



Stop Getting Strangled by your Supply Chain

Enhancing SCM using RFID

Supply chains today are very fragmented. They are only as good as their weakest link. Each of these links is an individualistic entity with different processes. Compounded to this, the Supply Chain Management (SCM) systems being used deal poorly with rapid change. Many implementations of SCM work best during the steady-state demand periods of a product lifecycle, but poorly during its ramp up and down. In such a scenario, product and information flow becomes highly inefficient. Enterprises which are now looking at boundary-less transactions face the challenge of having to deal with data inefficiencies on a global scale.

These inefficiencies lead to problems in demand forecasting. The heuristic approach being currently followed is based on certain models which are fed with the data. Unfortunately, due to the problems along the supply chain, variations in orders tend to get amplified. This turns into a vicious spiral where demand is continuously changing disproportionate to the production, and forecasting keeps trying to catch up with the demand.

Real time data creates an unprecedented level of visibility and leads to better decision making capabilities. Radio Frequency Identification (RFID) technology goes beyond the traditional bar code identification, fortifying visibility with better data granularity and more timely updates. Manufacturers will be able to use the real time data to refine forecasting and replenishment algorithms. Retailers can use real time visibility to squeeze their supply chain to its maximum. The ultimate benefit of use of RFID based supply-chain integration is to find ways of constantly monitoring and improving the whole system by using all the available data. RFID Solutions from TCS can help companies to implement an RFID-based solution for their supply chain needs.

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Introduction

It is estimated that 75 per cent of the cost of a retail product is utilised in getting it there. This cost is the prime driver for organizations to continuously look for methods to cut costs within the supply chain. This chain is now at the forefront of a new technological revolution; a demand-based revolution fostered by solutions based on Radio Frequency Identification (RFID) technology.

“Demand-based management will be the next battleground for competitiveness.”

- Dr. Hau L. Lee, Stanford Global Supply Chain Management Forum

Technology has driven fundamental changes in the way companies manage their businesses. With the addition of sophisticated solutions, such as warehouse management and Enterprise Resource Planning (ERP) systems, as well as wireless networking tools, companies have been squeezing more efficiency out of their operations every day. So far, these technology solutions have always been localized to a process or a location. For example, a warehouse management system for the warehouse area. In order to truly receive the benefits of technology optimization, it is necessary to unite the entire supply chain.

In supply chains, value is added as goods and services flow from the most basic input providers (raw materials manufacturers, for example) to the final consumers. While goods and services largely flow down the chain, information flows in both directions. For example, information about what is demanded at successive stages passes up the chain while information about supply conditions such as availability, pricing, time-to-manufacture, and so on passes down. In this situation, it is necessary to unite the entire supply chain, to look at it from the point of ironing out the inefficiencies along the chain, and not within one particular process. The ultimate prize of supply-chain integration is to find ways of constantly monitoring and improving the whole system by using all the available data.

Radio Frequency Identification (RFID) technology enables real-time visibility and monitoring of the supply chain. RFID-based solutions are poised to help businesses reduce costs, fine-tune inventory management, fortify theft detection, and achieve new velocity and real-time visibility into business processes across an extended supply chain of suppliers, partners, and customers. With the help of TCS RFID Solutions, organizations can understand the technology’s capabilities and limitations. Implementing a solution based on RFID can increase their inventory visibility while streamlining their operations.

Supply chain is dead. Long live the supply chain!

The current supply chain setup is very fragmented. Even with Supply Chain Management (SCM) systems, every link in the chain is an individualistic entity with different processes. These processes are not aligned with any of the adjoining links in the chain. In such a scenario, product and information flow becomes highly inefficient. Data flows between the supplier, distributor and retailer become extremely prone to errors.

With increasing globalization, the supply chains of today are becoming geographically spread out across the globe. Enterprises are looking at boundary-less transactions, where raw materials are sourced from one country, manufacturing is done in another and the finished product is shipped to various countries.

