

# eCollaboration Standards Opportunities

**BENEFITING FROM THE EAN.UCC SYSTEM**



A Standards in Action White Paper

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## **PROGRAM OVERVIEW**

With increased emphasis on supply chain efficiencies and economics, retailers in all sectors and their suppliers are under pressure to find new ways to collaborate without significant investments in hardware, software, implementation or training.

Begun in April 2002, the Standards in Action Program seeks to promote the adoption of legacy and newly established EAN\*UCC physical and digital commerce standards and practices. For example, the program will encourage interoperability across the supply chain, master data synchronization, uniform data and process definitions, neutral data guidelines, and common industry linkages between transaction and master data.

The program will provide retailers and suppliers with a "marketplace" to explore, understand and shop for appropriate EAN\*UCC commerce standards and industry-certified interoperable software.

## **WRITTEN BY RETAIL SYSTEMS ALERT ADVISORY SERVICE**

MoonWatch Media's Retail Systems Alert<sup>SM</sup> Advisory Service has provided research and product updates for the retail and supply chain industries for more than 15 years through Retail Systems Alert<sup>®</sup> research report, and its Supply Chain Alert<sup>SM</sup> research report, and surveys, studies, and customized research. In November 2002, Retail Systems Alert Advisory Service combined Retail Systems Alert and Supply Chain Alert as part of a single online subscription service. This comprehensive online service is the premier source of unbiased researched information and analysis on systems, business processes, and supply chain practices.

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## **SUPPORTED BY NATHAN RESEARCH INC.**

Retail Systems Alert Advisory Service collaborated with Nathan Research Inc. in the development of benefit calculator referenced in this paper. Nathan Research Inc. is a strategic consulting firm made up of a seasoned team of Industry, Process and Technology specialists with several years experience in Retail/CPG, Management Consulting and Software. The mission for Nathan Research is to combine research, experience and thought leadership, translating strategic direction into tactical and operational plans to provide immediate and sustainable value to CPG and Retail companies.

## **INTRODUCTION: RETAILERS/SUPPLIERS ARE BOARDING THE STANDARDS TRAIN**

When it comes to supply chain management automation, end-to-end supply chain visibility and supplier-retailer collaboration, many initiatives have foundered due to a lack of a single set of industry standards or a basic lack of understanding of the value of standards.

Similarly, the retail industry has been extensively educated to the benefits of collaboration, whether in the form of collaborative planning, forecasting, and replenishment (CPFR®) or in more generalized e-collaboration. But again progress in collaboration is hindered by the lack of standards.

This era, however, is passing with the industry's acceptance of the need to collaborate and the arrival of a long-awaited set of industry-endorsed standards. EAN International and the Uniform Code Council, Inc. (UCC) have jointly introduced a set of actionable supply chain standards and an infrastructure and processes to support, maintain, and evolve them. These standards will allow retailers and suppliers to effectively pursue sophisticated collaboration and supply chain management strategies.

Leading retailers and suppliers have initiated pilot programs based on these standards and are already reaping benefits. Target Corp., Wal-Mart Stores, Inc., The Home Depot, Inc., Metro AG, Royal Ahold, Lowe's Companies, Inc., SuperValu, Inc., Shaw's Supermarkets, Inc., and others have embraced to implement global supply chain standards.

Wal-Mart, for example, currently handles item synchronization based on the EAN.UCC Global Trade Identification Number (GTIN) and Global Location Number (GLN) standard through UCCnet, a registration and synchronization service, with 40 suppliers, up from eight just a few months ago. By January 2004, the company expects to have almost all its suppliers participating. Even this modest base level of standardization will greatly reduce labor spent on tracking, disseminating, and managing the latest item information, according to a Wal-Mart executive. It will also significantly speed up the process of changing information and introducing new items.

Other retailers-including SuperValu, Sears, Roebuck and Co., Royal Ahold, Target Corp. and Food Lion-also report significant pay-backs from initial implementations of standards-based data synchronization and CPFR. Still others have begun to cash in on scan-based trading and Reduced Space Symbology (RSS) standards. The first pilot projects involving radio frequency identification (RFID) at the case, carton, and pallet levels have provided demonstrable proof that the concept works.

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This paper is intended for retail and supply chain executives. It will summarize supply chain standards and discuss the convergence of a variety of standards efforts under the EAN.UCC System umbrella. It will also describe how standards affect the retail-supplier process and identify the business benefits. Most importantly, it will identify and review the lessons learned from the early implementation efforts. In the process, it will present practical recommendations for implementing and transitioning to a standards-based supply chain process.

