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# **ABSTRACT**

The paper analyzes the effect of the market analytics on supply chain performance. Examines the link between the analytical capabilities in the supply chain region and its success in the region plan, source, make and deliver. BA is not a tool, but a set of approaches, operational processes and tools used together to obtain information, analyse information and forecast the results of problem solutions.

# **INTRODUCTION**

Supply chain management plays a significant part in this new era, when rivalry is no longer between organisations, but between supply chains (Trkman et al. 2010). Figure 1 demonstrates controlling the supply chain traffic. Through rising the performance of SC, the supply chain gains its strategic edge and the management strategies become an important part of the corporate market cycle (Wang et al. 2016). Interest in Business Analytics (BA) analysis has been through over the years, because it makes the right business judgement based on the volume of data. Different words like Supply Chain Intelligence and Supply Chain Analytics (SCA) have become popular in industry and academia alike. We consider researching BA on different aspects of the supply chain. This paper analyses then the causal relation between business analytics, success in the supply chain, company efficiency and competitive advantage. It is important to achieve competitive advantage by enhancing supply chain analytics effectiveness and efficiency. BA has been considered as a crucial "resource" for SCM and optimization strategies have become an integral part of business processes within organisations. Only with BA will a right appropriate business judgement based on very broad quantities of both internal and external data. Therefore, it is not shocking that curiosity in the use of BA in analysis has increased.

# **CHALLENGES ASSOCIATED WITH SUPPLY CHAINS**

Globalizing every economy and growing corporations' presence across countries, global manufacturing operations and logistics teams are becoming dynamic and demanding. Delayed shipments, dysfunctional facilities, incoherent vendors will interrupt and postpone the shipments thus raising the supply chain costs of the business. **Some of the big problems confronting supply chain administrators today are the lack of visibility of SC and logistics systems, the management of market instability, cost variability in supply chain.**

Continuous flow of knowledge requires running an efficient supply chain, which in turn tends to build improved inventory distribution. The consumer is at the centre of the supply chain. So, one of SCM 's objectives is to create a successful customer-focused programme (Lambert et al. 1998). **Price, time and resource minimisation are the major challenges.** These challenges often represent the creation of consumer end practises, such as effective product distribution, labelling and storage, and associated operation management procedures. The main supply chain challenges are described and shown in Figure 2.

1. Distribution Network Optimization: The SC network includes finding factories and processing centres, as well as defining the method for delivering goods from vendors to factories and from warehouses to customers.
2. Green logistics: This means flexibility when it comes to use transport vehicles. Minimisation of greenhouse emissions are two of the main aspects of Green logistics.
3. Optimisation of path: Path optimisation is the most critical element in successfully managing the supply chain 's physical traffic.
4. Spatial Optimisation: Maximizing resource efficiency, increasing quality and even reducing expense are the main criteria of room management.
5. End mile delivery: The biggest obstacle in this issue is the secure distribution to consumers of thousands of products. A bigger problem here is the distribution of product on schedule.
6. Re-delivery Consignments: The criteria in Re-delivery consignments are good packing and storage, efficiency in transportation that decreases re-delivery.
7. Clearance time: The key criterion of custom clearance period is to maintain appropriate paperwork that reflects the client at the process of product inspection and assessment.
8. Track and Trace: The "Almost-Real-Time" monitoring and status & location details are some of the parameters under monitor and trace.

# **THE INFLUENCE OF BUSINESS ANALYTICS ON PRESSURE ASSOCIATED WITH SUPPLY CHAINS**

Evaluation and enhancement of the performance of a SC was an incredibly complicated task requiring several management processes, such as collection of metrics, definition of goals, planning, organization, tracking, recording of inputs. Therefore, a methodology focused on traditional thinking cannot be used to make SC-connected choices, using guidelines or best practices, etc. (Cai et al 2009).

Data processing thus remains at the core of decision taking in all enterprise applications. Data flow in a supply chain is shown in Figure 5. Improving SC output has become a continuous process which needs a measurement method for analytical results (Cai et al 2009). In addition, the use of BA benefits an information-based business by fostering productivity within an organization, especially by using empirical methods to provide useful decision-making expertise **to reduce operational costs and forecast consumer patterns accurately** (Hedgebeth 2007). **Hence companies with more sophisticated SC processes, i.e. improved BA expertise, reduce their expenses more efficiently and achieve higher profit margins than their less developed peers. In addition, better quality of SCM practices such as better information sharing performance would lead to greater competitive advantage of improved results** (Hoole 2005, cited in Trkman et al 2010).

