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Logistics Case study---DELL Company

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Abstract. this article examines the operations of DELL, a technology business that produces and sells PCs, servers, data storage devices, and networking equipment, are examined in this article. The article examines the significance of capacity management and inventory management, two critical components of a company's operations that can have a considerable impact on its profitability. Capacity management is concerned with matching supply and demand by planning and regulating supply or processing, whereas inventory management is concerned with having the right items in the right place at the right time. DELL has acquired a competitive advantage by implementing the build-to-order (BTO) approach, which allows the corporation to construct products only when a validated order is received, allowing consumers to receive personalized products on an individual basis.

In conclusion, DELL's successful operations highlight the significance of excellent capacity and inventory management, supply chain management, and new business models. The use of the BTO model and an agile supply chain management approach by the company has allowed it to respond swiftly to changing market demands, supplying tailored products to specific clients. The company's inventory and data management operations have been optimized thanks to effective information exchange, vendor-managed inventory, and enterprise resource planning tools. To achieve long-term success in today's technology-driven company environment, cloud computing, and data security threats must be carefully considered.

Keywords: JIT system; ERP system; DELL’s supply chain.

1. Introduction

DELL is a Fortune 500 company founded in the United States in 1984 by Michael DELL. It designs and sells computers, but is also involved in the manufacture and sale of servers, data storage devices, and networking equipment. DELL's commitment to listening to customers' needs and providing innovative technologies and services that they trust and value has led to its success in being ranked 83rd on the Fortune 500 list in 2023[1]. With the global computer market divided between HP, Apple, Huawei, and Asus, DELL is the top computer systems company in terms of global market share, as well as customers in business, education, government, and other sectors. DELL's product lines include desktops, laptops, network servers, workstations, and storage solutions.

Efficient supply chain management is critical to any organization's success, and it includes a variety of procedures such as capacity management, inventory management, and delivery performance.

Capacity management is essential for businesses to guarantee that their output is optimized regardless of time or place. This method entails planning and controlling supply and demand while remaining adaptable to external situations. Improper capacity management can result in customer loss and market share loss, thus mature organizations must have a capacity management plan in place to respond to changes in demand. Inventory management is concerned with having the appropriate goods in the right place at the right time, including working stock, safety stock, and reconciliation stock. Inventory is one of the most critical aspects determining a company's profitability, and if not managed effectively, it may lead to large amounts of goods piling up on the premises, affecting cash flow and causing order delays. Delivery performance is another essential

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aspect of supply chain management, as it demonstrates a company's ability to deliver goods and services efficiently and meet customer expectations. To improve delivery rates, organizations must improve planning, monitoring efficiency, and properly break down tasks, while also focusing on inventory management to ensure that there are enough raw materials for production and finished goods to meet orders. Good delivery management can enhance efficiency, create trust with consumers, enhance reputation, and improve customer happiness in the marketplace.

2. BTO for DELL

Build-to-order (BTO) is a manufacturing process in which the product is manufactured only when a verified order is received, thus the consumer determines the schedule and amount of production. Orders can be placed for individuals, enterprises, or organizations, and they can be filled manually or through a manufacturing process. BTO is ideally suited to highly customized or small-quantity products, and it is most commonly used in the lifestyle craft and catering industries. The benefits of the BTO strategy include the flexibility to give consumers the exact product they need on an individual basis, lower finished goods inventory and a lower risk of stock obsolescence[2]. It is also more adaptable for the consumer and can help the company's cash flow problems. The negative is that manufacturers are readily swayed by consumer and market demand, resulting in fluctuating labor efficiency and lower utilization. The development of DELL was sped up by the build-to-order production method, which also gave rise to the myth of DELL's zero inventory. DELL became well-known for its low material and finished goods inventories. Customers can place orders directly over the phone or through the company website, orders are processed by evaluating customer credit and technology, orders are qualified and sent to the manufacturing plant, where the product is built, tested, and packaged in about eight hours, and each customer receives their customized computer, outperforming many companies in the industry in terms of speed. DELL moved the cost of inventory to other parts vendors by cutting out much of the research and development labor, merchants, and other intermediaries, keeping its costs low by maintaining a small inventory. Due to lower costs, DELL has simultaneously reduced the industry's profit margin and boosted its market share. For the consumer, It enables a more varied and customized product selection, while for DELL, It does away with the need to maintain significant inventories of parts, effectively lowering capital expenditure and boosting the company's liquidity. The upstream and downstream of the supply chain, where all raw materials, semi-finished goods, and final items are in the production process, are now where DELL views inventory management instead of its warehouse. DELL and them fully coordinate, exchange inventory information and manage inventory collaboratively across the chain.

