

Investigating the Trends and Challenges in the Supply Chain and How it is Impacted by the Digital Revolution

Harsh Agrawal, Parth Gupta, Rahul Agrawal

Management, Christ (Deemed to be University), India

Management, Christ (Deemed to be University), India

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Abstract: This paper investigates the relationships between Supply Chain Management (SCM) practices and technological advancement in a R&D manufacturing setting. The results revealed that the current trends in supply chain have positive and significant relationships with information technology and digital revolution; here we saw how current trends of the firms regarding SCM are changing with changes in technology and its use. Findings show that through proper implementation of technological innovation, firms are able to achieve better supply chain practices. Finding shows how technological advancement is helping in making supply chain more efficient. These findings are useful for decision-makers when formulating SCM strategies and focusing on practices that will help them achieve greater technological innovation and will provide them competitive advantage over other firms.

INDEX TERMS: Supply Chain Management, Information Technology, Trends, Technological Advancements.

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I. Introduction

In 1982, Keith Oliver, a consultant at Booz Allen Hamilton, during an interview for the Financial Times, introduced the term "supply chain management" to the public domain. A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. Supply chains exist in both administration and assembling associations, despite the fact that the unpredictability of the chain may shift significantly from industry to industry and firm to firm.

A supply chain for a single product, where raw material is procured from vendors, transformed into finished goods in a single step, and then transported to distribution centres, and ultimately, customers. Realistic supply chains have multiple end products with shared components, facilities and capacities. The progression of materials isn't generally along an arborescent system, different methods of transportation might be considered, and the bill of materials for the end things might be both profound and enormous.

With respect to our topic regarding how I.T sector impacts the supply chain we can say that new technology is transforming daily business processes for many in supply chain management. The need for real-time tracking and accurate delivery systems makes supply chain management ripe for technological innovation- and mobile, wireless, handheld technology is leading the way throughout the logistics and transportation sectors. With the regularly changing part of innovation, staying aware of new capacities and best practices can be hard for enormous organizations that have profound interests in more seasoned innovation- it is an endless procedure. Despite the fact that changes require significant investment, utilizing new advances is the key in this aggressive, dynamic or ever-changing industry.

II. Objective of the Study

This study has been carried out to know the current market trends of supply chain management, the challenges faced by them in day to day operations. The paper will also evaluate the impact of changing technology on the existing and traditional trends followed in supply chain management and will provide some solutions to turn challenges into opportunities with the help of technology.

III. Trends in Supply Chain Management

Demand Planning Begins at the End of the Cycle

As sources and capacities with respect to assembling have expanded, more organizations have moved away from concentrating endeavours on plant-level generation arranging and are embracing to a greater degree a demand driven focal point of attempting to impact and oversee request all the more effectively. Supporting what your organization is best at selling, making and conveying, and adjusting the business power with that outlook,

is basic to embracing a demand driven model. The demand driven methodology can enable an organization to make a more client centred attitude, without giving up operational proficiency. At last, a demand centred way to deal with arranging can altogether improve demand planning and the executives endeavours and help by and large expenses and client administration endeavours.

Advanced demand planning systems and proper strategies can also help uncover data and identify trends buried in a company's information systems. Companies should conduct an enterprise-wide internal Demand Review to gather information from all aspects of the organization. Goals are then set to gain consensus on what will be sold each month for each product line or category and the resulting revenue. Obviously, the driver of the Demand Review procedure is consistent improvement of estimate precision.

Demand planning is a key contribution to the bigger deals and tasks arranging (S&OP) process and can have a critical positive effect on new item presentations, stock arranging and the executives, client administration, supply arranging effectiveness and sourcing methodologies. Demand planning achievement is frequently attached to organisational structure. Organizations with committed assets centred around demand arranging and gauging yield more grounded outcomes and drive more an incentive to their organization. Organisations that emphasis low maintenance on demand arranging and anticipating endeavour, be that as it may, regularly yield inadequate outcomes. With the key significance of demand arranging, organizations should be focused on this from both an asset and innovation point of view.