## EVOLVING GLOBAL STANDARDS AND THEIR IMPACT

Contrary to popular belief, there never was a lack of standards. The old joke—the nice thing about standards is that there are so many to choose from—is as true of the retail supply chain as it is of anything else. In fact, the industry's problem isn't a lack of standards. It's having too many standards - or standards that are incomplete or problematic or inconsistent - all of which limit the usefulness and applicability of any given standard.

EAN and UCC have addressed that problem by defining a business-centric set of global retail supply chain standards and establishing a permanent mechanism to maintain, enhance, and extend them globally. That effort ensures that the current EAN.UCC standards will continue to apply well into the future, even as the industry evolves and changes. The approach promoted by EAN and UCC also provides a complete set of standards to accomplish fundamental supply chain tasks. At the same time, the EAN.UCC standards process allows the industry to build upon these standards to expand the range of retail supply chain data and processes they address.

The EAN.UCC System is an integrated suite of standards that address common data standards, such as unique identifying numbers or keys and physical data carriers like bar codes; registration and synchronization services, such as UCCnet, to ensure accurate, consistent information worldwide; and EDI/XML collaborative transaction management technologies to support order to pay processes. [See sidebar: The EAN.UCC System of Standards for e-Collaboration.] Retail Systems Alert<sup>SM</sup> Advisory Service, author of this paper, further classifies the standards addressed by the EAN.UCC System into four components, which we label Keys, Physical, Information, and Process.

In the following table, each classification or category is described along with brief examples of early implementations of EAN.UCC standards. Additional implementations are described later in this paper.

Category	Description	Implementation
Keys	Keys are global core standards for identifying items, locations, assets, and relationships. The keys are the Global Trade Item Number (GTIN) and the Global Location Number (GLN). As the label "keys" implies, the GTIN and the GLN provide the foundation for everything else in the retail supply chain. The GTIN is a single, unique number assigned to all products and services, ensuring that they can be easily and accurately identified by anyone in any country or region. The GLN provides businesses with a globally accepted method of identifying legal entities and locations, such as plants, offices, stores, and other shipping or receiving points.	Ace Hardware Corp. (5,100 cooperative stores) updated and expanded its databases, systems and applications to accept data structures up to 14 digits in length, thus ensuring compliance with UCC's 2005 Sunrise date. This change allows the company to scan imported products marked with EAN-13 symbols without disrupting normal business, and multiple inventories as well providing complete item identification with any EAN/UCC data carrier. It also enables the company to participate in UCCnet data synchronization, reduced space symbology and other enabling technologies at any future point. 2005 compliant data processing will serve as prelude to full GTIN compliant practices.

Category	Description	Implementation
<b>Physical</b>	<p>Physical standards define the mechanism, format, and structure for carrying and communicating product information. Specifically, they refer to:</p> <ul style="list-style-type: none"> <li>• Bar codes as conventional item identifiers.</li> <li>• UCC/EAN-128 for identifying items during transit.</li> <li>• Reduced Space Symbology (RSS) for items requiring small labels.</li> <li>• Composite-2D for supplemental information.</li> <li>• RFID for item information transmitted via radio frequency.</li> </ul>	<p>In one of the first tests of RFID, the Sam's Club store in Tulsa, Oklahoma, is testing RFID in a three-phase test. First, RFID tags were placed on pallets carrying Procter &amp; Gamble Co. paper towels delivered to the Sam's Club loading dock. There, RFID readers successfully scanned the tags. In the second phase, RFID tags were placed on individual cases. In the third phase, tags will be put on individual items. To date, the tests have validated the technology. Early adapters will begin rollouts based on accruing benefits and lessons from early pilots.</p>
<b>Information</b>	<p>These standards define the structure and format of supply chain data. Specifically, this category addresses EDI and XML.</p>	<p>Wal-Mart has directed its 10,000 smaller and mid-sized suppliers to begin using Internet-based electronic data interchange applicability statement 2 (EDIINT AS2). EDIINT eliminates many costs associated with traditional EDI while improving the timeliness and usefulness of shared data.</p>
<b>Process</b>	<p>These standards specify advanced supply chain business processes, including collaborative planning, forecasting, and replenishment (CPFR), direct store delivery, and scan-based trading. CPFR simplifies business negotiations for value chain partners and reduces variance in supply and demand through collaboration. Direct store delivery/Vendor Managed Inventory enables automated store replenishment and shelf management. Scan-based trading synchronizes items, prices, authorizations and promotion allowances from scanned bar codes and eliminates invoice discrepancies.</p>	<p>Sears Roebuck and Co. and tire supplier Michelin North America Inc developed a CPFR process around the GlobalNetExchange systems, which is credited with decreasing supply chain surprises, reducing inventory levels, and generating high fill rates. It has also enabled more proactive decision-making. Sears intends to pursue CPFR with other strategic suppliers.</p>