However, DELL has reached the point of diminishing returns because its strategy is no longer a trade secret. The supply chain advantage, while still in place, is no longer as useful as it once was, and DELL's direct sales strategy faces threats from Apple's design as well as P&W's retail skills[3]. DELL faces a trade-off on how to perfectly take care of delivery performance with low inventory. Each customer at DELL receives their computer in a variety of configurations, DELL has established Experience Centers to raise awareness of the need for customers to customize their purchases to meet their needs. But DELL's supply chain was extremely complex because the company intended to create unique goods for each customer. If a consumer ordered the basic model, the profit would not be as big as if they had ordered the premium model. The basic type of accessories had to be supported by the premium model. To ensure effective and efficient operational performance, trade-offs between supply chain complexity and the personalized experience are therefore necessary.

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3. Management of DELL

3.1 JIT system

The JIT system (Just in time), a Japanese production method represented by the Toyota Production System (TPS), is a manufacturing system established by Toyota Motor Corporation[4]. JIM refers to the practice of minimizing production inventories and concentrating all efforts on accomplishing predetermined goals[5]. For DELL, the JIT approach to inventory management was just right for its market strategy, as the industry in which DELL operates represents a strong focus on time, with customers willing to pay high prices for the latest technology and therefore needing to get new and good to customers promptly to remain competitive.

Eliminating inventory costs and not having to pay extra for the computers it makes are two factors that contribute to DELL's cheap costs. What enables DELL to acquire market share at a cheap cost among its competitors is the employment of JIT management tactics to share the expenses of inventory, inventory space, inventory wastage, etc. with the parts makers and the higher end of the supply chain to bear these costs. This immediate response also enables DELL to gather firsthand data on the market, which it can then analyze to identify market trends and introduce new items to clients ahead of rivals, offering an efficient channel for customer interaction[6].

A vendor-managed inventory (VMI) is at the core of DELL's third-party logistics approach, and they are critical for managing and planning the whole production line. Suppliers sign contracts and deposit materials in the VMI warehouse for 8 to 10 days, following which client orders are confirmed and VMI swiftly delivers the parts to the customer service center and settles the bill on the delivery note [7]. DELL's advanced information systems, such as ERP, and MRP, connect MRP planning to the production job site control system (Warehouse Control System), and the entire production logistics system is in a dynamic monitoring record. This makes everyone accountable for supply based on actual demand, and the entire supply chain replaces inventory with information. It is also easier to trace quality issues back to their source.

This approach meets all requirements for material supply timeliness, data gathering accuracy, equipment responsiveness, and even post-sales product traceability. Suppliers can obtain real-time demand information, and DELL can understand partners' inventory and quotations in real time. Data collection and information sharing not only strengthen supply chain communication, but also maximize supply and demand balance, reduce inventory, and reduce DELL's risk of depreciation due to rapid product updates [8].

Adopting JIT management has advantageous environmental implications in addition to economic ones. The JIT methodology may help reduce waste brought on by oversupply, inefficiencies, processing, inventory, and mobility.

3.2 ERPII for DELL

Enterprise resource planning (ERPII) is characterized as a new business strategy comprised of a set of industry-specific applications that optimize customer and shareholder value by building and optimizing intra- and inter-company processes, collaborative operations, and financial operations processes. The goal is to properly allocate limited resources to the most worthwhile possibilities while producing visible results. To distinguish it from ERP's emphasis on internal management, the idea of 'Collaborative Business' has been added. The company makes extra expectations on the ERP processes and external elements, which is dubbed "ERP II".

