

WHITE PAPER.

Radio Frequency Identification: Moving beyond the hype to maximum value.

Radio frequency identification (RFID) is attracting lots of attention lately, but it shouldn't be mistaken for another "flavor of the month" technology. Organizations seeking the highest standards of supply chain, logistical and transportation security, including the U.S. Department of Defense and many commercial airlines, have been using RFID with great success for years. But to successfully meet market and regulatory mandates and drive maximum value from RFID investments, companies must address critical issues around standards and data management and adopt the right approach to piloting and accelerated strategy development.

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RFID: MOVING BEYOND THE HYPE.

A Unisys white paper.

Abstract.

Because of market and regulatory mandates, companies in life sciences, retail, consumer packaged goods and other industries are turning to radio frequency identification (RFID) technology to improve supply chain security, efficiency and visibility. As its name suggests, RFID devices use radio frequencies to automatically communicate electronic product codes or other information automatically over varied distances to compatible readers. Consisting of chips and antennas, RFID tags provide instant verification of any goods or people to which they are attached. As they initiate pilot programs, companies must think big and start smart. This is how they can most efficiently deliver returns on what are likely to be sizable investments. Organizations that rush forward with large-scale pilots and implementations may put themselves at risk of data overload, excessive spending and operational gridlock.

There are many opportunities to generate value with RFID, from reduced transportation costs and increased labor efficiencies to improved inventory and returns management. But only companies that adopt an intelligent, holistic implementation approach are likely to realize these benefits. The key is to prepare the organization for the RFID revolution, by developing a clear strategy that matches RFID investments to bottom-line business benefits and leverages emerging best practices and standards.

The balance of this white paper will examine:

- ▶ which industries are using RFID, and how they're using it;
- ▶ the technological components required to build effective RFID-based networks;
- ▶ the opportunities and risks for companies looking to implement RFID in the near future;
- ▶ a recommended approach for moving forward.

RFID: more than the next big thing.

RFID technology has generated a lot of attention in the press recently, and it's no wonder. The U.S. Food and Drug Administration (FDA) recently announced new anti-counterfeiting guidelines for life sciences firms, which include specific recommendations for attaching RFID tags with electronic product codes (EPCs) on all primary packages moving through the supply chain. The goal is to enable verification of the authenticity of every item in the supply chain, from the point of origin to the point of sale to consumers. In the short term, the FDA is encouraging organizations to start pilots to determine the feasibility of this approach, so that production implementations can be complete by 2007.

While the FDA is focused on goods within U.S. borders, the Transportation Security Administration (TSA), a division of the Department of Homeland Security, is focusing on threats to the international supply chain. Among other programs, the TSA is running the Container Security Initiative to identify high-risk containers, and Operation Safe Commerce, which is intended to enhance import security by piloting safe commerce solutions on commercial shipments from foreign suppliers to U.S. destinations.

Market forces are also aligning behind RFID. The Department of Defense is requiring its suppliers to adopt RFID. Wal-Mart has mandated that its primary suppliers employ RFID technology by the end of 2005, and is already working with 18 pharmaceutical companies to tag controlled substances sold through its in-store pharmacies. Target and Tesco have similar plans. The involvement of the world's leading retailers signals that the use of RFID is not strictly about regulatory compliance. In fact, many Wall Street analysts are looking to the use of RFID as a benchmark for supply chain innovation. According to IDC, companies in all industries spent \$92 million on RFID in 2003, with expected increases to \$1.3 billion by 2008. Frost & Sullivan predicts an even larger increase, to \$11.66 billion, by 2010.

RFID at work.

So who will invest all that money, and how will they use RFID? Pharmaceuticals are using RFID primarily to fight counterfeiting, which has become an increasing threat to their brands and profits. Retailers will employ RFID in a number of ways.

- ▶ Smart shelves will notify personnel when items are running low or out of stock;
- ▶ Tags will be placed on high-value or frequently stolen items to combat shoplifting;
- ▶ Automated readers will enable faster, more efficient self-checkout procedures.