The emergence of these standards has significant implications for retailers and suppliers. Among them:

- EAN.UCC standards are enabling retailers and suppliers to experience tangible, bottom-line benefits today.
- It is time to start implementing standards. The days of wait-and-see are over. The standards are here, they work, and they deliver significant benefits.
- GTIN and GLN, along with UCCnet's automated data synchronization, provide the foundation for achieving both immediate and long-term payback.
- The days of retailer-supplier antagonism are over. The biggest benefits result from cooperation and collaboration.

Standards can be applied throughout the entire retail supply chain, on both the retailer and supplier side. Of these standards, those that impact how information is tracked and transferred are among the most important topics today.

RFID is the latest technology for communicating supply chain information, particularly about the content of case, carton and pallets, as well as actual items. EAN.UCC standards can be applied to RFID. With RFID, managers can follow items through the supply chain and identify hundreds per second even without direct line-of-sight contact. In the process, the technology eliminates the bar-coding problem of line of sight, extends the use of the Internet and addresses the serialization of products.

The benefits: reduced out-of-stocks, reduced inventories, fewer mistakes, and reduced costs through increased automation. As EPC (Electronic Product Code) is transferred from research to commercialization, EAN and UCC will provide standards and solutions to protect legacy investments such as implementation of GTIN. RFID shows great promise in early pilot implementations to streamline the retail supply chain, but the technology still must overcome a number of hurdles before it can be widely adopted.

The EAN.UCC standards touch almost every aspect of the retail-supplier value chain, central to both retailers' management of their supplier relationships and suppliers' management of demand. Of course, not all tasks and processes involve standards. However, the primary processes typically involve standards from one or more categories. For example:

- Demand and relationship management require information standards (EDI, EDIINT, XML).
- Purchase order management and demand-side order management take advantage of keys such as GTIN and GLN, as well as information and process standards.
- Deal management, forecasting, logistics management, and CPFR also require GTIN and GLN, as well as information and process standards.
- Warehouse management/receiving, direct store distribution/receiving, transportation management, and the store itself involve the full EAN.UCC standards system, drawing on each category of standards-keys, physical, information, and process. Eventually, RFID will offer further enhancements.

As they implement these standards, retailers and suppliers will be able to streamline their own internal supply chain operations. They will also be positioned to capture the benefits of increasingly sophisticated, automated collaborative activities in supply chain management and sales and promotion planning, as well as in collaborative insight and product development, in which retailers and suppliers together identify and create the products customers truly want.

Although not difficult, transitioning to the new standards requires planning. Retailers can start by:

- Preparing their organizations for change.
- Rethinking their supply chain processes in light of standards-based automation.
- Identifying experienced partners.
- Joining in pilot projects.
- Starting with the basics (GTIN, GLN, SSCC).
- Allowing for flexibility and change.
- Building and expanding gradually.

## **REAL-WORLD RETAILER/SUPPLIER EXPERIENCES**

A number of leading retailers and suppliers are already implementing various standards and technologies. Many tests are private. The following summarizes a sampling of the tests and pilot projects that have been made public:

### **WAL-MART STORES, INC.**

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- Project: Procter & Gamble Co. pilot.
- Description: Test of GTIN data synchronization through UCCnet in the diaper category.
- Status: Initial pilot project complete.
- Result: Before the pilot project, 98% of the data was in error. After data synchronization, data was 100% accurate. In addition, item maintenance time was reduced from 15-30 days to one day, and market share in a new item's early weeks improved from 5% to 15%.
- Future: Currently in production with more than 40 suppliers through UCCnet. Company expects to synchronize item data with most suppliers via UCCnet by January 2004.

