



The Impact of Information Technology on Knowledge Management in the Supply Chain

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Article	Abstract
<p>Article history: Received: 11th July 2021 Received in revised form: 29th July 2021 Accepted: 08th Aug 2021</p> <p>Keywords: Information Technology, Knowledge Management, Supply Chain, Supply Chain Efficiency,</p>	<p>Various advances in I.T. capabilities have changed the face of the industry rapidly over the past decade. Adopting and implementing information technology is one of the methods that applies a distinct competitive personality to companies and the supply chain. Embracing information technology and its efficient implementation can improve cooperation between supply chain members through the rapid transfer and distribution of accurate information and the use of information systems and increase supply chain efficiency. To better understand the issue, a look is taken at the importance and role of information in the supply chain and the supply chain characteristics with the information flow approach. Studies show the impact of information technology on improving accountability, distribution and transmission of information, chain efficiency and enhancing cooperation in both internal and external dimensions, preventing the effect of leather whipping and developing sales channels. Applications of information technology in supply chain management with two technology and information systems approaches are also critical. In addition, studies have shown that factors such as the size of the organization, success rate, uncertainty and pressure of other chain partners, etc., have a significant role in the acceptance of information technology. The use of knowledge management in the supply chain, lack of training for members, and lack of strategic planning significantly impact other barriers.</p>

Introduction

Over the past two decades, managers have witnessed dramatic global change due to advances in global market technology and new political economy conditions. As the number of world-class competitors increased, organizations were forced to rapidly improve the process within the organization to stay on the global competitive scene. In the 1970s, organizations sought to develop detailed market strategies that were customer-focused [1]. They realized that strong engineering and design satisfaction and coherent production operations are prerequisites for meeting market needs and, thus, more significant market share. Therefore, designers were forced to incorporate the ideals and

needs of customers in the design of their products and launch products with the highest possible level of quality, at the lowest cost, along with the ideals desired by the customer [2]. In the 1980s, with increasing diversity in customer-desired patterns, manufacturing organizations became increasingly interested in increasing flexibility in product lines, improving existing products and processes, and developing new products to satisfy customers, which in turn posed unique challenges. He figured it out for them [3].

Established supply organizations and bases and sourcing strategies. In the 1990s, along with improvements in production capabilities, industry executives realized that materials and services received from various suppliers significantly impacted increasing the organization's capabilities to meet customer needs, which in turn had a double effect on focus [4-6]. Managers also found that simply producing a quality product was not enough. Providing products with the customer's desired criteria (when, where, how) and their desired quality and cost created new challenges. In such circumstances, as a conclusion of the mentioned changes, they realized that these changes are not enough to manage their organization in the long run. They had to be involved in managing the network of all the factories and companies that directly and indirectly supplied the inputs of the organization and the network of companies related to the delivery and after-sales service of the product to the customer. With such an attitude, supply chain approaches and supply chain heritage came into play.

Definitions

A supply chain includes all facilities (facilities), tasks, works and activities involved in the production and delivery of a good or service, from suppliers (suppliers and their suppliers) to customers (and their customers). It includes the program Supply and demand management and planning, supply of materials, production and product scheduling, warehousing service, inventory control and distribution, delivery and customer service. Supply chain management coordinates all of these activities to obtain high-quality products and reliable services at a minimal cost. Supply chain management, in turn, can provide the company with a competitive advantage [7-15].

Supplies in the supply chain include factories, warehouses, distribution centres, service centres and retail operations. Goods and services can be delivered by rail, truck, water, air, pipeline, computer, post, telephone, or individual [16]. Tasks within the supply chain include forecasting demand for goods or services, selecting suppliers (sourcing), ordering materials and supplies (procurement), inventory control, production planning, delivery, information management, quality management, and Customer service. Supply chain management is the equivalent of coordinating all of its operations with those of its suppliers and customers [17].

