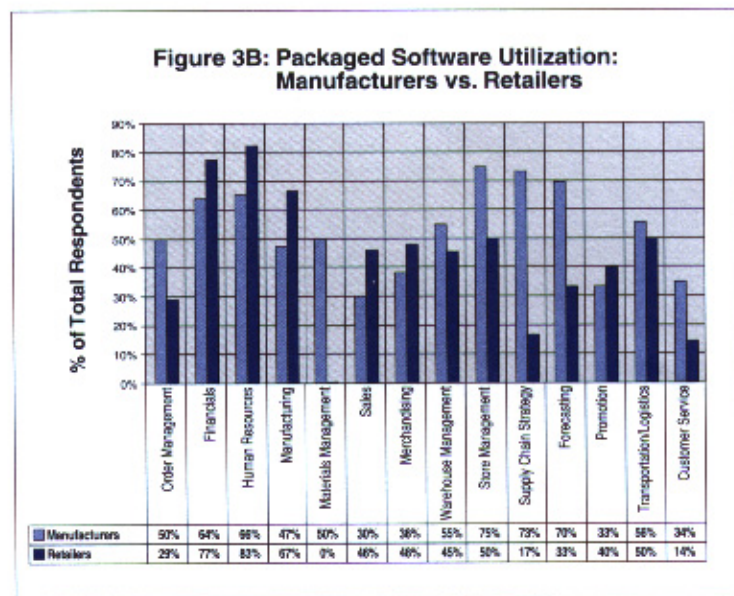


Figure 3B. Manufacturer vs. Retailer Package Utilization

This figure compares the different levels of utilization of 14 separate packaged software categories shared by retailers and manufacturers.

It indicates that the highest use of general business applications by retailers is in financials and human resources. This reflects the maturity and universal applicability of these functions to all business types. There is significantly less use of packages for application areas, however, that differentiate business operations and practices. Manufacturers' use of packaged applications concentrates on supply chain optimization strategy and forecasting. This reflects a priority for deciding strategic issues first. Supply chain software provides a natural dynamic extension to an ERP implementation. As the supply chain process has matured, forecasting software and algorithms have been added to supply chain systems.

The greatest difference in package utilization between retailers and manufacturers exists in the area of supply chain strategy. As collaborative initiatives between retailers and manufacturers, such as collaborative planning, forecasting, and replenishment (CPFR),

develop, retailer use of supply chain strategy packages will likely increase due to heightened interactivity and the development of between-ware open systems.

The closest level of package utilization between retailers and manufacturers exists in the boundary-spanning area of transportation/logistics. Carriers have been creating separate logistics divisions to provide systems and professional services to meet the logistics needs of their customers and compete on a full-service basis. This trend will further drive the retailer/manufacturer convergence in the transportation/logistics area.

Figure 3C. VICS Member vs. Non-member Package Utilization

This figure shows the software package utilization among VICS members as compared to non-members.

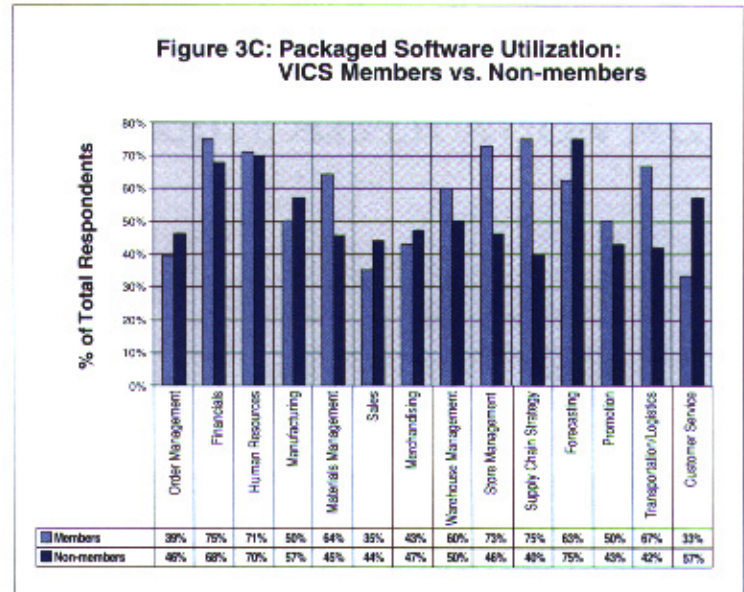
It demonstrates that both VICS members and non-members have a relatively high usage rate of packaged point solutions in financials and human resources. As demonstrated in Figure 3B, the universal applicability of these functions leads to the use of packaged applications.