### **METRO AG**

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- Project: Store of the Future
- Description: German retailer Metro, enterprise systems vendor SAP and semiconductor manufacturer Intel led the roll out of a new technology laboratory in an EXTRA supermarket to simulate how integration of emerging standards and advanced technology could improve customer service and experience.
- Status: Metro AG held its grand opening of the Future Store on April 28, 2003. The supermarket store, with its extensive use of RFID, such as electronic product codes, (EPC), at the case and item level provide a glimpse of how EPCs could become essential to supply chain and customer-facing activities.
- Results: EPC was proven to work at the case, carton, and pallet levels and financial feasibility studies are encouraging. Evidence to date suggests technology and standards will enable the retailer to improve the entire value chain, particularly in logistics.
- Future: Metro will use the store to educate its employees about the potential of new systems, pilot technologies for its customers, and test merits of new research concepts.

### **SUPERVALU**

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- Project: EDIINT pilot.
- Description: Effort to shift EDI to the Internet via EDIINT.
- Status: More than 20 EDI documents mapped to XML for EDIINT.
- Results: Company is able to get items onto the shelf faster. Item changes and status changes are communicated faster. Change also improved data accuracy, streamlined receiving process, provided more accurate invoice reconciliation, and eliminated millions of dollars in value-added network costs.
- Future: The company expects to expand the effort from grocery, frozen foods, and dairy to perishable and private-label products.

### **AHOLD USA**

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- Project: Kraft Foods, Inc./BI-LO, LLC pilot.
- Description: Project to demonstrate how item-data synchronization using GTIN through UCCnet eliminates



problems and speeds item introduction.

- Status: Successfully completed.
- Results: Near real-time data synchronization enabled the retailer to simplify and standardize business processes, reduce data management costs, set up vendors more quickly, introduce new items faster, and eliminate most disputes and deductions. The project also enabled other supply chain management tools and collaborative initiatives.
- Future: The company plans to roll out the effort to all suppliers through UCCnet.

### **DOROTHY LANE MARKETS**

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- Project: Reduced space symbology (RSS) test.
- Description: Test to demonstrate the effectiveness of RSS technology on fresh produce items to replace use of four- and five-digit price lookup (PLU) numbers, which had been a time-consuming and error-prone process.
- Status: Successfully completed.
- Results: The project enabled the company to gain visibility to parts of their business. It will enable point of sale capture of information for perishable products that were previously unmarked at their source, thus improving food traceability. In addition it will speed up checkout while increasing accuracy, upgrade inventory management and replenishment processes, reduce spoilage, improve product identification and pricing, and decrease the need for cashiers to be trained on PLUs.
- Future: The company expects to expand the effort to more products.

### **FOOD LION**

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- Project: Item-data synchronization.
- Description: Effort to use GTIN and UCCnet to synchronize item data with suppliers.
- Status: Currently underway.
- Results: The company expects to reduce errant purchase orders and returned shipments and to decrease logistics systems errors and associated costs throughout the supply chain.
- Future: Roll out as ready

### **SCHNUCK MARKETS, INC.**

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- Project: Price synchronization/scan-based trading pilot program.
- Description: Effort to synchronize pricing, promotions, sales, inventories, invoices, and other data via the Internet through scan-based trading.
- Status: Currently operational.
- Results: Sales growth of 4%, nearly 70% decrease in invoice deductions, time spent resolving item and price discrepancies cut in half.
- Future: Full deployment.

Real-world implementation of new standards-based technologies and processes remains the exception rather than the rule. However, the rapid adoption of UCCnet, which attracted more than 300 suppliers by the end of 2002, and pressure from leading retailers on suppliers to participate in UCCnet-based item synchronization, have recently accelerated the pace of implementation, including in other vertical sectors such as hardlines and do-it-yourself (DIY). Retailers can leverage the lessons emerging from these initial efforts to help ease their own transitions to standards-based collaborative commerce.

These lessons include the following recommendations:

- Work with experienced partners. A growing number of suppliers and vendors, including SAP, Intel, and IBM, have experience with these technologies and standards.
- Clean your item data first. Accurate data is required for item synchronization to deliver its benefits.
- Educate yourself. Understand how the standards (GTIN, GLN, and others) relate to each other and how they apply to the supply chain process
- Start small. Begin with a single supplier or a category and build from there.
- Set specific, measurable goals. Monitor progress toward those goals.
- Be prepared to change existing business processes. Don't bother trying to implement new standards if you are not interested in streamlining (changing) processes and operations.

