

The major drivers that impact logistics and supply chain management



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This paper will discuss the major factors that impact logistics and supply chains in the pharmaceutical and the Information Technology (I.T.)industry.

The areas covered will be:

- Information Technology
- Supply chain collaboration
- Vendor Managed inventory (VMI)
- Customer service

The principles discussed can be adapted in other supply chains including materials management in the supply departments of hospitals. Organisations often question why a particular business or a hospital provides a superior customer service compared with other business's.

There are many factors which can contribute to this situation and the key is the people who work for this organisation, strategic vision and management styles .The other factors are great communication skills, problem solving ability, computer systems, policies and procedures, culture, working environment, education, multi-skilled staff, contingency planning, process of continuous improvement, development and the implementation of Key Performance indicators (K.P.I.).

Impact of Information Technology on logistics and Supply chain management

Information technology is a critical driver for logistics and supply chain management success.

Speed and agility are critical for organisations, businesses and marketers to achieve superior customer service. According to Christopher (1998), in today's highly competitive global market place, there is an increased demand placed on organisations to find new ways of creating and delivering value to customers. He also states that through information technology integration the twin goals of cost reduction and service enhancement can be achieved by the supply chains.

According to Rupert Murdoch, "The world is changing very fast. Big will not beat small anymore. It will be the fast beating the slow." This perspective is extremely relevant in the logistics and supply chain environment in order to reduce costs and improve service.

Michael Porter's the value chain (1985) has placed emphasis upon search for strategies that will provide superior value in the eyes of the customer.

The value chain can be categorised into two types-primary activities (inbound logistics, operations, outbound logistics, marketing and sales, and service) and support services(infrastructure, human resource management, technology development and procurement).

These support activities are integrating functions that cut across the various primary activities within the firm. Competitive Advantage is derived from the way firms organise and perform these discrete activities within the value chain. To gain significant competitive advantage over its rivals, a firm must deliver these activities more efficiently than its competitor's or performing the activities in a unique way that creates greater differentiation (Martin,C 1998)

One good example is Dell computers and Michael Dell's business definition "Our business is about technology Yes. But it's also about operations and customer relationships". The I.T. is fully utilized by Dell computers . The demand that is created by the marketing functions through product, price, and promotion mixes with logistics functions that is geared towards demand satisfaction through supply, sourcing and system (IT) mixes, in effect, getting the right product to the right place at the right time.