VICS members have high levels of packaged application usage in the area of supply chain strategy, due to the number of manufacturers participating in VICS programs. This is also true for the area of store management, due to the number of vertical manufacturers with retail outlets.

Non-members have a high level of packaged application adoption in the area of forecasting. This is mainly due to the level of sophistication required to bring complex statistical algorithms to a simple user interface, which is beyond the technical expertise of many non-VICS respondents, who tend to be newer companies. It is also a clear case where having a homegrown application could be a strong limiting factor in maintaining functional standards.

VICS members least frequently use packaged applications in the areas of order management, sales, and customer service. These are all basic core functions that were among the first automated by VICS members. Because VICS standards were developed for electronic data interchange (EDI) to fit the divergent systems of its members, homegrown VICS member applications were adapted to the then new VICS EDI standards before packaged solutions were widely available.

Non-members least frequently use packaged applications in the areas of sales, promotion, transportation/logistics, and supply chain strategy. This reflects the requirement of most companies to develop specialized integrated systems to support unique aspects of the business. In the area of transportation/logistics, the low frequency is part of a growing trend among retailers and suppliers to outsource these functions to third party logistics companies.



Retailers and suppliers will enter the next millennium with less than ideal inter-enterprise systems capabilities. This common situation at many major companies results from decisions about internal systems methodology and approaches dating back more than a decade ago. These decisions focused on internal corporate process improvement, as opposed to today's collaborative supply chain direction. Thus, while retailers and suppliers successfully upgraded their systems' abilities, they failed to take into consideration systems developments among their partners.

As a result, study respondents, including leading members of VICS, have begun or will soon begin investigating how to reengineer their companies and systems to create more effective supply chains. This reengineering process involves the examination of methods for integrating packaged applications and standardized Web-based communications infrastructure with partners. Several conditions in the supply chain arena will have a major impact on the direction of systems integration among supply chain partners.

One of these conditions, application age, which has impacted the flexibility required to adjust systems to new inter-company business scenarios, will affect the potential relevance of enabling technologies to supply chain integration. Because these applications use dated development languages, platform-dependent operating systems, and proprietary hardware infrastructures, they require substantial investment in interface development and other required updates. Moreover, as companies continue their investments in aging applications through Y2K remediation and other maintenance, they create a strong internal inertia to maintain the existing infrastructure.

Also impacting supply chain integration is the primary emphasis retailers set on replacing applications for forecasting and transportation/logistics before Year 2000. The urgency of retailers to replace forecasting and transportation/logistics applications reflects their focus on predicting demand for merchandise, then moving it to the shelves as efficiently as possible.

As opposed to retailers, manufacturers set the most emphasis on replacing applications for warehouse management. This trend reflects the required im-

provement in replenishment loop time with carriers and retailers. The time and accuracy involved in order processing and physical distribution results from the mission-critical role that warehouse management plays in an efficient supply chain. Efficiency initiatives such as cross-docking, pre-ticketing, advance ship notices (ASNs), and automated replenishment increase the workload requirements on the shipping warehouse. Smoothly functioning warehouse management applications have become crucial to keeping manufacturers on track in the supply chain and synchronized with their partners.

Further affecting the direction of supply chain integration is the continuing prevalence of fax and paper as inter-enterprise communications devices. Fax and paper usage remains high, even in firms that use EDI. The use of real-time EDI, Web forms, Web EDI, and extranets fails to eliminate paper-based communication. The persistence of paper is generally due to the drawbacks of EDI to handle real-time informal interaction, for which no standards exist.

Therefore, despite the strong presence of batch EDI, paper and fax still represent a significant percentage of inter-enterprise communications volume.

Another condition affecting supply chain integration is the widespread acceptance of newer best practices in inventory management. These practices, such as algorithmic inventory modeling and collaborative planning, are off to a strong start when compared to more established initiatives such as category management. The increasing overall implementation level of store/SKU forecasting results from strong acceptance of these new practices.

One final condition likely to have a large future impact on supply chain integration, in spite of the limitations placed by application age, is Internet-based EDI. While the study illustrates that security concerns have minimized the volume of EDI transactions over the Internet, it also shows that a noticeable number of respondents in every category have tested Internet-based EDI capability. The higher percentage of Internet-based EDI implementation by retailers, as opposed to manufacturers, reflects the larger number of suppliers with whom retailers must connect.