## **THE BUSINESS PAYBACK**

A review of the early implementations also identifies likely business benefits and sources of business payback. GTIN-based item synchronization, for instance, is frequently cited for its ability to reduce the substantial manual effort involved in ensuring accurate product information, thus eliminating mistakes and speeding the introduction of new products-activities that either cut costs or accelerate revenue. Other benefits include improved product safety, increased customer satisfaction, and improved business agility.

In an independent analysis prepared for the Retail Systems Alert Advisory Service, the greatest benefits result from the common language of global standards, specifically:

- Improved product introduction. For any merchandising and allocation plan to be effective, improvements are needed in the basic process of identifying items and communicating with the retail system about items to be carried in stores. A better alignment of product identifications and their timely, accurate transmission to trading partners – resulting from the use of standards such as GTIN and automated item synchronization such as that provided by UCCnet – increases the productivity of the resources deployed for this process. It also reduces the lead time for introducing these items into the market.
- Improved supplier development. This process involves such activities as factory certification, approved vendor list management, sourcing policies, legal approvals, and more. With the current trend toward alternative sourcing, efficiencies in this area will pay off, particularly in light of the increasing use of real-time sourcing methods, auctions, spot buying and private labeling.
- Improved forecasting. More accurate forecasting continues to be a major area of emphasis both for manufacturers and retailers. With a number of practices defined and field tested, the new standards enable even greater opportunity to boost forecast accuracy. Controlled tests have shown that formal process models such as CPFR and improved alignment between the manufacturers and retailers can impact forecast accuracy positively.

- Improved deal management. Retail sectors, such as grocery, that are heavily driven by deals need this process to be examined for better definition and deal execution. Automated, standards-based item synchronization will provide greater efficiency in this area.

**IN ADDITION, THE INDEPENDENT ANALYSIS IDENTIFIED OTHER LIKELY PAYBACK AREAS, INCLUDING:**

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- Streamlined store operations. Flowing the information through to logistics partners, determining types of events that can cause disturbances in a value chain, and taking appropriate action are all part of supply chain event management. At the store level, a consistent view of product data and other identifiers will facilitate a number of retail processes, including catalog, pricing, merchandising, markdown, and space planning.
- Improved fulfillment execution. The transactions that have achieved the most standardization for fulfillment are purchase orders, invoices, and advanced shipped notices (ASNs). The EAN.UCC message standards carry additional context that is meaningful to trading partners and will expedite fulfillment execution. Adopting these message standards will increase the value that companies have already experienced in their EDI investments.
- Improved payables. Retailers and suppliers should seriously examine improvements made possible by the ability to exchange financial data, payment terms, and similar information. In addition, a major best practice, Evaluated Receipt Settlement (ERS), a mechanism enabling automatic settlement with vendors, remains largely under-adopted, despite significant well-documented value propositions.
- Increased IT efficiency. Improved management of vendor catalogs through standards-based automation can decrease new vendor startup costs and ongoing catalog maintenance. Better efficiency will also increase the accuracy and timeliness of the information and speed up communication of new information and special offers. Additionally, it will reduce the need to continuously modify database schemas and formats.

Retail Systems Alert Advisory Service has developed a benefit calculator in collaboration with Nathan Research Inc. as part of the Standards in Action program. The calculator is part of a benefit analysis framework and contains a detailed methodology for a company to go through and determine the range of benefits that are achievable through involvement in standards initiatives.

In conjunction with the MIT Auto-ID Center, IBM and Accenture have calculated the payback from Auto-ID (RFID) solutions for both a distribution center and a retail chain using a highly simplified hypothetical model. In the distribution center, IBM identifies the following benefits:

- Reduction in labor related to receiving, picking, inventory control and shipping.
- Reduction in claims/returns (including related administrative costs).
- Reduction in shrinkage.
- Reduction in annual inventory-carrying cost.
- One-time reduction in transportation expense.

Based on generalized consumer products value chain for the grocery market, IBM concludes EPC results in substantial benefits at the case level. These include: a 10% reduction in shrinkage, a 10% reduction in labor, a 2-3% reduction in claims and returns, and a 20% reduction in inventory carrying costs, resulting in a \$12.3 million in annual savings. This conclusion was based on a consumer products value chain designed around 8 billion items with an average per price item at \$1.75, produced in 4 manufac-

turing plants, distributed through 10 manufacturing distribution centers and 5 retail distribution centers to 800 stores. As a result of permanently lower inventory, there is an additional one-time reduction in transportation expenses totaling \$7.8 million. The financial reward achieved by adopting Auto-ID at the item level is almost double that of case-level adoption. In addition, IBM notes that retailers stand to reap benefits in the range of \$4 million at the pallet level, \$34 million at the case level, and \$60 million at the item level, including the associated one-time cost reductions.