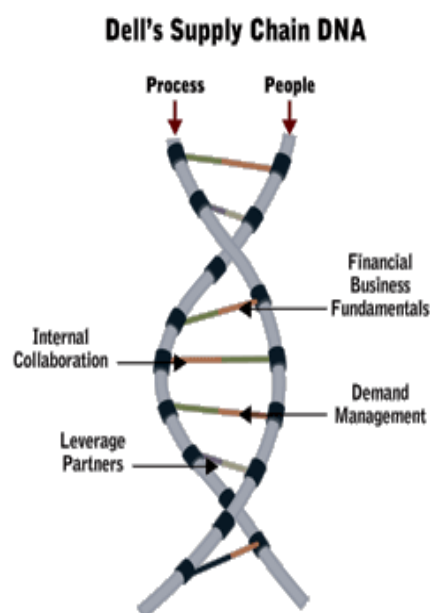


Figure 1 – Source: Supply Chain Management Review, 2004

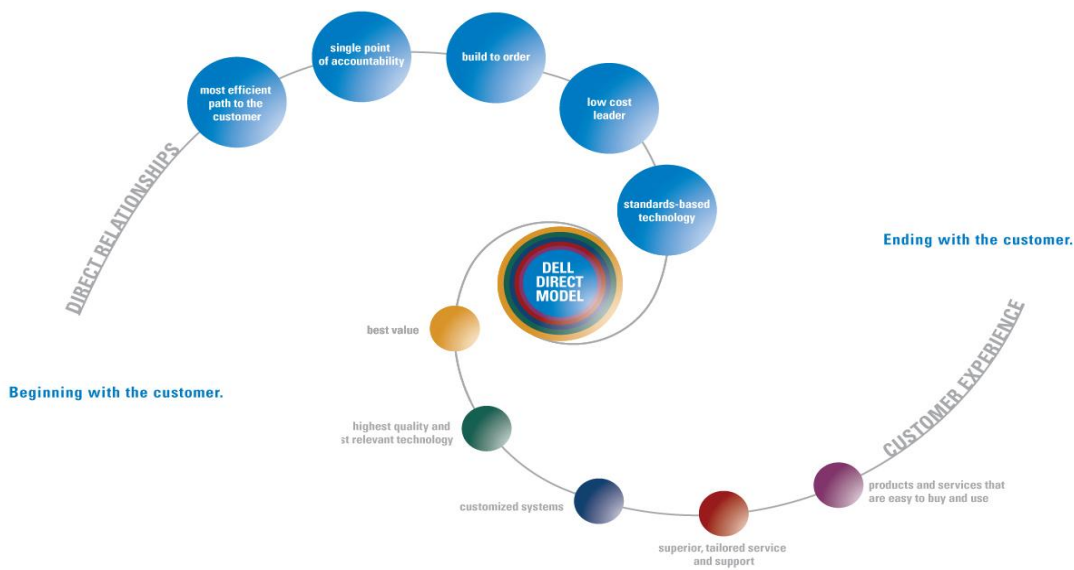


Figure 2 – Source: Dells value chain

Value parameter driving the PC industry.

An efficient and agile supply chain is now considered essential for developing a sustainable competitive advantage. Now with the aid of breakthrough progress made in the area of I.T. pharmaceutical companies are deploying increasingly sophisticated solutions to further improve the efficiency of the supply chains. Products have Global Trade Item Number (GTIN) which describes a family of GS1 global structure. These GTIN identify a product by way of barcodes and Radio- Frequency identification (RFID). The basic need and the goal of the pharmaceutical industry are to emphasize on regulatory compliance and safety of products, but also include leveraging information, to be more responsive to the needs of the customers. In order to efficiently enhance patient safety and become more demand driven the pharmaceutical supply chain industry can adopt a technological framework that follows and includes

ITEM LEVEL DATA MANAGEMENT:

In the pharmaceutical industry most of the companies have the ability to manage the business information on the transactional level i.e. orders, shipment, payment etc., providing insight into the financial and operational events. Item level data can provide insight into the physical data movement of particular products and also enhance visibility of end user demand, contract compliance and reverse logistics. Achieving this visibility requires unique identifiers in product labelling and packaging. Technologies such as RFID and barcodes enable packages to carry a unique identifier, and when coupled with an infrastructure of readers can generate data related to the event of the drugs. RFID will assist to address the concerns arising from drug counterfeiting, and assist in tractability and trace drug recalls to ensure proper disposal.

