



A Review paper to understand the concept of Big Data in Supply Chain Management

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ABSTRACT: The tremendous impact of e-commerce on conventional brick-and-mortar stores is just one illustration of the data-driven revolution sweeping numerous sectors and business processes today. Few firms, however, have been able to use the "big analytics" approaches that might alter the way they design and manage their supply chains to the same extent. As Big Data, IoT, and machine learning become increasingly prevalent, industries of all sizes are catching on. However, some firms are slower to adapt than others, despite the fact that the benefits of big data are clear.

Key Words: Big Data, Supply Chain, Impact, Management, SCM.

I. INTRODUCTION

The tremendous impact of e-commerce on conventional brick-and-mortar stores is just one illustration of the data-driven revolution sweeping numerous sectors and business processes today. Few firms, however, have been able to use the "big analytics" approaches that might alter the way they design and manage their supply chains to the same extent. As Big Data, IoT, and machine learning become increasingly prevalent, industries of all sizes are catching on. However, some firms are slower to adapt than others, despite the fact that the benefits of big data are clear.

Two key challenges, in our view, limit the full effect of big data on the supply chain. First and foremost, there is a shortage of competencies. Even those with a high level of technical competence, supply chain managers have little or no familiarity with the data analysis methodologies employed by data scientists. As a result, they frequently lack the vision to realize what big data analytics can do. Second (and probably more importantly), most businesses lack a defined strategy for exploring, evaluating, and capitalizing on big data opportunities in their supply chains.

Big supply chain analytics makes use of data and quantitative approaches to better decision making across the supply chain. It accomplishes two things in particular that are novel. For starters, it broadens the dataset for analysis beyond the typical internal data kept on ERP and SCM systems. Second, it employs sophisticated statistical techniques on both new and old data sources. This generates fresh insights that aid in supply chain decision-making, from improving front-line operations to strategic decisions such as selecting the best supply chain operating models.

Only 17% of top executives have made progress in integrating big data and related technology into their supply chain management system in 2014. It is now believed that the figure has risen to slightly about 50%. Furthermore, study suggests that the more a firm spent in this sort of technology, the higher the pay-off.

2. Impact of Big Data on Supply Chain Management:

While the goals of supply chain management (SCM) include cost savings, increased productivity, and timely and safe delivery of products and services, the existence of many manufacturers, vendors, distributors, and channels only adds to the complexity. This makes data collecting and analysis difficult, even for a large business with vast resources.

Big data analytics, on the other hand, can offer the correct answers and, in the end, simplify procedures. Big data is meant to be compounding, which means that data produced and used in one application may readily cross over into another. Furthermore, the greater the number of data sources accessible, the more accurate the forecasts and the better the results.

1. **Inventory Forecasts:** Businesses must be able to capitalize on opportunities as soon as they arise. Predicting sales patterns and inventory changes, on the other hand, need a wealth of data and sophisticated predictive analytics. Big data analytics may have helped to avert this disaster — as well as other, minor sales swings. Big data combines historical sales patterns with predictive technologies to offer inventory managers with estimates of how much to expect. This substantially reduces expenses, allowing the supply chain to purchase enough goods to populate the shelves without purchasing too much and perhaps squandering products.
2. **Temperature Control and Product Quality:** Many sectors, including food, agriculture, pharmaceuticals, and chemical processing chains, require tight monitoring and control of certain supply chain aspects. Even a few degrees of temperature fluctuation might have an influence on the product's quality - or even render it entirely useless. The approach is cold chain monitoring technology, which uses data logging to assist temperaturesensitive product logistics. Temperature changes may be monitored in real time by managers, who can then modify cooling or heating systems during packaging, shipping, and delivery. Big data platforms can also aid in the prevention of possible interruptions caused by varying data, such as weather fluctuations or traffic delays. This results in a complete control system that allows for successful supply management from beginning to end, while decreasing waste and preventing product problems.
3. **Order Processing and Real-Time Tracking:** Order fulfillment and traceability must be efficient for both corporate efficiency and customer pleasure. Amazon has altered the game by providing extremely fast delivery timeframes, as well as warnings for expected drop-off timings and minute-by-minute tracking. Big data can enable organizations of all sizes to provide similar experiences to their consumers and clients. By optimizing route deployment, delivery timetables, and item placement, up-to-date shipping information may also assist to save expenses with delivery fleet management. UPS employs supply chain data analysis at every stage of the delivery process. As shipments move through the supply chain, radars and sensors collect data. The routes of the deliverers are then optimized using big data technologies to guarantee that items reach on time. Overall, this has helped UPS save 1.6 million gallons of fuel in their vehicles each year, considerably lowering delivery costs.
4. **Big Data Maintains the Supply Chain:** Integrating big data technologies into every step of the supply chain management process may provide incredible outcomes. Supply chain managers can now have the tools they

need for strategic decision-making by integrating comprehensive data sets with predictive analytics and IoT. Although investing in big data might be frightening, the benefits greatly exceed the costs for companies of all sizes. There is little question that organizations will continue to invest in and rely on big data technologies in the foreseeable future.

5. **Consumer Trends and Usage Patterns:** Leading telecommunications companies are aggressively investing in big data analytics to study their customers' use trends and behaviours. The data obtained from the analytics report helps organizations to retain subscribers while dramatically increasing income.

3. Conclusion:

Big data is having an influence on many aspects of the supply chain. It includes anything from shortening delivery times to finding strategies to bridge the communication gap between manufacturers and suppliers. Analytics reports help decision-makers to enhance operational efficiency and performance monitoring in order to increase productivity. Traceability of products is critical to the effectiveness of supply chain operations. Using barcode scanners and connecting radio frequency identification devices to specific items, supply chain managers may quickly trace a product. Big data analytics allows firms to collect precise product information, allowing operators to keep on top of their distribution cycle. For example, F&B managers will be able to predict when food deterioration is probable.

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