IBM reaches a similar conclusion when using its hypothetical model for an 800-store retail chain. The immediate value proposition for Auto-ID tagging at the case level is particularly compelling. At the individual store level, total benefit is anticipated to be \$98,000, with a system-wide total benefit estimated at \$78 million. Again, benefits from item-level tagging are significantly above those for case-level tagging, reflecting the much higher impact of item-level tagging on product availability. In fact, an investment in item-level tagging may yield close to twice the expected benefits of case-level tagging due to reducing both labor and out-of-stocks.

Of course, these findings are based on simplified hypothetical models. As reported earlier in this paper, Auto-ID/RFID technology has, so far, undergone only limited testing. Although tests to date have been encouraging, the technology's high cost and other hurdles currently discourage widespread rollout. Industry observers, however, expect costs to fall considerably over the next two years and other hurdles to be overcome.

## IMPACT OF STANDARDS ON THE RETAILER-SUPPLIER PROCESS

EAN.UCC standards impact almost every retailer-supplier process. Effective use of standards streamlines processes and saves money and time or generates revenue. Lack of standards raises costs and hinders operations. The following table looks at a selection of retailer and supplier processes and identifies the applicable standards categories and the processes impacted.

Retailer/Supplier Process	Relevant Category of Standards	Processes Impacted
<b>Purchase order management</b>	Keys, Information, Process	PO confirmations, acknowledgements Price Inventory Reorders Changes/corrections
<b>Warehouse management/receiving</b>	Key, Physical, Information, Process	Advanced ship notice Stock reservation Stock status Order picking Shipment status Receipts Damages Overages/Shorts

<b>CPFR</b>	Keys, Information, Process	Sales activity Inventory status Plans Revisions Allocation Assortment/Store Plan
<b>Logistics/Transportation</b>	Keys, Physical, Information, Process	Traffic routing Transfers Notifications, confirmations Bills of Lading Fulfillment, delivery Returns, reverse logistics Optimization and monitoring
<b>Store operations</b>	Keys, Physical, Information, Process	Checkout Payment, credit, layaway Receiving Stock status Floor merchandising Promotions Shelf labeling
<b>Financial management</b>	Keys, Information, Process	Financial planning Sales receipts Payables Adjustments Transfers Chargebacks, deductions Reconciliation
<b>Enterprise data warehouse</b>	Keys, Information	Price inventory PO master Transfer master Location master Localization/international master POS receipts Product information Customer profiles Inventory/logistics plans Orders
<b>Production</b>	Keys, Physical, Process	Scheduling Material and capacity planning Resource planning Bill of materials

## CAPTURING THE BENEFITS OF STANDARDS

One television ad for a state lottery reminds viewers that they can't win if they don't play (that is, buy a ticket). The same can be said for standards. Even the early implementations, noted above, have delivered valuable payoffs. Unlike a state lottery, however, it doesn't require luck to gain a payback from standards-based supply chain management. It only requires sound planning and execution, something any competent retailer and supplier can accomplish.

The transition to EAN.UCC standards has begun. Retailers and suppliers already are reaping benefits. With leading retailers insisting on their suppliers adopting the same standards, the movement towards standards will only accelerate in the coming year. The sooner organizations transition to standards-based commerce, the sooner individual companies and the industry as a whole will experience the benefits.

Building around AT Kearney's study of trading partner practices for the Food Marketing Institute and the Grocery Manufacturers Association, the EAN.UCC System can be broken down into three major components:

1. Common data standards. Fundamental supply chain building blocks, these standards enable globally unique identification. Examples: unique identifying numbers or keys such as GTIN and physical data carriers such as bar codes today and RFID in the future.
2. Registration and Synchronization. The system serves as a central repository for item (GTIN), trading partner location (GLN), and profile (GPP) information, which is verified for compliance to EAN.UCC standards. It also offers registry services provided by UCCnet to ensure that participating organizations have accurate, consistent, timely information worldwide.
3. Sophisticated collaborative transaction management standards. These standards enable technologies such as EDI and EAN.UCC Business Message Standards (XML) for trading partners participating in advanced electronic commerce and e-collaboration.

## THE EAN.UCC SYSTEM OF STANDARDS FOR E-COLLABORATION

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