Prada, the famous Italian fashion house, has generated great fanfare in using RFID to enhance the customer experience at its high-end stores. When RFID tags on clothing items are scanned, video clips of the item on the catwalk are shown on in-store monitors. Other data about the item, such as inventory status, is also accessible on touch-screens. RFID-enabled customer cards store preferences, giving staff the ability to customize the sales experience.

On factory floors, manufacturers use RFID to keep track of big-ticket raw materials. For instance, in automotive assembly plants, car frames and axles are tagged, while smaller items like ashtrays and dashboard knobs typically are not.

At large-scale distribution centers, RFID tags can ensure that trailers pull up to the right dock at the right time, and that the right load goes in the right trailer and on the right truck. It can even ensure that each truck has the right driver and leaves through the right gate. By automating checkpoints and reducing the need for human interventions, RFID greatly increases the velocity of loading and shipping processes.

Airlines are looking to RFID to improve both the efficiency and security of their baggage handling processes, as well as increase visibility in their air cargo operations. Rental car companies can monitor the specific locations of cars on huge lots, thereby streamlining check-in procedures and minimizing unnecessary upgrades. Resorts and vacation properties may use RFID-enabled keys to enable staff to quickly identify high-value guests, while hospices and eldercare facilities may use it to keep track of their patients. RFID is increasingly familiar to big-city commuters, especially those whose tolls are collected automatically in E-ZPass lanes.

The applications for RFID are seemingly endless. Any company that can benefit from faster and clearer knowledge of the movement and condition of its assets—including products, raw materials, work-in-process, equipment, employees and customers—should (and likely soon will) consider RFID as an enabling technology.

RFID: Battle-tested technology.



While some pundits and consultants may consider RFID a hot new technology, it has actually been around since World War II, when it was used to distinguish allied and enemy aircraft. More recently, RFID has proven its value in delivering the highest levels of visibility and security on complex supply chains. As an outcome of the First Gulf War, Unisys partnered with the U.S. Department of Defense to create the world's largest RFID network to track enormous amounts of ordnance, medical supplies and blood moving around the world. The network provides inside the box visibility and nodal tracking of equipment and cargo. It is now being used successfully during operations in Afghanistan and the Second Gulf War.

Unisys has served as the prime integrator and provider of managed services for the Department of Defense's in-transit visibility network since 1994. Consisting of RFID, optical scanning and satellite technologies, the network is deployed worldwide, with more than 750 nodes, including airports, seaports and rail terminals. Currently, it tracks and secures approximately 350,000 conveyances and 25,000 containers every day.

The RFID technology architecture.

RFID refers to silicon-based radio frequency identification devices that can communicate EPCs or other information over varied distances to compatible readers. Consisting of chips and antennas, RFID tags provide instant verification that products are what their labels say they are. They can be applied to containers, pallets, cartons or individual product units, as well as people, including employees and customers. Similar to bar codes, EPCs are used to provide mass serialization and unique electronic pedigrees for individual items. These pedigrees are used to track and trace the physical movement of items across the supply chain, the modes of transportation that have been used, and any changes in the condition of products. Unlike bar codes, EPCs and RFID tags can be read automatically at greater distances and without a line of sight. Companies can verify the contents of RFID-tagged containers or pallets faster, more accurately and with fewer interventions, because it's not necessary to open them up, as it would be with barcodes. *See chart for comparison.*

There are two kinds of RFID tags, passive and active. Passive tags are assigned a unique EPC when manufactured and have only the ability to transmit data to associated readers. Active tags contain memory for state management and chip-based intelligence, and can both transmit and receive data, including unique EPCs. Both passive and active RFID tags are capable of responding to a variety of low, high or ultra-high frequencies. Each has unique capabilities in terms of the amount of data it can transmit, as well as footprint and proximity constraints. Today, basic RFID tags sell for between \$0.25 and \$0.50 each, with readers in the \$300-\$500 range, though prices vary depending on functionality and are changing rapidly. In general, the greater the need for security and visibility, the more likely the need for active tags. For instance, military departments will use more active tags, with retail stores choosing passive, though most companies will use a combination of both.