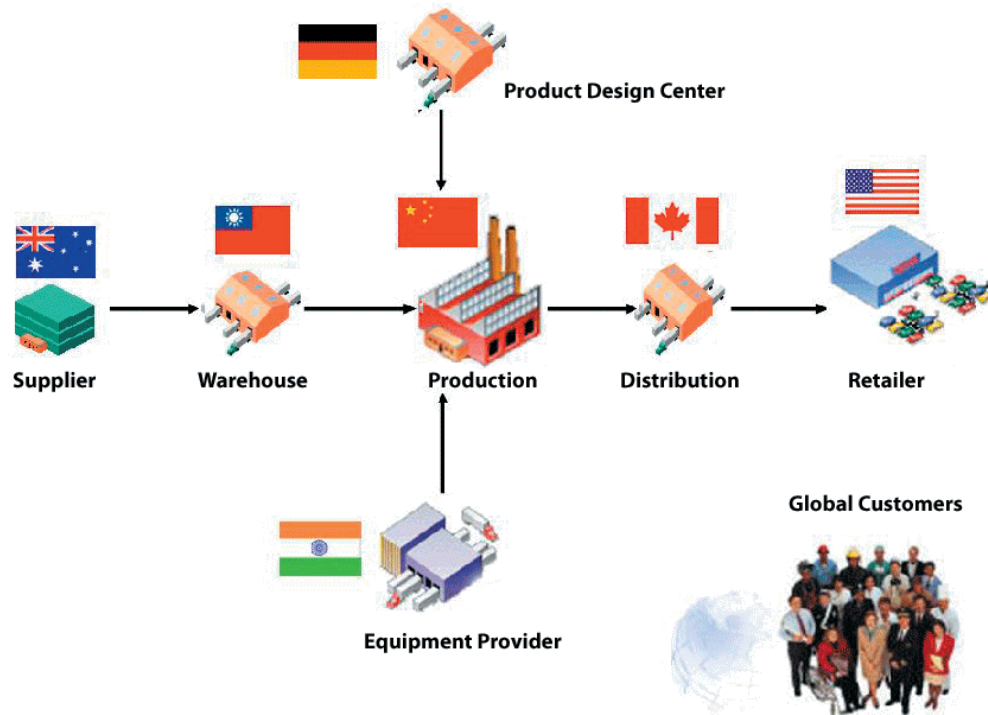


Figure 1: The Global Supply Chain

These global scenarios are further adding to inefficiencies across the supply chain.

The main cause of the inefficiency is the lack of seamless connectivity. Interconnectivity between various links in the chain is incomplete and inaccurate. This leads to poor product visibility and stock transparency across the distribution chain. Another outcome is redundant business processes like multiple data entries of the same data at different premises. A global view on the entire structure leads to a very basic conclusion: *Supply chain partners are not integrated.*

Playing tag with demand

Integration issues are the major cause of inefficiencies faced by companies trying to forecast demand, the holy grail of supply chain management. Presently, from procurement forecasting to demand forecasting to production forecasting, a heuristic approach is being followed. Unfortunately, this approach is characterized by variations in orders tending to get amplified along the supply chain. The reason: each point in the supply chain bases its orders on its own, slightly exaggerated forecast, thus increasingly distorting the information about real consumer demand, often leading to stock outs and excessive inventory. This turns into a vicious spiral where demand is continuously changing disproportionate to the production, and forecasting keeps trying to catch up with the demand.

Global Supply Chain Total Annual Spending	Total Estimated Annual Loss due to Poor Visibility	Annual Cost of Waste
\$3 Trillion	6-10%	\$180-\$300 Billion

AMR Research

For the perishable goods industry, demand management is even more crucial. In the United States, up to 20 per cent of foods are discarded due to spoilage in the supply chain. *In fact, the cost of global shrinkage from expiry, loss, and damage before delivery is USD 60 billion per year.* This is a huge cause for concern. Besides having to face such losses in the supply chain, the various traceability mandates add to the problems faced by US food products manufacturers. The situation is not going to get any better.