# **THE INFLUENCE OF BUSINESS ANALYTICS ON THE PRESSURE FACED BY SC**

Supply chain costs are an important part of the business 's costs and supply chain managers face a challenge to cope with those costs. Supply chain prices have an immense impact on key financial metrics such as working capital, retail product expenses and cash flow. There should be a constant need to improve the financial results of industries which handle large volumes of inventories. Key areas where costs can be handled through analytics-driven intelligence include:

Materials: Analytical methods can enhance the visibility of products' true total component cost rather than pure volume. It is important to take a complete view of the cost of the supply chain for any given commodity in order to make optimal buying decisions on a cost basis should.

Logistics: Fluctuating market trends and growing supplier base and logistics partners have constantly forced companies to rethink their logistics strategy for networks. Significant ROI gains can be accomplished by strategic strategy activities such as path optimisation, load scheduling, vehicle positioning and freight expense reconciliation.

Sourcing: Sophisticated analytics solutions generate real-time vendor performance tracking data that supply chain administrators may willingly use to improve their procurement strategy. Through offering information from the original review to continuing risk control, this data enables professional recruitment.

Analytics plays a vital role in optimizing supply chain performance by rising awareness of the supply chain, managing volatility and growing cost variability. Supply chain often involves controlling the production, storage and distribution of goods along with the associated information flow to maximize the profit of the company by cost-effective order fulfillment (Anitha et al 2018). Several of the solutions to developing SC and having it business intelligent are as follows (Anitha et al 2018):

1. Autonomous Logistics: This defines the capacity of logistics objects to interpret the knowledge, make their own judgments and implement them.

2. Product intelligence: The way to easily store and move every actual order or instance of a commodity.

3. Intelligent transport systems: This primarily applies to creative road- and traffic-management systems. This helps the customer to be more educated, to use transport network healthier and wiser.

4.. Physical Internet: Real Internet implies taking advantage of the digital internet concept to build a functional infrastructure to address the global problem of resilience of logistics.

5. Intelligent cargo: Self-identification, background recognition, connections to resources, status control and authentication are functionality under Intelligent Cargo.

6. Self-organizing logistics: The tasks of a self-organized logistics organization without interference from supervisors, developers or supervision of the applications. The Intelligent Traffic Control Networks have drawn the largest attention of the above solutions over the last few years.

SCOR has also been described as a comprehensive method for defining, measuring and tracking the efficiency of the supply chains (Lockamy, McCormack 2004). A comprehensive performance assessment framework at multiple rates was built in the SCOR model, covering four main SC processes (also applied to Prepare, Input, Build, Provide, and later Return) (Lockamy, McCormack 2004). As described in Figure 3 sources of the application of analytics in various areas include:

1. In Plan: Study of evidence to predict potential sales in products and services; up to recently this has been mainly performed by marketing and finance departments in the form in monthly and annual reports (Azvine, Nauck, Cui 2005, cited in Trkman et al 2010).
2. In Source: Usage of an agent-based procurement approach with a procurement model, sampling, negotiation and evaluation agents to improve product identification, price negotiation and supply assessment and supplier selection / evaluation strategies (Lee et al 2009, cited in Trkman et al 2010).
3. In Make: Right production in terms of time not only of each inventory item but also of each creation belt and batch (Ranjan 2008, cited in Trkman et al 2010).
4. In Deliver: Many of BA's innovations in logistics management have been designed to bring products into the market more efficiently (Reyes 2005, cited in Trkman et al 2010).

Improvements in each of the four areas may dramatically improve the efficiency of the SC.

# **DATA ANALYTICS TECHNIQUES USED IN SUPPLY CHAIN MANAGEMENT**

Supply Chain Data Analytics are divided into three Analytics types**: Descriptive, Predictive and Prescriptive Analytics** (Anitha et al 2018). The flow of these is described in Figure 4.