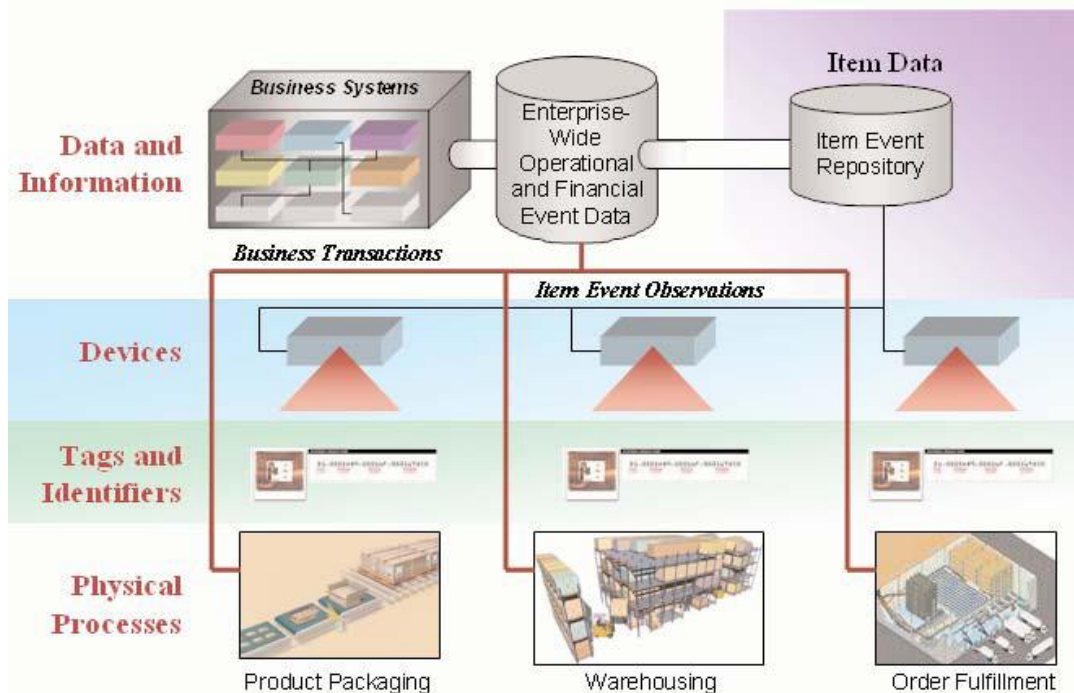


Figure 3– Typical System Architecture to Support Operational, Financial, and Item-Level Data (©2006 VeriSign, Inc.)

An Electronic Data Interchange (EDI) model needs to be in place to ensure cost efficiency and reliable data interchange. This enables departments like order management, shipment, payment, pharmacy, hospitals, customers etc., to have more visibility and accessibility of the information on availability, specifications of the ordered drugs. Thus, making the process more transparent for all parties.

From the following diagram (Figure 3) indicates how infrastructure can be set up to accommodate cost effective and efficient availability of item information. This diagram assumes that manufacturers, wholesalers, pharmacy chains and hospitals establish their own item level data management capabilities.

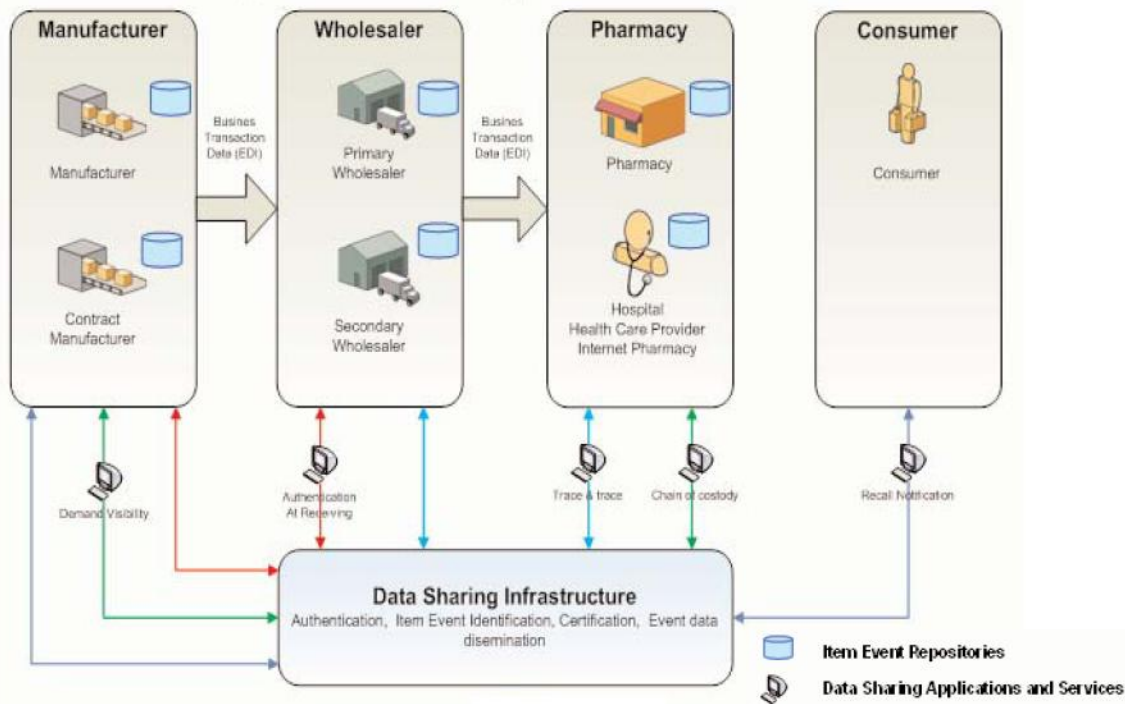


Figure 4 – Item level data sharing infrastructure (©2006 VeriSign, Inc.)