	Barcode	RFID
PROS	<ul style="list-style-type: none">▶ Low cost▶ Widespread utilization▶ Readable by humans	<ul style="list-style-type: none">▶ No line of sight required▶ Can store more data▶ Covert and hard to counterfeit▶ Automated processing▶ Can be read in bulk
CONS	<ul style="list-style-type: none">▶ Line of sight required▶ Limited data storage▶ Manual, one-tag-at-a-time processing▶ Easily damaged (dirt, water, scratches)	<ul style="list-style-type: none">▶ Higher cost (expected to drop)▶ Lack of standards▶ Passive reading dependent on conditions

RFID and barcodes are complementary technologies, though RFID has a number of significant advantages, as shown in this comparison.

A number of complementary miniature or nano-technologies will enhance the use of RFID:

- ▶ **Micro-Sensors:** devices that detect physical phenomena and report on specific conditions, such as temperature, humidity, toxicity, radioactivity, light, gravity, acceleration, pH, etc.;
- ▶ **Micro-Actuators:** devices that act based on computer instructions or information from other sensors to start motors and drives or limit switches;
- ▶ **Dynamic Display Devices:** electronic inks, holograms and other technologies that can be integrated into packaging and be activated with electronic charges or flexible display technology.

These represent a few of the more mature devices on the market. New ideas and tools are being developed on a regular basis, including a growing number of cost-effective devices that can be used to read and collect data from RFID tags.

When RFID tags pass within acceptable proximity, readers gather the product information encoded on tags. Readers can also transmit data. If stationary, readers can be attached to applications through tethered networks or attached through wireless protocols. If mobile, the readers may be attached directly to an application or through satellite communications. Regardless, clear standards are starting to emerge. For instance, efforts are underway to standardize the radio frequency KHz or MHz so that readers can work more ubiquitously with tags. In addition, physical mark-up language (PML), a derivative of XML, and various other device operating systems, context handlers and APIs (application program interfaces) are evolving. Some level of consolidation is being driven by EPCGlobal, which manages a consortium of technology companies, research universities, and ISO organizations. To ensure faster and smoother implementations, standards for RFID devices and readers may be abstracted from existing software components. With standardization will come plug-and-play implementation as new technologies emerge.

Generating value from the “explosion” of data.

Industry analysts have predicted that RFID will produce 30 times more data than companies have today. To ensure that data doesn't overwhelm current systems and is instead used for smarter, better, faster performance, companies should leverage several other critical IT components, including data stores, OLAP applications, business rules engines and distributed services. These components are necessary to build an effective RFID architecture and, ultimately, to integrate with existing enterprise infrastructure.

Data stores are required to house and manage the massive amounts of data that RFID technology will produce. EPC tag stores will contain the tag identification numbers associated with specific items (containers, pallets, cases, individual items, orders, etc.). Online transaction processing (OLTP) data contains the key elements of the electronic pedigree. In particular, it contains the mass serialization and chain-of-custody data that ensure all of a tagged item's movements and modes of transport can be tracked. As it includes data on all levels of physical containment, mass serialization can be thought of as a file explorer for the world of physical items. Chain-of-custody data, including information about condition changes and time in and out of custody, is

“We are standing at the very beginning of the technological modernization of retailing.”

***–Hans-Joachim Korber,
Chairman and CEO,
The Metro Group***

“In the past nine months since we set our milestones, we have seen some tremendous innovation. Things are looking as though they ... will meet our business needs.”

***–Simon Langford,
Manager of RFID Strategy,
Wal-Mart***

required to determine that the normal and expected custody chain has not been impaired in any way. It may also contain chain-of-integrity data related to physical devices, such as container seals, packaging techniques, holograms, etc.