This study sampled a total of 66 respondents, 28 of whom were VICS members. Following is an alphabetized list of all respondents, divided by retailer and manufacturer. Current and past VICS members are noted with an asterisk (*).

Retailers

Belk Inc.*
 Blue Star Consumer Retailing Ltd.
 The Bonton Department Stores Inc.*
 Boscov's Department Stores*
 Bradlees
 Bunnings
 Catalogo Electronico Productos
 Catherines Stores Corp.
 Cato Corp.
 Comark, Inc.
 Deportes Marti
 Fingerhut*
 Garden Ridge, Inc.
 Goody's Family Clothing
 The Gymboree Corporation*
 Heilig-Meyers Company
 Helzberg Diamonds, Inc.
 Hi-Lo Food Stores
 Lids Corporation
 London Drugs Ltd.
 Marks & Spencer*
 The MarMaxx Group*
 Meijer Inc.*
 Mountain Equipment Co-op
 The North West Company
 Phillips Van Heusen* (retail division)
 Pick 'n Pay
 Quality Stores, Inc.
 S&K Famous Brands, Inc.*
 Service Merchandise
 Wal-Mart*
 Wegmans Food Markets*

Manufacturers

Bayer Consumer Care
 Cayset Fashions
 Coca-Cola Enterprises

Corning Consumer Products Co.*
 Durand International
 Eastman Kodak
 Epson America, Inc.
 Esprit de Corp*
 Exterior Wood
 Fieldcrest Cannon*
 Gillette*
 Lancome*
 Lexmark
 Liz Claiborne Inc.
 Louisville Bedding Co.*
 Meyer Corporation*
 Nike*
 Pacific World Corp.*
 Pendleton Woolen Mills*
 Philips Consumer Communications
 Philips Consumer Electronics
 Phillips Van Heusen (manufacturing division)*
 Plainwell Tissue*
 Prestone Products Corporation*
 Regal Ware
 Sara Lee Knit Products*
 Sauder Woodworking Co.
 The Pfaltzgraff Co.
 The William Carter Company*
 Toastmaster, Inc.*
 US Steel - Fairfield Works*

Other

Note: The following three corporations were included in the study as unclassified entities. They were used in tabulations of responses to general questions, but not in tabulations of responses to questions that specified the respondents as retailers or manufacturers.


Defense Logistics Agency
 MGC America, Inc.
 Plymouth, Inc.

PUBLISHER:

Retail Systems Alert Group 

Retail Systems Alert Group is the leading provider of integrated information services for the retail systems industry. Retail Systems Alert Group provides analysis and insight about a broad spectrum of retail systems and supply chain issues through publications, conferences and expositions, Internet services, special reports, and customized research. Retail Systems Alert Group can be reached at PO Box 332, 77 Oak Street, Suite 201, Newton Upper Falls, MA 02464 (617) 527-4626; www.retailsystems.com.

LEAD ANALYSTS:


Ram Viswanathan, Ernst & Young LLP 

Ram Viswanathan is a senior manager in the consulting practice of Ernst & Young LLP, a global professional services firm. He specializes in e-commerce and supply chain management. Mr. Viswanathan has more than 12 years of experience in the definition and implementation of EDI/EC strategies across various industries. Ernst & Young LLP can be reached at 787 Seventh Avenue, New York, New York 10019 (212) 773-3000; www.ey.com.

Mohsen Moazami, Kurt Salmon Associates 

Mohsen Moazami is a vice president in Kurt Salmon Associates, a global management consulting firm. He is director of global e-commerce. Mr. Moazami has many years of experience in various aspects of IT, including systems design and enterprise resource planning software and implementation. Kurt Salmon Associates can be reached at 1355 Peachtree Street Northeast, Atlanta, GA 30309 (404) 892-0321; www.kurtsalmon.com.

UNDERWRITER:

QRS, Inc. 

QRS, Inc., based in Richmond, CA, offers the total demand chain solution, providing Electronic Commerce Enabling into the next millennium. In 1998, QRS sustained its leadership position in the delivery of network-centric inter-enterprise Electronic Commerce solutions that materially improve customers' performance. Forbes Magazine named QRS as one of the '200 Best Small Companies in America' for the second year in a row. QRS, Inc. can be reached at 1400 Marina Way South; Richmond, CA 94804 (510) 215-5000; www.qrs.com.