Globalization

The business scene is quickly winding up increasingly worldwide. To a great extent because of enhancements in interchanges, globalization is significantly affecting the manner in which business is overseen and executed, even on the most nearby levels. No territory of a business is progressively influenced by the pattern to a worldwide business condition than the inventory network. Assembling, circulation, sourcing of materials, invoicing and returns have all been essentially affected by the expanded coordination of a worldwide client and provider base, and numerous organizations locate that current procedures and innovation are not adaptable enough for this new business condition.

For example, historically, many companies have brought in container shipments from Asia Pacific through the ports in southern California. As the volume of container shipments has increased, all of these ports have experienced capacity issues relating to customs clearance and transshipping. As a result, some companies are contemplating rerouting these inbound shipments to alternate ports. This change may seem subtle, but a shift in logistics of this magnitude has far-reaching effects on the overall cost and efficiency of the supply chain network. Dynamically repositioning the point of entry for inbound container shipments can have a positive impact on customs clearance times and access to increased transportation capacity, however, there can be a negative impact as well. Better understanding the total landed cost and service implications of alternate ports of entry can help improve supply chain costs and performance.

The correct supply chain design is basic to dealing with the progressions realized by quick globalization. An all-around idea out supply chain network configuration can streamline the production network organize and the progression of materials through the system. In doing as such, organize configuration catches the expenses of the supply chain with an "all out landed cost" point of view and applies progressed numerical innovation to decide ideal responses to both vital and strategic inquiries.

Increased Competition and Price Pressures

Historically, price, product features and brand recognition acknowledgment were sufficient to separate numerous items in the commercial centre. With the proceeded with commoditization of numerous items, organizations need better approaches to separate themselves. In one case, an enormous worldwide shopper merchandise maker saw costs around a portion of its item items drop as much as 60 to 80 percent. Item development and brand value never again enabled them to direction a more expensive rate in the market. So as to keep on rivalling that commoditized item the firm made critical cost upgrades with supply chain redesign and technology.

Organizations are looking to their supply fastens in two different ways to help counterbalance this pattern. In the first place, they are seeing approaches to diminish cost and are making a productive value chain to remain cost focused. Second, organizations are taking a gander at ways they can offer some benefit added administrations to fulfil the needs of increasingly refined clients.

Organizations ought not just look to their supply chain to drive cost improvement, yet should build capacities as a method for remaining focused. Streamlining forms with better plan, better cooperation crosswise over systems and new administrations will enable your organization to remain focused and fortify organisations with your clients.

Outsourcing

The same number of organizations venture back and analyse their centre skills some understand that redistributing parts or the majority of a supply chain can be invaluable. With marketplace improvements around (1) information mediums and systems (2) cost and quality of global manufacturing and distribution and (3) product design capabilities companies are gaining additional synergies by outsourcing all or parts of their supply chain.

There can be critical economic advantages from redistributing all or part of your supply chain activity, yet without the correct frameworks, forms or authoritative administration structure the hazard to progress can increment to alarming levels. In a redistribute overwhelming condition, organizations need to set up more controls and frameworks to make up for the way that the inventory network abilities never again dwell nearby. In an outsourced supply chain environment, the requirement for data, controls and magnificence from the data specialist turns into a high need.

The optimally outsourced supply chain, either in its entirety or just a component, relies heavily on:

- superior supply chain network design
- inclusion of that outsource partner in the information chain
- establishment of control mechanisms to proactively monitor the various components of the supply chain
- information systems to connect and coordinate the supply chain as seamlessly as possible

Product Life Cycles

Today numerous organizations are feeling the squeeze to create innovative items and put up them for sale to the public all the more quickly while limiting cannibalization of existing items, which are still in extreme demand. So as to address the issues of the two clients and shoppers, organizations need increasingly effective item lifecycle the board forms. This incorporates substantial accentuation on overseeing new item presentation, item suspension, plan for manufacturability and utilizing over their whole item and framework qualities.