The two examples given are from two dynamic industries where speed, accuracy, track and trace capabilities are crucial for success. Great information technology would deliver superior customer service and provide the business with competitive advantage. Despite the initial cost of the IT infrastructure, it would still be beneficial in providing long term cost and value advantages.

The cost to serve would determine long term competitive position as both industries are facing challenges. The computer industries components cost is decreasing and cost pressure is increasing and the pharmaceutical industry is facing the incoming generic medicines and the federal government's reform of the Pharmaceutical Benefits Scheme (PBS).

Business survival in a cut-throat environment is a "dog eat dog situation". Darwin's theory regarding the survival of the fittest is quite clear in this circumstance.

The business's with great IT traits will survive and prosper in the long term however there are huge challenges with the implementation of new systems. If not properly managed there can be huge frustration and the cost of doing business can increase. There are several examples where implementation of new technology has gone wrong. For instance the SAP software system implemented by a major healthcare manufacturer and the Victorian State governments Myki ticketing system.

The impact of Global Financial Crisis (GFC) has impacted on inventory holding of businesses such as Just in time concepts (JIT). According to Paul Little who is the former CEO of Toll Logistics who spoke at RMIT university in May (2011) said after GFC businesses purchase smaller consignment of inventory.

In his words "airfreight on fire" and the speed to customers is crucial for success. There is a monumental shift in the supply chain of the future as compared with traditional supply chain's of

the past. The Just In Time (JIT) concept is applied by all parties from manufacturers , wholesalers, Hospitals and customers.

Collaboration in the supply chain

Collaboration is the cornerstone of effective supply chain management.

Collaboration across the supply chain is dependent on internal integration of the various conduits. A supply chain integrative framework is required to define the nature of collaboration required in alliances and enterprise extension. Such framework requires that capabilities and competencies essential to integrating supply chain logistics are defined and implemented. The creation of value related to supply chain integration is best achieved by simultaneous orchestration of for critical flows such as product, service ,market accommodation, information, and cash.

Five Levels Explain the Supply Chain Evolution

Business Application	Levels 1&2 Internal Supply Chain Optimization	Level 3 External Network Formation	Level 4 Value Chain Constellation	Level 5 Full Network Connectivity
	Supply Chain Optimization	Advanced Supply Chain Management	e-Commerce	e-Business
Design, Development Product/Service Introduction ¹	Internal Only	Selected External Assistance	Collaborative Design – Enterprise Integration and PIM linked CAD/CIM	Business Functional View – Joint Design and Development
Purchase, Procurement, Sourcing	Leverage Business Unit Volume	Leverage Full Network Through Aggregation	Key Supplier Assistance, Web-Based Sourcing	Network Sourcing Through Best Constituent
Marketing, Sales, Customer Service	Internally Developed Programs, Promotions	Customer-Focused, Data-Based Initiatives	Collaborative Development for Focused Consumer Base	Consumer Response System Across the Value Chain
Engineering, Planning, Scheduling, Manufacturing	MRP MRPII DRP	ERP – Internal Connectivity	Collaborative Network Planning – Best Asset Utilization	Full Network Business System Optimization shared processes and systems
Logistics	Manufacturing Push – Inventory Intensive	Pull System Through Internal/External Providers	Best Constituent Provider	Total Network, Virtual Logistics Optimization
Customer Care	Customer Service Reaction	Focused Service – Call Centers	Segmented Response System, Customer Relationship Management	Matched Care – Customer Care Automation and Remediation
Human Resources	Regulatory Issues/hiring, Recruiting, Training	New work models, Training	Inter-Enterprise Resource Utilization, Training	Full Network Alignment and Capability Provision
Information Technology	Point Solutions Internal Silos	Linked Intranets Corp Strategy/architecture	Internet-based Extranet Shared Capabilities	Full Network Comm. System Shared Architecture Planning

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Figure 5 Poirer 2010 (workshop at Swinburne university)