OLAP (online analytic processing) and analytics routines contain specific slices of data from the OLTP stores. When analytics are applied to this data, firms can ensure that they design and apply the right business process automation rules to translate real-time RFID data into meaningful transactional data and events. For instance, workflow and process notifications can alert operations managers that shipments have left distribution centers later than expected or face bad weather en route to their destinations. When companies have this information in time they can re-route deliveries or communicate with their business partners. This is how to prevent small supply chain problems from becoming major bottlenecks.

Distributed services represent another key layer of the RFID-based networks. These software pieces are executed to work with RFID readers or data stores, and sometimes come bundled with various readers as value-added services. RFID configurable reader applications typically run on a centralized basis and provide interfaces with readers and portal or mobile dashboards. These may be used to augment and integrate with ERP, CRM and other enterprise applications, so executives can track key performance indicators across the entire business. This level of integrated visibility gives executives advance notice before minor bottlenecks cause inventory or stocking problems for customers. Enterprise application integration (EAI) is necessary to connect ERP, CRM and other systems with the RFID network, including centralized RFID applications, distributed services and the data stores.

The brains of RFID-enabled networks, business process automation rules and analytics are used to raise alarms and distribute alerts to all the right parties when catastrophic or specified business-related events occur. That's how raw RFID data is converted into actionable intelligence. For instance, if the wrong driver shows up on the wrong truck or at the wrong shipping door, alerts can be delivered via portal or mobile dashboards as well as to enterprise systems. That means appropriate personnel on the loading dock, within the distribution center and at the home office are all aware of—and can act to correct—errors long before they result in lost sales. Foolproofing operations in this manner will help companies gain more control of their supply chain operations and prevent costly and time-consuming inefficiencies.

As costs go down, technology matures, standards progress and partner networks expand, the value of RFID will only increase. The bottom line is that distributed, RFID-based networks will serve as the foundation of tomorrow's smart supply chains and asset optimization programs across the enterprise.

The business opportunities for RFID.

While the challenges of implementing RFID to meet regulatory and business partner requirements are not to be underestimated, there is good news for companies taking a first look at the technology. Firstly, RFID and related track and trace technologies may be attracting lots of recent attention in the press, but it's certainly not a flavor of the month. The U. S. Department of Defense, Transportation Security Administration and other organizations with zero-gap security requirements have successfully used RFID for more than a decade. In other words, it's not necessary to re-invent the wheel. Secondly, RFID and related technologies are subject to Moore's Law, which dictates that the price is either falling by 50 percent every two years or users receive twice the capability for the same price.

Lastly, and perhaps most importantly, there are significant opportunities to generate sustainable performance gains and cost savings for companies that adopt an intelligent, holistic approach to RFID. Those opportunities cut across all dimensions of shareholder value. AMR Research estimates that savings could reach three to five percent of total supply chain costs. Those savings will come in many forms:

- ▶ Reduced inventory costs through optimized asset management;
- ▶ Reduced diversions and deductions;
- ▶ Reduced handling, carrying and distribution costs;
- ▶ Labor efficiencies, including fewer human interventions and better returns management.

Savings from RFID could reach three to five percent of total supply chain costs.
-AMR Research

On the revenue side, sales will increase as channels are optimized and product counterfeiting is reduced. Increased customer insight will enable more personalized service and targeted marketing. Better inventory and asset management will lead to fewer stockouts, greater stock accuracy, increased inventory turns and an improved order-to-cash cycle time. Quality tracking will enable reductions in theft and diversions. Optimized relationships with trading partners and increased supply chain visibility will minimize waste, losses and recalls.

The value proposition of RFID is based on open systems and standards and the establishment of a solid IT foundation that will enable organizations to realize defined benefits from the new data. Though it might be tempting to view RFID as simply a regulatory or "keep Wal-Mart happy" issue, it's critical to build business cases that reflect the value RFID can deliver. Specific operational gains can be quantified in rigorous cost-benefit analyses. EPCglobal has created business case templates and standard value calculations around discrete application areas for RFID, including all areas of the supply chain, as well as asset optimization and employee and customer optimization.