One main advantage of Product Lifecycle Management (PLM) procedures and innovation is helping organizations structure items that can share basic activities, parts or materials with different items, along these lines diminishing dangers of obsolete write offs, expanding cost influence on the acquiring of key materials and guaranteeing that framework ventures are ideally used. Moreover, getting this correct will improve your opportunity to advertise. By centring product lifecycle the board endeavours in these territories, an organization can cradle itself against the danger of a spontaneous cost increment, a poor new item dispatch, an impromptu oldness discount and can improve the general client view of the organization as a successful trend-setter.

Thus, the organization expanded parts re-use, improved record recovery time, decreased plan process duration and eventually diminished new item advancement cost by 15 percent. These enhancements helped the organization develop income by 25 percent, for the most part from an expanded pace of item presentations.

As the economy turns out to be progressively worldwide, marking and consistence to bundling necessities and guidelines have turned out to be basic to progress. Without adherence to neighbourhood bundling and naming guidelines an item may abuse nearby necessities, keeping it from being conveyed and sold in that showcase. Product Lifecycle Management's innovation procedures can help guarantee that items being delivered and focused for explicit markets are well-overseen and are consistent. Item lifecycle the board apparatuses and procedures have helped purchaser merchandise organizations with their endeavours to attempt to constantly drive request through bundling and marking advancement and structure. Usage of an ideal PLM procedure and innovation can permit a buyer merchandise organization to successfully deliver and appropriate items that are focused for territorial advancements or customer inclinations.

IV. Major Challenges in Supply Chain Industry

1. Quality Customer Service

The store network the board is unified on the requirements of the clients. It is tied in with giving the correct amount and the correct nature of the item for the appropriate measure of cash. All this should be in flawless planning and setting.

2. Costing

Speaking on a global note, the expenses of raw materials, energy and labor work have expanded because of practical limitations. With the goal for activities to proceed with creation and give clients great quality things at reasonable rates, modifications must be made to keep tasks running.

3. Risk Management

Because of the steady change in the market, originating from an assortment of sources, for example, buyer requests, political plans and worldwide sourcing would make serious issues the tasks.

4. Supplier Relationship

By making a commonly solid and amicable association with your accomplices or providers, you will almost certainly give your clients results of exclusive requirements in an opportune way. This likewise enables you to make and open doors for development in terms of execution of plan.

5. Qualified Personnel

Throughout the years, it has turned into a test to discover ability intrigued and energetic about this profession. Work force contracted in this field must have a comprehension about the obligations and duties required.

6. Unforeseen Delays

Acquisition of materials and items might be simple; however the conveyance may not generally be 100% on schedule, particularly with time contrasts and an assortment of transportation time periods. At the point when things are sourced from various nations, postpones like this are extremely normal.

7. Fast-Changing Markets

With mechanical progressions changing our business sectors regularly, it is very hard to remain in pace and adjust to the assortment of developments in the market. But since the objective is to remain proficient in these evolving times, organizations would need to be progressively adaptable.

V. Solutions for major challenges in Supply Chain Management

- **Quality Customer Service**

It may appear to be simple, yet despite what might be expected, it isn't. Clients have various inclinations and we need to consistently acclimate to the client's needs. Having the option to give clients remarkable arrangements have the effect altogether. Organizations that really exceed expectations in this field are the ones that try to learn and put resources into new advancements.

- **Costing**

The best answer for this issue would improve your cost control by executing your arrangements productively through consistent observing. Through endeavours in giving distribution centre productivity you would most likely do as such.

- **Risk Management**

Always be set up with a hazard the executives plan, on how your organization will almost certainly conquer disturbances over the span of tasks. By enlisting a logistics software development organization you would most likely deal with these issues viably with less exertion on your end. All things considered, logistics management is crucial to the whole activity.

- **Supplier Relationship**

By structuring a solid working association with your supplier, you would almost certainly work effectively and think of a superior yield in a brief timeframe.

- **Qualified Personnel**

Since finding devoted faculty to work for this field has turned out to be expanding hard to discover, their fairly estimated worth will begin to rise. Contracting and advancing through in-house staff would be the most reasonable arrangement now.