Another major source of concern is theft. Direct and indirect cost of cargo theft is USD 20 - 60 billion annually. A recent study showed that lost merchandise is equivalent to roughly 1.7 per cent of total retail sales. 48 per cent is attributed to employee theft, 32 per cent to shoplifting, 15 per cent to administrative error, and 5 per cent to vendor fraud. Stock outs at retailers' are costing 6 per cent of sales. With the addition of counterfeiting of products, this costs the industries over USD 100 billion annually.

For companies looking at multiple markets, the lack of visibility in their supply chain can amplify into huge problems leading to tremendous loss of revenue. One method of circumventing this problem is to have systems capable of processing huge amounts of past data and creating forecasting models based on this data. But the reliability of these systems decreases as the data keeps changing, creating low levels of predictability. On the other hand, a collaborative model would do wonders for the system, but such levels of collaboration would also entail availability of real-time data.

Visibility is not the only issue. Besides that, there have to be applications that can use this data for business purposes.

With TCS RFID Solutions, years of experience in business practices comes hand in hand with RFID technology expertise, helping companies understand and use RFID data for business applications.

The Hype of Supply Chain Management (SCM) Systems

In the late nineties, SCM promised to be the solution to all problems in the supply chain. But, by the end of the decade, SCM had not lived up to its promise. Even big customers such as Cisco had to write off more than USD 2 billion — even though it had been considered best in class in supply chain practices. The biggest misconception in the industry is that SCM technology allows control of supply chain and vendor resources. Nothing could be further from the truth.

Companies that set up SCM systems failed because they did not understand and properly gauge demand.

Dave Caruso, AMR Research, states (in his article *Demand-Driven Supply Networks: SCM Done Right*) that SCM is no longer a four walls activity. SCM must encompass not only managing the planning and execution of daily operations but also broaden its reach to its suppliers and customers.

Traditional SCM deals poorly with rapid change. Many implementations of SCM work best during the steady-

state demand periods of a product lifecycle, but poorly during its ramp up and down. With product lifecycles shortening and configurations / segmentations increasing, traditional methods of SCM fit poorly into dynamic

