

Analyzing the impact business analytics can have on Indian SME's supply chain performance

Priyanka Anand P
Amrita School of Business
Amrita vishwa vidyapeetham
Amrita University,
Coimbatore, India
ppriyanka.anand@gmail.com

Dr. Sanjay Banerji
Professor Emeritus
Amrita School of Business,
Amrita University,
Coimbatore, India
s_banerji@amrita.edu

Abstract— Small and Medium Enterprises play a vital role in the growth of Indian economy due to its high level of flexibility, innovation and dynamism. With a huge number of promotional measures SME's are increasingly contributing to employment generation and economic development by increasing total industrial output and exports. However they are facing immense competition internally and externally. The Supply Chain plays a vital role in fulfilling demand, sourcing, procurement, production and logistics process in these SME. Hence Supply Chain Management (SCM) tools are being increasingly used strategically by these SME's to have an edge over competitors in the market. Business Analytics is an extension of SCM wherein it provides added capability of handling uncertainty and variability thus increasing the effectiveness of SCM. This paper studies the impact Business Analytics (BA) can have in Indian SME's in terms of performance and correctness of four key areas of SCM namely Plan, Source, Make and Deliver in the decision making traits so as to perform better in the market. The analysis is done based on the observation and results from expert interviews and an online survey that was carried out as part of the study.

Keywords—Business Analytics; Supply chain; SME; Performance

I. INTRODUCTION

According to the Government of India an enterprise falls under small and medium scale industry (SME), if the investment in plant and machinery or equipment's by the enterprise is more than twenty five lakh rupees but does not exceed ten crore rupees for manufacturing sector and for service sector the investment should be more than ten lakh rupees but does not exceed five crore rupees [1]. Indian SME sector has been developing as the most dynamic and vibrant sector of the country in the last five decades. SMEs plays a major role by providing platform for employment generation at a relatively lower cost than big enterprises. They also help in industrialization of rural areas and contribute towards socio-economic development of the country. In India SME's constitute around 36 million units and give employments to more than 80 million individuals. The SME Sector produce more than 6,000 products adding about 8% to Indian GDP.

India's 45% to the total manufacturing output and 40% to the exports are from SMEs [2].

Regardless of the sectors high enthusiasm and inherent abilities to raise, it is also facing various problems such as technological outmodedness, supply chain inefficiencies, increasing competition, low working capital, poor skilled operators, and change in business policies and uncertain market situation. To withstand and overcome such problems, SMEs have to adopt modern techniques in their operations. SMEs that can provide ground-breaking achievement, wishing to have global outlook in its business, along with great technological base, competitive spirit and a willingness to restructure themselves can withstand the present challenges. One such field of optimal investment for these SME's is in supply chain.

Enhancing supply chain efficiency helps in improving elementary metrics and recording, thereby providing enriched data for performance development resourcefulness, which further gives a greater visibility in supply chain activities. Capitalizing in supply chain visibility can help in increasing supply chain responsiveness, cost optimization and diminishing customer impact. They further help in improving key financial metrics like cash flow, cost of goods sold and working capital.

On the other hand business analytics is one of the most hissed word in the business environment. Business Analytics (BA) is used as a competitive tool by enterprises to outsmart its business competitors and withstand the current market challenge. Application of these analytics driven techniques in Supply chain of SME's can help them monitor critical activities such as source, plan, procure and distribution in real time through numerous touch points.

Though a number of studies have been carried out to understand the impact of BA in SCM, no studies have been done on Indian context pertaining specially to Small scale industries. This paper fills that gap by analyzing the impact, business analytics can have on Indian SME's supply chain performance. The study basically involves few expert interviews followed by an online survey. Various key aspects and current practices were closely monitored and recognized to figure out the gap, analyze the existing practices so as to

understand the extent to which BA can be applied in the Supply Chain practices in order to improve its performance. The flow of the paper is as follows: Detailed literature review on small scale industry in India and their practices, Supply Chain practices and Business Analytics is done. The methodology and data analysis techniques is discussed followed by results, limitations. At the end the summary of the entire study is concluded.