To harvest the potential benefits, it's essential that companies think past the pilot or near-term implementations. Without sound cost-benefit analyses and clear opportunity assessment, the risk of excessive or strategically misdirected investments increases exponentially. But uncertainty has made building business cases quite difficult. The RFID landscape is changing quickly, with plenty more evolution to come, and significant issues and obstacles to RFID success remain.

Risks & threats of RFID.

The high cost of RFID and lack of clear standards are two important concerns, both of which are being mitigated. The cost of RFID technology is falling rapidly, and industry groups are working to develop standards that will address interoperability challenges, but other key issues remain. Data management is one such issue. Industry observers suggest EPCs and other RFID data will increase current stores of enterprise information by a factor of 30. Even companies that avoid drowning in data may struggle to derive value from it. Data can be an asset, provided it is put to work in support of core business goals, rather than locked up in data stores. The application of analytics, business intelligence and process automation tools can help. Because the real value of mass serialization and electronic pedigrees is in the visibility they provide, RFID data must be structured to provide maximum intelligence in the form of triggers and notifications of catastrophic or key business events. And the data must reach dashboard and transactional execution systems quickly enough for executives and electronic systems to act on it. Distributed and collaborative architectures are capable of screening data at the lowest levels—for tracking and tracing—but also for assembling a clearer view of the bigger picture. That means firms can manage operations more nimbly, taking advantage of market trends sooner and preventing small disruptions from becoming major blockages in the supply chain. First, the RFID data must be captured, managed and routed properly. That's no small task. And while failure rates continue to fall rapidly, data quality will remain an issue for the foreseeable future.

“The error rates of reading items are fairly low, but any error rate has the potential to insult the customer, and that's obviously not a good public relations exercise.”

***–John Brand,
Meta Group***

Privacy is still another issue. Consumer advocates and civil libertarians raised alarm bells about the scope of RFID initiatives at Benetton, Tesco and Prada. While some might say these incidents were teacup-sized tempests, all of these firms were forced to spend time explaining their positions in the press. For now, it remains unclear what consumers will and will not accept in terms of data businesses gather and store about their preferences, behaviors and histories. For instance, Prada's customers objected to the company capturing data about the sizes they wore.

Still another challenge is the question of intra-industry cooperation. It's possible that in pharmaceuticals, the need for standardization and broad regulatory compliance may outweigh potential competitive advantage for individual organizations. Pharmas may discover that the best way to manage costs associated with RFID adoption is to emulate the oil industry and cooperate in the establishment and maintenance of key infrastructure.

As if the installation and implementation challenges were not enough, RFID networks will provide additional business continuity challenges, including security, scalability, constant availability and disaster recovery. Further, there are the blue-collar tasks of field service, maintenance and help desk support. The distributed network will be a mix of multiple technologies, applications, devices and platform, and the supporting infrastructure will need to be rock solid. As demonstrated by the U.S. Army and others, it is possible to operate highly effective, stable and scalable RFID networks under even the most demanding conditions. Companies choosing technology and integration partners would do well to seek actual, hands-on experience in designing, deploying and managing RFID networks.

In combination, these issues are causing many businesses to take a wait-and-see stance, or, in some cases, to push back against unnecessarily speedy implementations. Because they have been burned by overhyped technologies in the past, companies are studying the full range of risks and opportunities before committing significant resources to RFID. While no market leaders can afford to fall too far behind the curve, establishing organizational readiness looks like the best first step.

Next steps for RFID success.

Greater supply chain velocity. Fewer human interventions. Enhanced visibility and security. These are the promises of RFID, but how do businesses make sure the potential becomes reality?

For organizations not required by regulators or their market-making partners to adopt RFID in the near term, the first step should be a rigorous assessment of organizational readiness and business opportunities. This process, which need not take more than several weeks, is especially important for firms with little understanding of RFID or where there is uncertainty on the most effective scope of a pilot.