Every business organization is part of one supply chain, and many organizations are part of several supply chains. The number and type of organizations in a supply chain is determined by whether the

supply chain is productive or service-oriented. Most manufacturing facilities are networked with networks of production and distribution locations. One of their tasks is preparing raw materials, turning them into final and intermediate products, and then delivering them to customers. The supply chain management manages these networks. The short-term goal of supply chain management is primarily to increase productivity, reduce inventory and total cycle time. While its long-term goal is to increase customer satisfaction, market share and profits for all organizations involved in the supply chain. Suppliers, distribution centre manufacturers, and customers need strict coordination between organizations involved in the supply chain to achieve these goals. Supply chain management integrates supply chain activities, and related information flows through improved chain relationships to gain a reliable, competitive advantage [18].

Value chain, supply and demand

Supply chains are sometimes referred to as value chains. A term reflects such a concept: As goods and services progress and move forward through the chain, their value increases. Supply or value chains usually involve separate business organizations rather than just one organization [19]. In addition, the supply or value chain for each organization has two parts: a supply part and a demanding part. The supply-side starts from the beginning of the chain (front of the chain) and ends with the organization's internal operations. The supply side of the chain begins when the organization's headquarters is delivered to the immediate customer and ends with the end customer in the chain. The demand chain is the sales and distribution sector in the value chain [20].

The length and size of each segment depending on where a particular organization is in the chain; The organization that is closer to the end customer, the shorter the demand side, and the longer the supply side [21]. Regardless of where they are in the chain, all organizations have to deal with supply and demand issues. Supply chain management aims to connect all parts of the supply chain (supply) so that market demand is met as efficiently and effectively as possible throughout the chain. This requires matching supply and demand at each stage of the chain. Note that organizations in a supply chain are customers and suppliers, except for the primary supplier or suppliers of end customers [22].

Need for supply chain management

In the past, most organizations managed their supply chains less. Instead, they tended to focus on their operations and their immediate suppliers. However, several supply chain management factors are desirable for commercial organizations that actively manage their supply chains [23]. The main factors are:

Need to improve operations: Over the past decade, many organizations have been engaged in activities such as lean manufacturing and total quality management, so they will be able to achieve improved quality while at the same time eliminating a large number of additional costs. Remove from

your system. However, there is still room for improvement. There are now opportunities mainly in supply chain procurement, distribution and support.

Increasing the level of external sourcing: Organizations are increasing their level of external sourcing; It means buying goods and services instead of producing or providing them by the organizations themselves. As the level of outsourcing increases, organizations spend a great deal of time and money on supply-related activities, such as covering, packaging, moving, loading, loading, and tuning.

Value chain supply and demand sections, unrelated activities that may be unnecessary include:

1- Increasing transportation costs: Transportation costs are increasing, and they need to be managed carefully.

2- Competitive pressures: Competitive pressures have been directed towards an increasing number of new products, shorter product creation and development periods, and increasing demand for customization. In addition, adopting fast response strategies and trying to reduce delivery time are among these pressures.

3- Globalization: The expansion of globalization expands the physical length of supply chains.

4 - The growing importance of e-commerce: The growing importance of e-commerce has added new dimensions to business sales and has provided new challenges.

5- Complexity of supply chains: Supply chains are complex; They are dynamic and have many inherent uncertainties that can adversely affect the supply chain, such as incorrect forecasts, late deliveries, substandard quality, equipment malfunctions, and altered or cancelled orders.

6. The need to manage inventories: Inventories and the success and failure of a supply chain play a significant role in coordinating inventory levels throughout the supply chain. Deficiencies can disrupt the timely flow of work and affairs and adversely affect supply chain performance, while excess inventory increases unnecessary costs. It is not uncommon to have a shortage of inventory in one part of the supply chain and excess inventory in another [24].

Effective management resources

Effective supply chain management offers countless benefits. For example, CAMPBELL SOUP doubled its inventory turnover rate, HEWLETT PACKARD reduced desk printer supply costs by up to 75%, SPORT OBERMEYE doubled its profit, and sales increased up to 60% in two years. And NATIONAL BYCICLE increased its market share from 5% to 29%. Effective supply chain management also helped Wal-Mart become the world's largest and most profitable retailer. The benefits of effective supply chain management generally include lower inventories, lower costs, higher productivity, improved ability to

respond to demand fluctuations, shorter delivery times, higher profits, and greater customer loyalty [25].