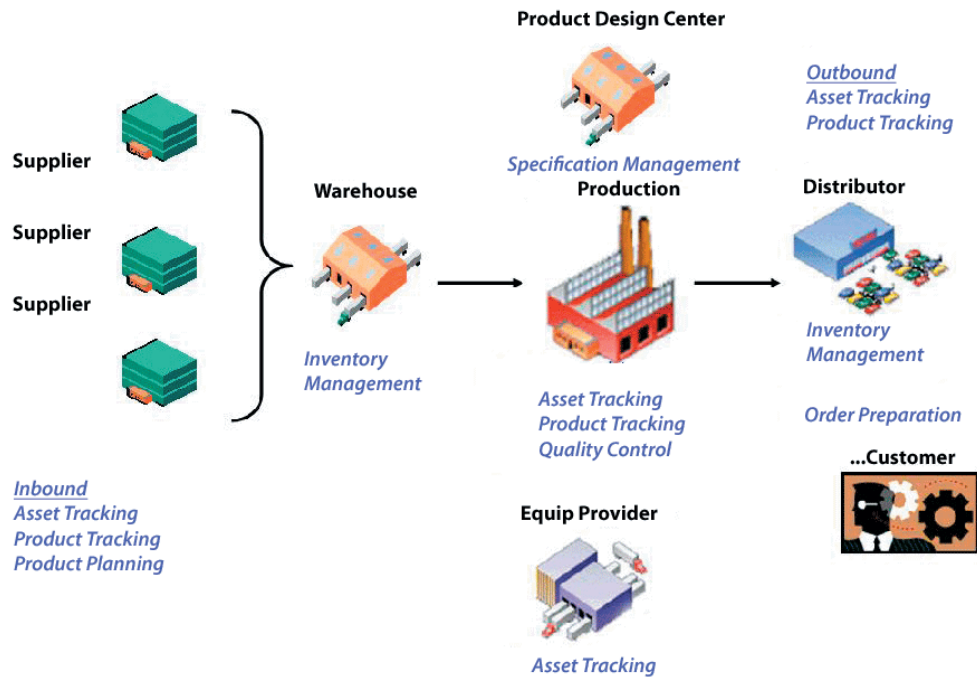


Figure 2: RFID Solutions for a Manufacturer's Supply Chain

product portfolios. Supply chain variability is one of the chief threats to profit margins, and in some industries this can be as high as 100 per cent. Misplaced, damaged or stolen stock also confuses the supply chain systems, resulting in pick instructions being generated by a system trying to send virtual inventory which is available only within the memory of the computer system.

SCM technology works well if and when control is already in place.

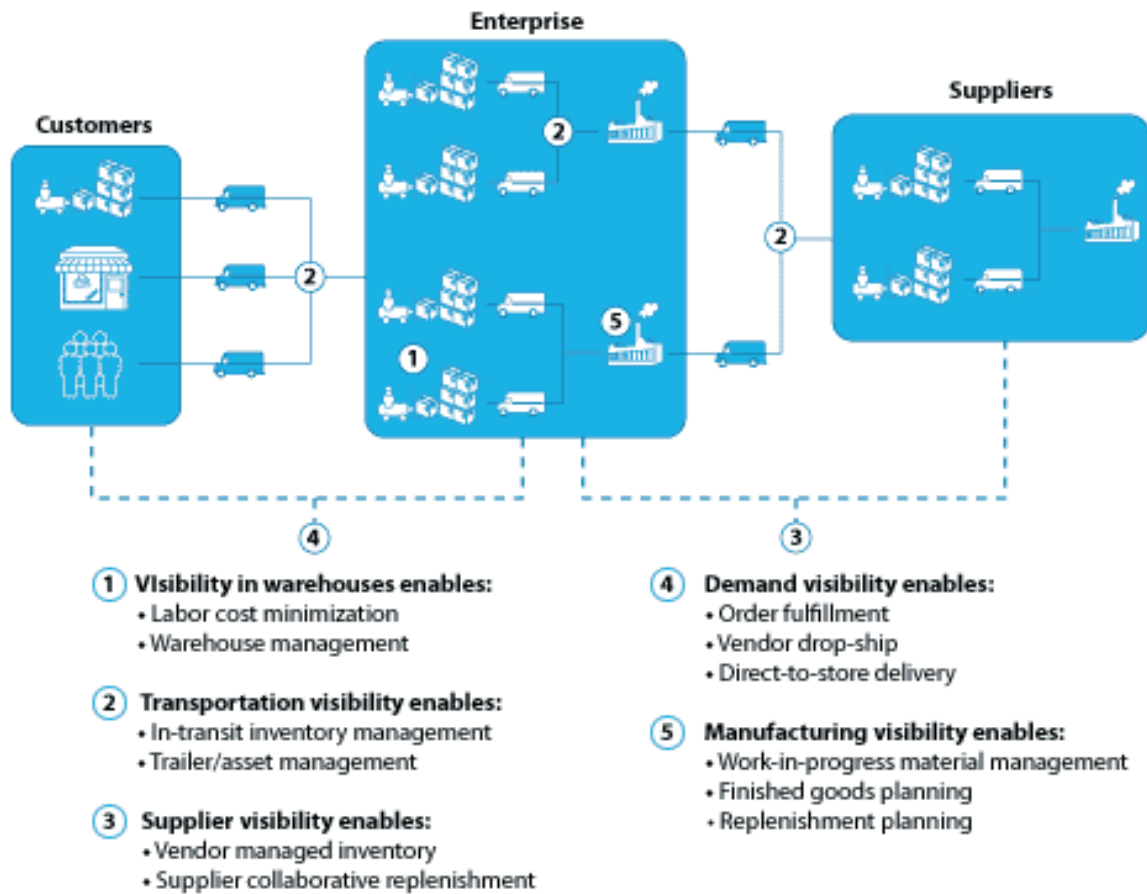
It is no wonder, then, that retail giants like Wal-Mart, Target and others are constantly monitoring their supply chain and identifying innovative methods to streamline their processes and increase the efficiency in the chain. The main aim of this exercise, besides cutting cost, is of course, to increase margins. These companies are now looking towards technology like RFID to help them in their endeavours.