**Descriptive Analytics:** is primarily used to evaluate "what's going on" today and address the "what's happened" problem in the past. It is the first analytics point where 90 per cent of companies are using this approach to boost the future. DA recognises and analyses the historical evidence. Descriptive Analytics primarily seeks to find challenges and gaps inside the current processes and functions in the SCM sector (Wang, Gang, et al 2016, cited in Anitha et al 2018).

**Predictive analytics :** uses both quantitative and qualitative approaches to evaluate real-time and historical data in order to predict past and potential patterns of convergence of business processes between roles or businesses, and the related costs and service rates (Waller et al 2013, cited in Anitha et al 2018).

**Prescriptive Analytics:** DA and PA dwell on what will happen and why, while Prescriptive Analytics anticipates "why's happened." This constantly gathers data to re-predict events that allow decision-makers to improve the precision of prediction and make smarter decisions. Prescriptive intelligence shows when those things happen (Anitha et al 2018).

# **CASE STUDY 1**

**Identify the most effective transport carriers by means of advanced analytics**

One of the issues faced by a Fortune 100 CPG firm was evaluating each carrier and selecting the best carrier for shipment around the globe. Although different metrics were available, the goal was to rate carrier efficiency and pick the right one to ship. Understanding the context for carrier selection, Fractal Analysis' solution adopted a stepwise approach by defining correlated characteristics, rating carriers and evaluating alternative carriers through what-if analysis.

# **CASE STUDY 2**

**Pierian Digital provided oil & gas system, prediction and visibility solution**

A Global EPC Service Provider faced problems without a shared user interface through applications to provide end-to - end analysis, analysis of global supply chain and logistics processes, and cost and schedule forecasting. Pierian Digital 's solution offered Proactive Supply Chain Quality Management Analytics tools that actually had a direct effect on top and bottom line market performance by enhancements through the whole supply chain.

# **CASE STUDY 3**

Strategists are seeking to gage potential investment return (ROI) in order to build a strong analytics business case. In a recent Gartner supply chain strategists’ study, when questioned about the ROI in analytics, an total of 29 percent of businesses said they reached high ROI levels utilizing analytics, compared to only 4 percent who reached no ROI. Nevertheless, there are also numerous drawbacks and obstacles to be addressed in order to reach scientific capabilities. Also, a good business argument has to be clear on what could get in the way.

# **CONCLUSION**

Strategies for Business Analytics in Supply Chains help businesspeople know the value of each report and how to process and evaluate the data and how to maximize their business value. Through using business analytics, the organization can track and evaluate the exact value of big data through increasing the data's understanding value, obtaining in-depth insights, and allowing business executives to make great and fast decisions about the beneficial market opportunities. The analytical skills can help direct human decisions and, in some organisation’s activities, make automated decisions. Business restructuring and operating cost reductions have led to the growth of supply chain analytics.

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# **APPENDICES**

Figure 1

Source: Anitha, Palaksha & Patil, Malini. (2018)

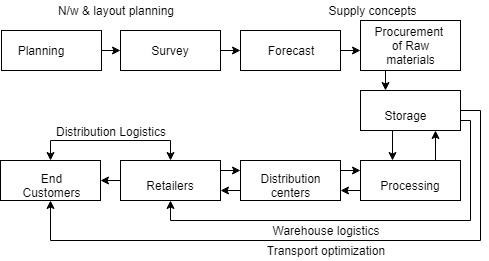


Figure 2

Source: Anitha, Palaksha & Patil, Malini. (2018)

A close up of a logo

Description automatically generated

Figure 3

Source: Irfan, Danish & Xu, Xiaofei & Deng, Shengchun & He, Zengyou. (2008)

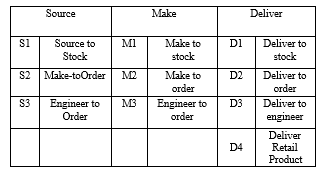


Figure 4

Source (Darvazeh, Vanani & Musolu 2020)

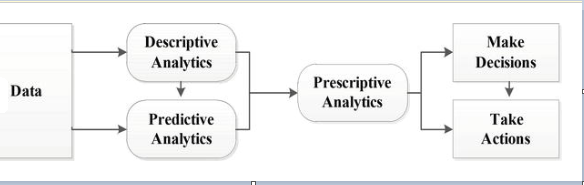


Figure 5

Source (Biswas, Sanjib & Sen, Jaydip, 2016)