- **Unforeseen Delays**

Always have cradle stocks. Through a productive distribution center administration framework you can know when you need certain materials conveyed just as make a period as far as conveyance to ensure everything runs easily.

- **Fast-Changing Markets**

Change is unavoidable. The manner in which we adjust to change is certainly something we have to oversee by utilizing logistics management software. We can move with the stream and improve our overall productivity.

VI. Digital Revolution

The Digital Revolution, is the shift from mechanical and analogue electronic to digital electronic which began anywhere from the late 1950s to the late 1970s with the adoption and proliferation of digital computers and digital record keeping that continues to the present day. Implicitly, the term also refers to the sweeping changes brought about by digital computing and communication technology during (and after) the latter half of the 20th century. Analogous to the agricultural revolution and industrial revolution, the Digital Revolution marked the beginning of the information age.

Digital Revolution and Supply Chain

It states how a firm adopts digitalisation and changes its supply chain accordingly. The transformation into a digital supply chain requires two key enablers - capabilities and environment. Capabilities regarding digitization need to be built in the organization typically also require targeted recruiting of specialist profiles. The second key prerequisite is the implementation of a two-speed architecture/ organization. This means that

while the organization and IT landscape are established, an innovation environment with a start-up culture has to be created. This "incubator" needs to provide a high degree of organizational freedom and flexibility as well as state-of-the-art IT systems to enable rapid cycles of development, testing, and implementation of solutions. Fast realization of pilots is essential to get immediate business feedback on suitability and impact of the solutions, to create excitement and trust in innovations (e.g., new planning algorithms), and to steer next development cycles. The "incubator" is the seed of Digital Supply Chain in the organization - fast, flexible, and efficient.

VII. Impact of Information Technology (I.T) in supply chain

Organizations that select to partake in supply chain management activities acknowledge a particular job to perform. They have a shared inclination that they, alongside all other production network members, will be in an ideal situation as a result of this community-oriented exertion. The basic issue here is power. The most recent two decades have seen the moving of market power from that of manufacturers to retailers. When we talk about data or information access for the inventory network, retailers have a fundamental assignment. They rise to the situation of conspicuousness with the assistance or help or use of technologies. The headway of organizational information system for the supply chain has three particular advantages. These are:-

- Reduction of Costs- The headway of innovation has additionally prompted prepared accessibility of the considerable number of items with various offers and discounts. This prompts decrease of expenses or cost of goods and services.
- Productivity- The development of I.T. has improved profitability on account of creations of new devices and programming. That makes productivity a lot simpler and less tedious.
- Improvement and market strategies- Recent years have seen an enormous development in the technologies as well as the market itself. New systems are made to charm clients and new ideas are being tested for improving the item.

It is proper to state that information technology is a fundamental organ of supply chain management. With the progression of technology in the global market across all sectors, new items are being presented in a very short-period of time expanding their interest in the market.

The software as well as the hardware part needs to be considered in the advancement and maintenance of supply chain information systems. The hardware part comprises computer's input/output devices like the screen, printer & mouse and storage media. The software part comprises the entire system and application program used for processing transactions management control, decision-making and strategic planning.

Here we will be discussing the role of I.T. in SCM. These are briefed below-

- Electronic Commerce

Electronic trade includes the wide scope of tools and methods used to direct business in a paperless environment. Thus, it includes electronic data interchange, e-mail, electronic fund transfers, electronic publishing, image processing, electronic bulletin boards and shared databases. E-commerce helps businesses to computerize the way towards recording archives, information and data electronically among suppliers and consumers, in this manner making the correspondence procedure much simpler, less expensive and fast.

- Electronic Data Interchange

Electronic Data Interchange (E.D.I) includes the swapping of business reports in a standard configuration from PC to-PC.

It exhibits the capacity just as the act of trading data between two organizations electronically instead of the conventional type of mail, courier, and fax.

The advantages of E.D.I are the following-

- Instant processing of information
- Improvised customer service
- Limited paper work
- High productivity

The use of EDI inventory network accomplices can conquer the deformation and falsehood in free market activity by redesigning advancements to help continuous sharing of genuine interest and supply data.