But the real question is: What can RFID do?

Driving efficiency using RFID

Control and management of a logistics operation relies on having visibility of information about stocks, flows and performance within the supply chain. This information must also be presented in a manner that is easy to assimilate. It should present exceptions wherever possible, and most importantly, based on current, accurate data. RFID can provide the data and the solutions for the supply chain. This technology can not only provide the information but also the applications of this information.

According to a Gartner report (Predicts 2005: New SCM Markets for Business Applications), manufacturers will begin to use data collected from RFID tags to refine forecasting and replenishment algorithms. They will use this new data to build better demand forecasts with the granularity to do store-by-store forecasting in



Source: Forrester Research, Inc.

Figure 3: RFID technology brings a whole new perspective to the term visibility.

collaboration with the retailer. This detailed demand forecast will also be used in conjunction with emerging integrated demand and replenishment planning (IDRP) tools to trigger replenishments from the manufacturer to the retailer’s warehouses (as is leading-edge practices), as well as to trigger replenishments from the retailer’s warehouses to its stores. This process and these tools will change every aspect of the relationship between retailers and manufacturers.

Besides better forecasting and replenishment, RFID technology goes beyond the traditional bar code product identification, helping fortify visibility with better data granularity and more timely updates.

***Electronic Product Code (EPC)** standardizes the flow of information between partners in the supply chain. As envisaged, the global EPC network aims to use RFID technology as an enabler to increase the collaborative powers of different firms within a supply chain. This further increases efficiency of the supply chain.*

Examples of important questions to which answers would be easily available include:

- What is my pick/let-down/put-away rate across my distribution centres?
- How does performance relate to standard times across days of the week?
- Which lines are carrying more than 15 days of stock?
- Which lines are projected to have stock shortages tomorrow?
- Which suppliers are delivering more than two hours from the original appointment time?
- Which suppliers are delivering with shortages exceeding one per cent?
- For which suppliers does factory gate pricing give me an advantage over the full landed cost?

RFID-enhanced Supply Chain

The use of RFID leads to increased efficiency in the supply chain, thereby providing the following benefits:

- Increased revenue due to increased on-shelf availability.
- Improved customer service due to more responsive production, reduced order cycle times, automatic replenishment and enhanced collaboration.
- Reduced operating costs because of elimination of manual physical inventory counts, increased shipping and receiving efficiency and accuracy, faster picking process in the warehouse and reduced number of non saleable products (spoilage, seasonal and promotional items), improved stock visibility and traceability.
- Optimization of assets employed using reduced inventory levels. This leads to improved forecast accuracy, and improved visibility. One of the direct outcomes of optimization is reduced warehousing requirements and improved productivity through Just-in-Time (JIT) delivery.
- Information sharing leading to better collaboration between trading partners.
- Enhancement of safety and quality controls leading to reduced shrinkage.
- Enhanced responsiveness to product recalls and food safety concerns, and reduced exposure to public safety risks.

Why RFID now?

- Real time visibility is a prerogative for all companies looking at squeezing their supply chain to realise its full benefits. RFID can do that.
- Big retailers such as Wal-Mart and government agencies such as the US Department of Defense have issued mandates demanding that their suppliers RFID-tag all merchandise by 2005.
- The US government's Bio Terrorism Act and the European Union's Food Traceability Directive are increasing requirements for food traceability and safety. For many organizations, RFID is essential to fulfill these standards.
- RFID technology is maturing at a fast pace.
- Cost of RFID tags and readers are falling rapidly.
- Global standards like Electronic Product Code (EPC) and International Standards Organisation (ISO).