While market and regulatory mandates create urgency, RFID should be managed carefully and iteratively, like other emerging technologies. Strategic planning and requirements definition come first, followed by design, testing and implementation. After implementation, RFID programs should be evaluated against quantifiable, pre-defined metrics tied to core business goals. Based on that evaluation, strategy and requirements may need refining and the cycle begins again. No matter their state of RFID readiness, organizations will need to apply this proven approach for dealing with emerging technologies.

In identifying the best opportunities for pilots and initial implementations, it's important to be selective. Investments must be aligned to support core business goals. Some businesses may determine to test RFID first inside a manufacturing plant, while others may look to large distribution centers or to certain product classes. Areas not currently automated, such as returns and warranty processing, are also good candidates for pilots. The economics likely won't add up to support the tagging of inexpensive items with RFID. High-value products or fast-moving assets will likely make more sense.

Companies that plan strategically are more likely to profit from emerging standards and the new supply chain data RFID will make available. In fact, while integrating RFID networks with other enterprise systems should be a long-term goal, many organizations are keeping RFID data separate until they learn what's required to clean it up, ensure its consistency and design effective processes for handling exceptions and failures. In other words, many organizations have concluded that the near-term risks of hurried, large-scale integrations outweigh the potential gains. By creating stand-alone RFID systems with analytical (interrogation) and middleware tools, organizations can verify the functionality value of their deployments and before moving on to the challenge of integration with legacy and enterprise systems.

A careful planning phase can also ensure that sponsors have time to create buy-in and support for RFID initiatives among operations management personnel, many of whom may feel threatened by RFID. Training may also be necessary. Training and consensus are two factors that have proven critical to the success of RFID implementations in which Unisys has been involved.

Careful planning doesn't mean getting bogged down in long, drawn-out technology evaluations and selection processes. Rather, companies should assess the condition of their own infrastructures, and where RFID will fit in. Again, they can keep an eye on existing pilots and experiments to see which technologies, service providers and protocols demonstrate success in the field and emerge as best in breed. In fact, the clearer the strategy and business case, the greater the organizational readiness and ability to deploy rapidly.

Firms completing strategic value assessments of RFID, should ask:

- ▶ What are the right products or processes with which to pilot RFID usage?
- ▶ Where will competitive advantage come from? Conversely, can collaboration with peers, suppliers and/or competitors provide cost savings?
- ▶ Which tools and/or partners are proving to be best in breed?
- ▶ How do we align with emerging standards around tags, readers and data specifications?
- ▶ Is our existing infrastructure—including supply chain, CRM and ERP systems—in a state of readiness to handle RFID data?
- ▶ What are the advantages of working with managed service providers?

Companies that are ready for piloting should also adopt an accelerated, but no less strategic, approach. In some industries, there are significant learnings and best practices from existing pilots and experiments that can be applied. And because of the urgency to progress quickly toward a scalable solution, the opportunity to start creating value with RFID is closer in some industries—like retail—than in others. Again, it's important that investments are matched to specific operational goals, like increased supply chain velocity reduced theft and diversions. Wherever possible, companies should design pilots that build on stable elements—from both the technology and process perspectives—in their supply chains.

If pilots become blue-sky exercises without targeted metrics and hard timelines, integration with legacy systems can become huge resource drains or the valuable data will have nowhere to go. The potential benefits of RFID are far-reaching, but they must be balanced against costs and risks. And while there can be little doubt that RFID is going to play a significant role in the global supply chain for many years to come, companies that lay the groundwork now will be able to deploy more quickly and intelligently when the time comes for their industry.

How do companies adopting RFID ensure their investments deliver maximum value?

- ▶ **Think Big:** look past the pilot and build comprehensive business cases that link RFID's operational impact to bottom-line financial metrics and measurable performance enhancements.
- ▶ **Start Smart:** in formulating strategies and initiating pilots, focus on capabilities that balance business value, risk mitigation and cultural acceptance, using proven components and best practices from previous pilots.
- ▶ **Deliver Efficiently:** deploy simplified mini-solutions that integrate with existing assets and proven processes to build momentum, demonstrate value and define templates for effective rollouts on a global scale.