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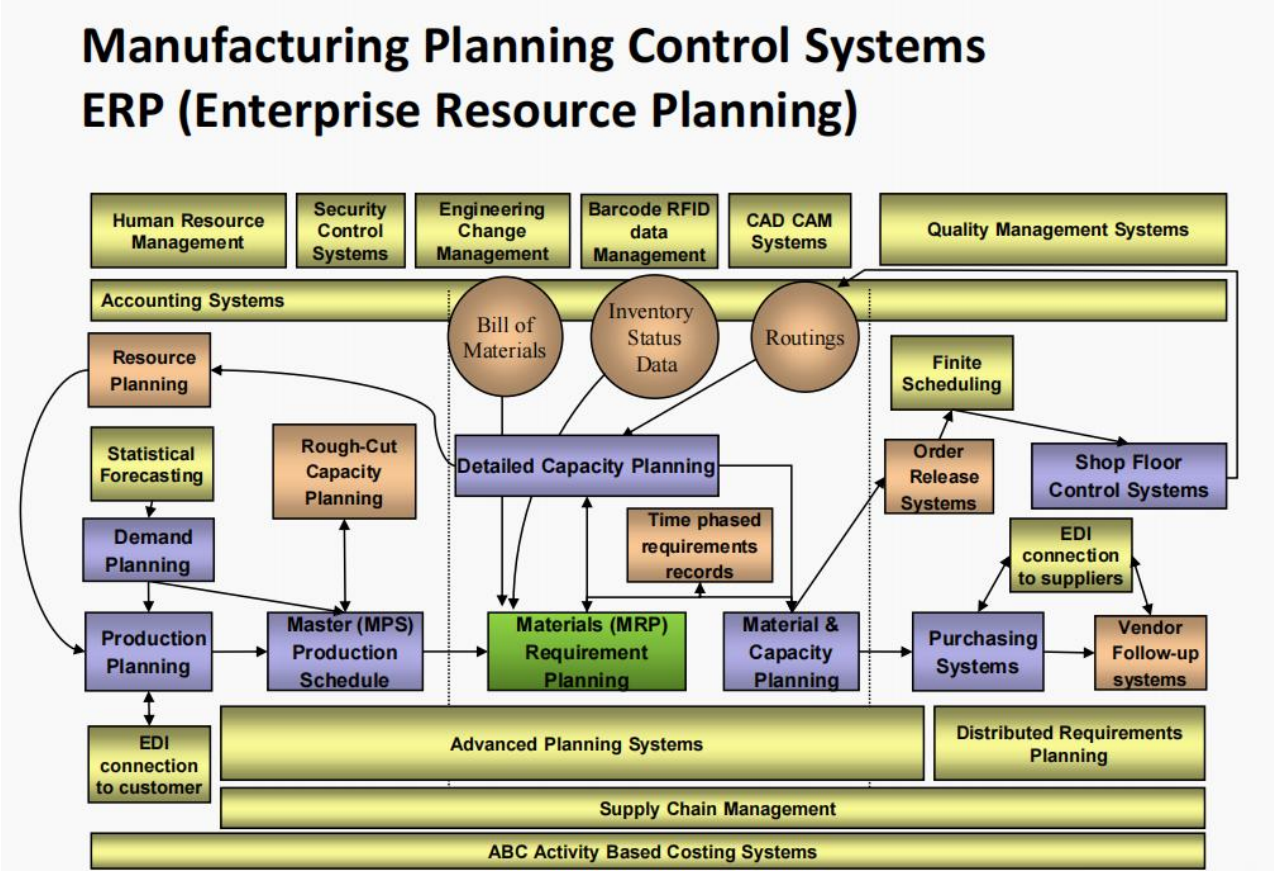

Figure 1 ERP systems

Although DELL shifts inventory demand to the upper end of the supply chain, it also shifts the risk to the upper end. DELL must prioritize information sharing along the supply chain, or else the Bullwhip effect will cause the higher end of the supply chain to make incorrect decisions. At the same time, DELL must be strict in screening the quality of the higher end of the supply chain; if any part is defective, the customer's delivery time will be impacted. DELL must share information with the higher end of time and change the supply and demand connection dynamically in time. The supply chain is the network of businesses through which goods and services are distributed to consumers, whereas traditional inventory management relates to the administration and control of the number of materials in one's inventory. All phases directly or indirectly engaged in satisfying client requirements are included in the supply chain, including manufacturers, suppliers, transporters, warehouses, retailers, and even the customers themselves [9].