Challenges to RFID deployment across the supply chain

Coordinating the activities of sequential firms in a supply chain generally requires changes in the business process that may be time-consuming and costly. These include restructuring information flows, incentives, roles, and responsibilities. More importantly, they require adaptation by multiple firms, each of which has its own routines, organizational structure, strategy, and objectives. Change across the boundaries of firms is more difficult than within a single firm.

For example, any of the adaptations that adjacent firms in the supply chain must make are specific to the relationships between those firms. Once the partner firms have invested in compatible technology and processes, they have created costs which they switch to other partners. Fear of being locked in by switching costs often makes firms reluctant to enter into these relationships in the first place. It is no wonder, then, that EPC standards will produce technical solutions that lower switching costs. In this context, it is necessary to deploy RFID technology in a phased and collaborative manner with other partners.

Incorporating vast experience in supply chain management, TCS has produced enterprise-wide supply chain solutions for major companies' world-wide. In addition to the technical expertise in SCM and other related technologies, TCS has rich domain experience in the supply chain management space. Combined with the expertise of our alliance partners (ORACLE, SUN, Texas Instruments, EMS, Hitachi) it gives us the confidence to deliver RFID based Supply chain solutions for your needs.

TCS RFID Solutions

TCS RFID Solutions group focuses on creating and delivering RFID-based solutions to TCS' clients. These solutions build upon TCS' domain experience, enterprise applications expertise and systems integration capabilities with skills and assets in core RFID technology (hardware / sensing technology) and middleware. Taking a business and processes perspective, TCS focuses on using technology for process improvements and elimination of customer's pain areas.

Leverage domain expertise to focus on realizable business value

TCS has vast experience in various domains, having worked with the leading organizations of the world across industries. The knowledge thus gained helps TCS to focus on realizable business value by fine-tuning the solutions to the client's stated and implicit business needs.

Enterprise applications expertise

TCS has extensive experience and expertise in enterprise applications, supply chain management and execution and enterprise assets management. This provides the necessary grounding to work with application vendors and clients in order to craft solutions addressing business needs, and integrating seamlessly with the existing applications deployed in the client's organization.

Alliances

TCS has struck alliances with leading technology (Hitachi, EMS, and TI), middleware and application vendors that enables it to work with the latest technology. TCS is a member of EPC Global and actively participates in the development of hardware and software standards.

Agility and higher productivity through reusable tools and assets

TCS has developed solution frameworks, approach guidelines, application prototypes and reusable components. These assets enable TCS to deliver with greater agility and flexibility.

RFID technology expertise

TCS invested early in RFID technology by setting up a RFID centre of excellence and a RFID lab. This has helped develop extensive in-house expertise in the areas of RF engineering, sensing system design, edge-ware/middleware deployment and application integration. It also gives TCS the capability to rapidly set up project teams and deliver to expectations.

TCS RFID Solutions has the capabilities to help organizations along their RFID discovery and implementation path. From immediate short-term RFID solution development to long-term implementation strategies,

TCS RFID Solutions can help you derive true value from RFID.



TCS RFID Solutions

TCS RFID solutions group focuses on conceptualizing, designing and delivering RFID based identification and tracking solutions. These solutions build upon TCS domain experience, enterprise applications expertise and systems integration capability with skills and assets in core RFID technology (hardware/sensing technology) and middleware. Taking a business and processes perspective, TCS focuses on using technology for process improvements and elimination of customer's pain areas.

About Tata Consultancy Services

Tata Consultancy Services (TCS) is among the leading global information technology consulting, services and business process outsourcing organizations. Pioneer of the flexible global delivery model for IT services that enables organizations to operate more efficiently and produce more value, TCS focuses on delivering technology led business solutions to its international customers across varied industries.

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