Supply Chain Maturity Model as a Calibration Tool

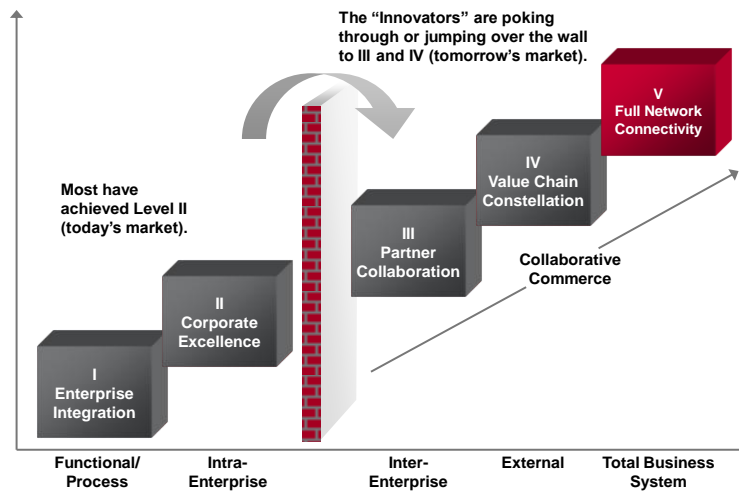


Figure 6 Poirer 2010 (Work shop at Swinburne university)

Vendor Managed Inventory (VMI)

Customers and suppliers could drastically improve the forecasting and planning process between business's and its suppliers by using such VMI techniques. This system has been applied in organisations such as Dell which further synchronises this with Customer Relations Management (CRM).

There are systems that provides closer relationships with customers. Such collaboration could help business development and maintenance of strategic relationships with all key stakeholders, promote a resource and information sharing culture and reduce inventory levels and operational costs.

The Hospital can also benchmark either related or unrelated companies and industries in order to measure its performance level and continuously improve (Bowersox et al. (2008) The Alfred hospital is one the most successful hospital in utilising VMI model in Victoria .The hospital maintains a low level of inventory and also manages its two important flows in its supply chain – inventory and information efficiently.

According to Cohen and Roussel (2005) in a VMI relationship, the supplier is responsible for making sure that the customer never runs out of inventory of critical products.