Supply Chain Management Elements

The first element, the customers, is the motivating element. Usually, marketing is to determine what customers want and track the amount and time of customer demand. Product and service design is tailored to customer needs with capabilities and operational capabilities. Processing is done in every part of the supply chain is the central focus of any organization. Much of the processing takes place in the organization that produces the product or service for the end customer. A significant aspect of this part is a supply chain schedule for both internal and external departments [26].

Inventory in most supply chains is a crucial factor. The main goal is to balance the inventory level. Too much inventory disrupts and delays the schedule, and too much inventory adds to unnecessary costs. Purchasing is the link between an organization and its suppliers. This task is to obtain goods or services used to produce products or provide services to customers of the organization. Purchasing selects suppliers, negotiates contracts, forms alliances, and acts as a link between suppliers and various domestic divisions [27].

Purchasing has become increasingly crucial in supply chain management. Several factors contribute to this:

Increased outsourcing: The point is that the cost of materials and supplies is much higher than the cost of labour. Increased conversion to lean manufacturing and JIT requirements, which means smaller batch size, the need for accurate delivery schedules, quality and higher, and actual and complete values.

Increasing globalization: The supply chain of a supply chain (value) consists of one or more suppliers, all of which are interconnected in the chain. Each can influence the effectiveness or ineffectiveness of the supply chain. In addition, it is essential that planning and implementation are carefully coordinated between suppliers and all members of their demand side.

Proximity to the market or proximity to sources of supply, or proximity to both may be possible. In quality management (TQM) refers to benchmarking, i.e. evaluating the position that the company has now contracted and using it to The title is a guide to the position the company wants to be in the future [27]. However, a company must evaluate performance and set overall goals for the entire supply chain, not just the company alone. A company may set high goals for itself to minimize inventory but at supply levels. The company's suppliers need to be increased to achieve its local goals regardless of supplier costs. High inventory costs for the company are considered as higher parts delivery costs and material costs. Achieve its quality goals and ignore the quality plans of its suppliers, then it will adversely affect

its quality. Therefore, the supply chain should be designed to minimize inventory and provide high quality among both suppliers. Achieve among customers.

This level of interdependence and interrelationships and the common goal raises the issue of supplier selection (SOURCING), which is called PROCUREMENT. The purchasing, procurement, and procurement of materials, parts, and services are called a decision. Suppliers must be reliable in terms of quality, time frame and quantity. McDonald's expects to receive its combined food components from the supplier two days after ordering. Combined food delivery delay from the supplier two days after ordering. Suppliers' delays are often due to disruptions and delays in the process. Materials for the production process lead; too many suppliers can be challenging to coordinate and control; also a small number of suppliers can be risky if they are unreliable and can reduce the company's competitiveness, supply customers must also be customer-oriented and act with the same goals and the exact quality expectations. To achieve its strategic goals, it must control the supply chain destruction factor we mentioned earlier, namely uncertainty. This requires identifying and understanding the causes of uncertainty, determining how uncertainty affects other activities at the top and bottom of the supply chain and then setting up procedures and methods to reduce or eliminate it. Also, delivery time and cost are usually affected by location, and LOGISTICS includes material handling and storage [28].

Strategic, tactical and operational issues

Since a company's supply chain includes all the tasks and operational facilities of the company, its design is necessarily a complete part of the company's strategic planning process. For most companies, the strategic plan's goals are the same as the goals of supply chain management—active and reliable delivery of high-quality goods and services at the lowest cost. Doing so requires strategic design decisions that effectively coordinate all supply chain tasks. It is not surprising that many of the same strategic design considerations for a quality management plan can be applied to supply chain design. A significant part of the process of strategic planning is the determination of the goal or goals. In chain management, it is the goal or goals. Before plans are set and determined in supply chain management, it is essential to know the current performance and what is necessary after improvement or re-engineering. A valuable tool for identifying and reducing uncertainty is strategically applying the principles of total quality management, including statistical process control throughout the supply chain [29].