VMI can aid in the implementation of orders and the overall inventory management process for the organization. In this case, data is no longer specific to one party but is shared by both parties to convey timely and correct order information, which can improve the relationship and collaboration between suppliers and distributors and enable both parties to align their aims for optimizing operations [10]. Therefore DELL needed to have data management to add to the supply chain management system, using the ERP system, DELL got a good reflection of the physical environment and for DELL, ERP was the best option.

3.3 DELL's supply chain

Lean supply chain (LSC) management is more concerned with work efficiency and strives to reduce internal and external variability in order to prevent the likelihood of resource waste. This management can boost business performance while also increasing supply chain competitiveness and flexibility.However, the disadvantages are obvious, as this management method requires each production line point to follow the steps, and the occurrence of staff leaving will undoubtedly affect the production line, and because of the need for efficient and highly skilled staff, companies must

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spend more time training theoretical and practical, the initial investment than general management is higher, once the mature staff resigns, but also the loss of talent.

Agile supply chain (ASC) management is more focused and responsive to different customer needs, aiming to respond quickly to unstable demand and shorter lifecycles, a management that requires high speed of information processing[11], and is thus better suited to the rapid updating IT industry. The ability to detect and adapt to change rapidly and flexibly is the foundation of supply chain agility, and it is also more suited to emerging market settings [12].ASC is a potential supply chain management method that can help businesses stay competitive and outperform their competitors.

DELL uses the Agile model in the process because the Agile solution allows data to be improved in tandem with demand, enabling not only timely changes to the bill of materials but also changes to information related to new products. Time is becoming more precious, wasteful activities are being outsourced, and supply chain adversaries are now competitors in modern companies. The ASC model has helped DELL achieve the dream of a high return on capital with a low cash turnover cycle by replacing inventory with information, giving the company greater flexibility to replace parts and push the envelope, and choosing to outsource as much as possible on parts to achieve lower inventory and focus on core computer needs. ASC allows businesses to remain competitive and outperform.

4. Application of Cloud Computing power

Strengths: Cloud computing satisfies the requirements of the Digital Age. Cloud computing has the potential to minimize the cost of adopting on-premises ERP. The cloud itself can be updated considerably more quickly than local services, making the system more flexible and alleviating the load of calculating massive amounts of data. Remote distribution also simplifies and improves operations. In terms of environmental sustainability, the cloud is more efficient and uses fewer resources than traditional IT infrastructure [13]. It can achieve more imaginative and adaptable solutions by using the Internet to provide servers, storage, databases, software, and so on. It is flexible and adaptive, which can help to minimize operational costs [14].

Opportunities: It is worth noting that the 'DELL's Direct model' is a model of selling PCs directly to customers through DELL without the involvement of retailers. This approach allows DELL to quickly and directly see customer orders and get the latest downstream data on the supply chain. The combination of cloud computing and up-to-date data in large volumes increases the company's competitiveness. DELL considers information sharing to be a fuel for managing supply chain relationships and driving overall performance, and the usage of cloud computing will significantly accelerate information sharing as a key competency for DELL in terms of implementation cost and execution speed. If properly managed, DELL may also produce more granular consumer preference tables using big data analytics, for example, to estimate part production or to prepare for risk by seeing market movements immediately through the most recent information.

Weaknesses: The potential hazards of the information age provide a problem for DELL, which must carefully assess enterprises that outsource services when utilizing cloud computing capabilities., the company should have high credit and high technology to protect data.

Threats: DELL must carefully examine whether to share consumer purchasing preferences, supplier inventory information, and so on with another company.

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