Figure 1: Alfred Hospital Supply Chain

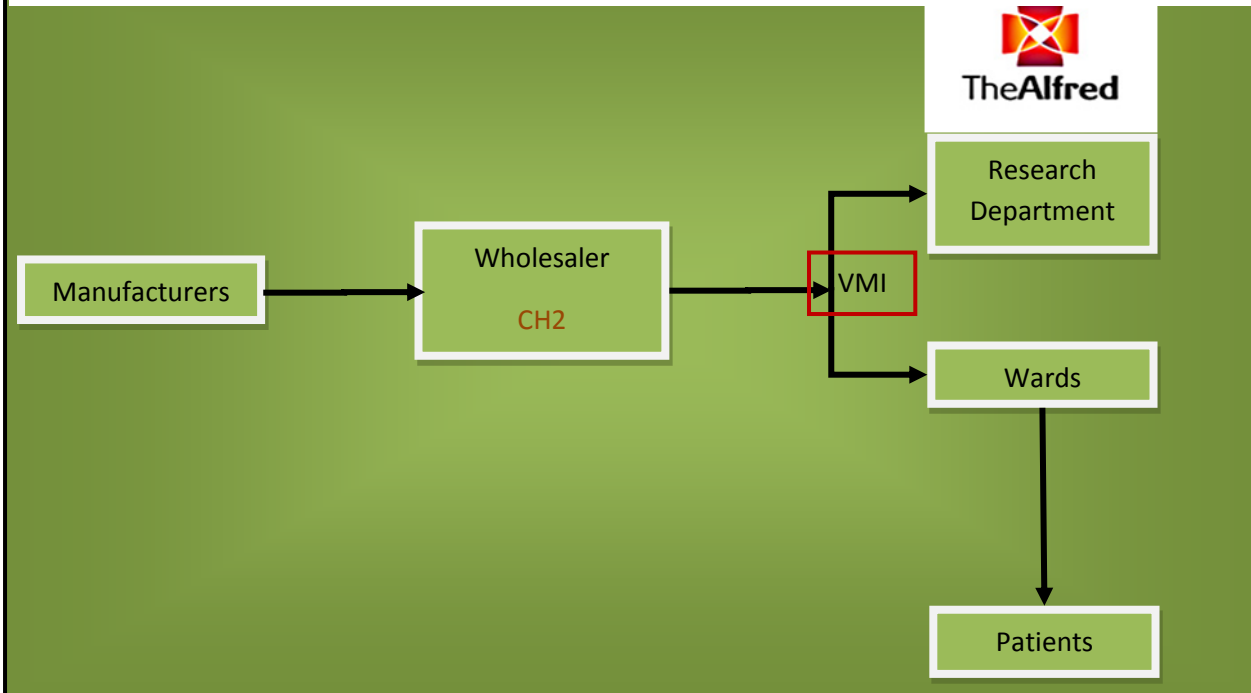


Figure 7 Source: Singh, 2009.

According to Kazim (2007) in this model the inventory is managed and controlled by the supplier at the customers end. The customer is the Alfred hospital whereas the supplier is the wholesaler-CH2. CH2 delivers the products or pharmaceuticals directly to the wards in the hospital via the ward box system which reduces the time required to serve the customers. Also as the inventory is managed by the supplier the bullwhip effect as highlighted by Bowersox et al. (2007) decreases drastically (Kazim, 2007). This in return also assists forecasting the demand of pharmaceuticals. After the implementation of VMI at Alfred hospital it was able to reduce the amount of capital invested substantially.

The risk of the V.M.I. model is if there is a strike action, fire or natural disaster if the wholesalers premises and inventory gets destroyed the time it will take to look at contingencies measures can be critical to meet patient requirements such as ward box. This area of risk needs to be clearly spelt out in the contract agreement.

The benefits are lower inventory holdings, the expired or obsolete products cost impact is lower, the stock outs are lower due to wholesaler's performance measurement metrics.

Kholi and Jaworski (1990) propose that market orientation is an approach in which businesses seek to understand and anticipate their customer's expressed and latent needs to develop and deliver superior solutions. This is via inter-functional integration to achieve sustainable competitive advantage.

The advancement of information technology and globalisation has put tremendous pressure on personal computers.

Manufactures to develop a holistic and optimised view of the supply chain i.e. decreasing inefficiencies in the value chain while increasing the flexibility and responsiveness of the physical logistics at the same time. The company's supply chain competency comprises four

qualities, demand management, internal collaboration, leveraging partners, and financial fundamentals.

Customer service

Availability of product to the customer is one performance parameter of delivering customer value or accommodating the customer (Bowersox et al., 2007). The various measurements of availability of the product to the customers are the fill rate, stock-outs encountered and the number of back orders generated.

Every year in hospitals there is a survey called 'Press Ganey' done by the government in order to determine the customer satisfactions in the hospitals. Within the hospital the patient may sometimes experience a greater level of anxiety and stress normally associated with sickness. An article in 'Press Ganey' highlights that the 'waiting time' to treatment is a major factor in determining customer satisfaction in hospitals (The Satisfaction Snapshot, 2006). It is suggested that the longer a patient has to wait for treatment the greater the level of dissatisfaction.

Conclusion

The supply chain is a critical strategic asset of any business and needs constant refinement to meet superior customer service. Dell computers is constantly adapting its supply chain due to the evolving nature of the I.T. Industry, the key concept being speed to market and optimal deployment of inventory.

The pharmaceutical supply chain is unpredictable, complex and forecasting can be challenging due to various factors including seasonal usage, patient mix, doctors prescribing patterns, generics versus originator brands, monopoly suppliers and high cost of new treatments. The logistics and supply chains need robust information technology, good collaboration skills which will lead to outstanding customer service.

The cost to serve customers requires a fine balance which should be neither too much nor too little (no over-servicing). Hospitals also need to be innovative in service provision similar to any business enterprise. The inventory management needs to be meticulous and collaboration between hospitals to reduce wastage of expiring drugs and moving slow moving drugs to hospitals where it can be used.

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