This means that suppliers use comprehensive quality management to ensure the quality of products delivered to customers on time, DISTRIBUTOR CENTER, total quality management to ensure that products are timely and error-free they process, package, move and ship, and send shippers products safely and in the right place at the right time. Another strategically important aspect is in the design of the supply chain and the flow of information. Allows suppliers, customers, distribution centres, and shippers to communicate almost instantly, thus enhancing the ability to coordinate these different

supply chain tasks. Computerized POINT OF SALE information can be simultaneously and quickly transferred to distribution centres through communication networks, and shippers can deliver promptly to customers and replenish inventory through suppliers. If everyone with the same supply chain simultaneously, Similar to Achievement, this enables them to coordinate precisely and thus reduces uncertainty, which in turn allows them to reduce inventory levels [30].

The types and number of facilities built (or acquired) and where they are placed are among the strategic design issues of the supply chain. Because transportation and distribution costs can make up a significant portion of supply chain costs, decisions about facilities and their location are costly and long-term commitments, as are those decisions, other design decisions such as which suppliers dictate the process, method of transportation, distribution centres, and customer markets. For example, 75% of Honda suppliers are located 150 miles from the Ohio, Wirespool plant. Wal-Mart is an example of this. Wal-Mart's competitive strategy is to supply quality goods to our customers when and where they want and at a competitive price [31].

The key to achieving these strategic goals is the CROSS DOCKING feature of the supply chain design: Goods arriving at a warehouse from one supplier are loaded from the supplier truck and loaded into outbound or outbound trucks, which avoids storage and warehousing.

In the CROSSDOCKING system, products are delivered to Walmart warehouses continuously and distributed to stores without being in stock. Goods pass from one dock load to another dock in 48 hours or less. The system allows Walmart to buy full-loaded trucks while also avoiding relocation and inventory costs. In the sales process, prices have fallen by two to three per cent, below the industry average. Wal-Mart then transfers these cost savings to its customers at low prices. Low prices enable them to avoid frequent high discounts to keep prices stable, making sales more predictable and thus reducing excess inventory for extensive inventories.

Not all retailers use the OTC system because it is challenging to coordinate and manage. To do this, Wal-Mart has invested heavily in an integrated support system to keep in touch with all Walmart suppliers and distribution centres. Each point of sale in each store sends point-of-sale (bar code) data directly to 4,000 Wal-Mart suppliers via a satellite communications system. In addition, Walmart has 2,000 trucks to serve its 19 distribution centres. This allows the company to ship goods from warehouses to stores within 48 hours, and store cages are stocked and refilled on average twice a week, compared to the industry average of once every two weeks. Requires close management cooperation at all levels. Store managers are connected and company executives through a video connection that enables the continuous exchange of information about products, pricing, sales and promotions. Based on the above, strategic, tactical issues can be discussed. And categorized supply chain operations as follows: Strategic issues Strategic decisions generally have a long-term effect on the supply chain. The main strategic issue is supply chain design. It includes determining the number, location and capacity of

facilities. Topics may include topics such as construction or procurement; strategic alliances; as organizations reduce their suppliers, these alliances expand as the number of suppliers in organizations decreases. Organizations have an effect that suppliers can have on costs. In addition, such alliances empower customers to free up some resources, and suppliers benefit from long-term relationships to have less to worry about competition. Sharing data is beneficial because it improves planning and scheduling [32].

Tactical issues: Tactical issues include policies related to areas such as inventory, procurement, processing, support, and quality. They are guided by their strategy and instead guide operational decisions. Operational issues: Important operational issues in supply chain management are related to production planning and control, delivery schedule of goods and services, and manufacturing or purchasing decisions to the extent that they are relevant to this level [33].

Purchasing or manufacturing decisions affect the nature and realm of supply chains. An organization can control the internal part of the supply chain relative to the external sector and therefore make improvements. Consider the title of one of the shopping websites. Operations planning and control include internal activities related to scheduling, setting orders delivery dates, and moving materials within the facility from receiving deliveries from suppliers, to inward processing to packing and shipping outgoing goods [34].