- Data Warehouse

Data warehouse can be defined as a store comprising all the databases. It is a centralized database that is prolonged independently from the production system database of a company. Numerous organizations keep up different databases. Rather than some specific business forms, it is set up around enlightening subjects. The information present in data warehouses is time subordinate and effectively available. Authentic information may likewise can also be collected in data warehouse.

- Enterprise Resource Planning tools

The ERP framework has now turned into the base of numerous IT foundations. Some of the ERP tools are Baan, SAP and PeopleSoft. ERP framework has now turned into the handling instrument of numerous organizations. They grab the information and limit the manual exercises and errands identified with handling money related, stock and customer order information. ERP framework holds an abnormal state of incorporation that is accomplished through the best possible application of a single data model, improving common comprehension of what the mutual information speaks to and building a set of guidelines for accessing the data.

With the advancement of technology, we can say that world is shrinking day by day. Similarly, customers' expectations are increasing. Also companies are being more prone to uncertain environment. In this running market, a company can only sustain if it accepts the fact that their conventional supply chain integration needs to be expanded beyond their peripheries. The strategic and technological interventions in supply chain have a huge effect in predicting the buy and sell features of a company. A company should try to use the potential of the internet to the maximum level through clear vision, strong planning and technical insight. This is essential for better supply chain management and also for improved competitiveness.

We can perceive how Internet innovation, World Wide Web, electronic trade and so on have changed the manner by which an organization did business. These organizations must recognize the intensity of innovation in technologies to cooperate with their stakeholders. We can in reality state that IT has propelled another type of SCM application. The Internet and other systems administration connections gain from the exhibition previously and watch the authentic patterns so as to recognize how much item ought to be made alongside the best and financially sound strategies for warehousing it or transporting it to the retailer.

VIII. Limitations of IT in Supply Chain

Technologies may have high capital expenses and, contingent upon the size of the firm, these speculations may not be achievable. For instance, RFID technology has breaking points to its presentation. As indicated by Welt (2003), absence of equipment interoperability has been a noteworthy constraining component for RFID usage. Certain items, for example, liquid can interfere with the transmission of the electromagnetic waves to the terminals and result in a "terrible read" of the information. Likewise, GPS can have issues with the transmission and receiving of the satellite signal. On the off chance that the signal is disturbed, the location of the product in the transit will be unknown. The precision of that signal may likewise be being referred to. GPS may just have the option to follow an item's area to inside a specific range in spite of late advancements in GPS innovation that have made this less of an issue.

Information technology has constraints also. Older Generations may have a troublesome time changing in accordance with more up to date measures and applications, while more youthful people may discover the utilization of these innovations a lot simpler. Information Technology additionally requires the ability of people who are prepared to comprehend the complexities of the framework so as to keep up and investigate it. This requires some time, energy, and time. Firms need to compute and decide whether the advantages exceed the expenses of regulating such a framework. Depending upon the kind of framework, protection might be an issue. With the ascent of the Internet and the data age, dangers of stolen data are a genuine hazard.

IX. Conclusion

As investigating the trends and challenges in the supply chain industry and the impact of digital revolution in it, we can say that with everything going digital each passing day, new trends have emerged in supply chain while the challenges earlier have been overcome and the new challenges have come up. New trends such as demand planning at the end of product, outsourcing and improved life-cycles of the products have emerged in the industry. Demand planning at the end has put an end to the unnecessary buffer stock; outsourcing helps a company focus on its core activities while life cycles of the products are now easy-to-forecast, helps in taking crucial decisions and gaining competitive advantage. The major challenges which earlier seemed to be inevitable such as- risk, costing and the dynamic market, can be controlled now. With the help of technology, forecasting of demand can be done which removes risk; companies are now able to reduce the costs of the products while providing good quality products and in today's ever-dynamic market, organizations are now able to change accordingly and can face the unknown challenges more valiantly.

Now, the question remains how we can make the best use of technology while making activities more efficient and effective so that the benefits of technology are received to even greater number of people and similarly new trends emerge in the supply chain industry.

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