Conclusion.

Even companies that aren't required to adopt RFID by regulators or their business partners shouldn't lose sight of the substantial cost and efficiency gains it will enable, and the need to move forward deliberately. While the opportunities are huge—RFID can improve nearly every aspect of supply chain performance—so are the risks for companies that don't leverage best practices, choose the right, standards-based tools or match investments to well-defined operational enhancements. The massive amounts of EPC and electronic pedigree data can be a powerful asset enabling enhanced visibility and improved decision making, or a liability bogging down existing systems and processes. To ensure RFID success, forward-looking firms will think big, start smart and deliver quickly.

Why Unisys?

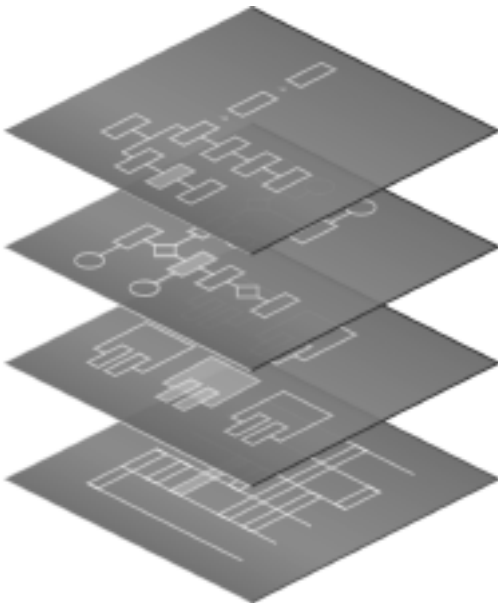
Why should your company turn to Unisys for help in designing, piloting and deploying effective RFID-based networks? Because of our experience in implementing zero-gap security solutions for the Department of Defense, the U.S. Transportation Security Administration and other exacting clients. Specifically, Unisys helped the U.S. Army build and manage the world's largest RFID network, securing more than 25,000 containers per day in more than 50 countries. Currently, we are leading four pilots for the TSA's Operation Safe Commerce, including the largest pilot at the Port of Long Beach/Los Angeles.

We have extensive industry expertise in life sciences, consumer packaged goods and transportation/logistics, and dedicated specialists in supply chain management, customer relationship management, enterprise business systems and emerging technologies. Our Global Infrastructure Services unit works closely with an array of partners, enabling fast, efficient, secure and robust deployment of the latest technologies. Our component-driven architecture provides for optimal flexibility in integrating emerging technologies with legacy and enterprise applications. As a member of EPCGlobal, we are well versed in the business case analysis and value targeting across all elements of the supply chain, CRM and enterprise asset management.

Unisys is the architect of 3D Visible Enterprise, as well as the 3D Blueprinting process that takes you there with industry-transforming results. In a 3D Visible Enterprise, you can see all the interconnections between vision, business operations and IT systems that support them. The key is the alignment of these functions—the way the system works as a whole, once everything is visible, defined, and synchronized. Unisys 3D Visible Enterprise allows you to see the cause-effect relationships before you make costly or ineffective business decisions.

As the architect of 3D Visible Enterprise, Unisys offers a comprehensive vision and more predictability in terms of results. Unisys is collaborative and easy to work with. These are the reasons for our successful, long-standing partnerships with many of the world's leading companies. Today, Unisys is a new company known for global reach, a comprehensive portfolio of end-to-end services, and a clear, consistent focus on cost and operational improvements.

For further information, visit www.unisys.com or call at 1-800-874-8647 x 424.



Because Unisys RFID solutions are based on our proven 3D Blueprinting approach, which includes re-usable code and process templates, they deliver more value than pilot programs, and deliver it faster.

**For further information, visit www.unisys.com
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