Intra-functional coordination

Exchanging one cost over another has been at the heart of product flow management since the early 1960s; optimizing conflicting product flow activities has been a principal cost-cutting coordinator for many years. It was common for companies in the 1960s. To spend 15 to 30 per cent of its sales on product flow activities, today the average percentage is about eight per cent. It was found that cost inconsistency between shipping and inventory, production or purchase and inventory and shipping, and transportation. Because these areas are often under the direct control of the product flow manager, cost exchanges are quickly evaluated and optimized. This type of management continues because it is central to controlling the cost of goods. Notice how the chain channel decides, which is entirely within the control of the support task [35].

Inter-functional coordination

A few years ago, STOLLE showed that managing support activities includes other tasks within the company, namely marketing, finance, and manufacturing. Facility and order processing (achieving goals adversely affects other performance areas. Modifying a support activity may lower support costs but has the opposite purpose of maximizing marketing revenue). Low-cost but low-cost transportation service at the cost of poor customer service and low income (goal to minimize capital requirements in the financial sector). Add large warehouses with lower direct support costs but increase investment

(Minimizing the cost per unit of production (selecting small, consecutive deliveries may compel production in small but expensive TOTSIZE categories) to balance the impact of change in these other functional areas to benefit the company as a whole. Control remains with the company, but it is beyond the scope of support [36].

Inter-organizational coordination

Coordinating product flows across multiple institutions is an area that provides new opportunities to improve service costs. This is now a good opportunity for researchers to model flows and identify opportunities for improvement across the channel. It cannot be achieved through each channel member acting independently to optimize its cost structure. Once potential benefits in the supply chain have been identified, the product flow manager needs to turn opportunities into tangible benefits. In some cases, the work is evident, and some variables need to be easily adjusted. The result is that all channel members benefit. In other cases, it takes time to reach the boundaries across the coordination body. However, if the benefits of coordination and cooperation belong to all sectors. The coalition is likely to remain, and the benefits continue. Similarly, if cooperation in one industry that benefits is at the expense of others, the alliance is expected to falter [37].

New competition

Supply chain management represents a paradigm shift that increases the firm's enthusiasm for the concepts of collaboration and competition. COOPERATION does not seem to be a process between a set of exchanging partners. Cooperation now exists throughout the supply chain. The basic premise of the new competition is that companies will not compete as long as they used to. Now the new global network competition is centred on agile companies with actively seeking change and different interpretations of events. They are inclusive and eager to think differently about their business and respond quickly to market changes [38].

From collaboration to sharing efforts

Without requirements, there will be new competition, drastic changes between business partners. Our partnership in which companies exchange some essential information and use some long-term contracts or supplier/customer contacts Threshold level of engagement that is, collaboration is the starting point in supply chain management and is a necessary but insufficient condition. The next level is coordination, whereby both workflow and information are exchanged so that EDI, JIT, and other systems are involved. Businesses can work together to coordinate some activities, but they do not yet act as real partners. They seek to integrate many traditional relationships between and within the business sector. Again, this evolution is a necessary but insufficient condition for supply chain management [39].

Supply chain management is built on trust and commitment. The consensus is that trust and confidence can significantly contribute to the long-term stability of an organization. Trust is expressed by faith, reliance, belief, or trust in the supply partner, and the company's supply chain partner will act consistently with the supply chain management (SCM) strategy and what the company says it will do, the partner will do. Give. Commitment is the commitment that business partners are willing to devote to maintaining this energy relationship. Through the commitment of committed partners, resources are allocated to support and advance supply chain goals. And share plans, as well as information about the competitive forces and R.D. partners who have recognized that their long-term success depends on the strength of their weakest supply chain partner. Relationships that are strategically important and complex and must be worked out jointly to manage the supply chain. Complexity can be financial, like an essential monetary commitment [40].

Conclusion

The supply chain includes all activities related to the flow and exchange of goods and services, from the raw material stage to the final product stage that the customer can consume. In addition to material flows, these transfers also include information and financial flows. In short, supply chain management consists of three main parts: procurement, production and distribution. Also, for supply chain management, three types of management should be done: information management; Logistics management (support), relations management. This issue was fully introduced in this series because a complete description of this issue was not possible in this series, so an attempt was made to examine various aspects of the issue that can be a way for further studies.

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