II. LITERATURE REVIEW

1) *Business Analytics*

The contextual meaning of Business Analytics (BA) as per this paper is the use of various analytic practices to solve problems and answer interrogations related to Supply chain Management [3]. It consists of innumerable techniques and principle that help in analyzing the relationship between various dependent and independent variable through which meaningful conclusion can be derived [4]. Hence, a correct relevant business decision based on bundles of very large volumes of variables is only possible with Business Analytics [5]

2) *Small and Medium Enterprises in India*

Over 48 million Small and Medium Enterprises with an exponential growth curve is the current status of Indian SME [6]. Their contribution to the Indian economy is enormous constituting about 45% of total industrial output, a 40% share in the exports along with about 1.4 million jobs annually [7]. On the other hand the expectations from them is too high, with customers demanding quality products at low cost and the global market giving a tough competition [8]. Lower cost of production, increasing customer base, technological up gradation are few of the areas wherein key investments can be made in order to sustain successfully in the market [9]. On looking closer at these areas it is very evident that innovation in supply chain network can help in tackle the competitive pressure for these SMEs [10] [11].

3) *Supply Chain Management*

Supply Chain network involves a huge base starting from supplier, manufacturer themselves, retailer, customer that actually makes the ends meet between the producer and consumer through various channels of production, finance, distribution, etc. [12] The entire network is managed by SCM system which too is under rapid transformation to keep in pace with growing requirements. [2] Modern day SCM that big corporates have incorporated includes areas such as supply chain collaboration, supply chain analytics, value enhancement, and virtual supply networks. [5] Supply chain management plays a crucial role in altering Indian SME performance. [1]

III. RESEARCH MODEL

The research model is framed from a set of independent variable that includes Plan, Source, Deliver and Make

followed by the dependent variable as performance. The moderators of the framework include Information support system. The consideration for the independent variable as an area of application of business analytics is as:

Plan: BA can be used to refine the existing practice involved in production planning of SMEs by predicting trends in market, the factors affecting them and the ways to tackle sudden fluctuations in market.

Source: Obtaining better price by negotiation, understanding the supplier and their practices, choosing the suitable supplier; all these can be done with greater precision on using BA.

Make: BA is good source of guide to have the best inventory practice. It helps the producer understand the advantage of what it is to keep the right amount of inventory. Not only the inventory size but the batch size, lot number can all be planned precisely.

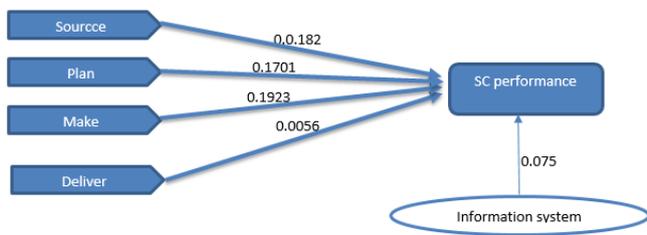
Deliver: Delivering to the distributor at the right time without delaying at the stake of the customer loyalty can be done only with BA.

Now after understanding the benefits of BA in Supply chain, the main challenge lies in harnessing this advantage and taking it to the SMEs who usually lack the infrastructure or IT knowledge to reap the benefits. Often they do not have the practice of day to day nor a rolling scheduling. But on the other hand these SMEs are largely investing in IT infrastructure replacing the traditional paper pen practice. So it is the best time for adopting trends such as BA in these SMEs. Hence the online survey that was conducted as part of this paper analyzed the extent to which Information support system exists for the sample chosen. If they are willing to adopt the new trend and if so what do they think the major constraint could be. On the other side the expert interview helped in analyzing the practices, notions of these SME.

IV. METHODOLOGY AND ANALYSIS

Various practices and trends in various areas such as source, plan, make, deliver were analyzed by asking questions with answers yes, partially, no and agree, disagree, don't know. The performance of each sector was also ranked.

The analysis is done using Structural Equation Modelling (SEM) wherein the relationship between dependent and independent variable is established along with the moderator effect i.e., Information system. The analysis and data processing have been adopted from Trkman, Peter, et al. [1]. The sample size for the analysis was about 150, all representing SMEs across India.



V. CONCLUSION

It is very evident from the above study that BA can play a critical role in improving the performance of Indian SMEs with a little investment in Information system. The better the Information system infrastructure, the better is the application capability of BA. SMEs can start with basic BA functions to start with, as most of these SME have some or the other form of BA in application as of now. The analysis shows the SMEs are willing to implement BA techniques in supply chain but are not sure where to start with.

Further analysis can include on point of start of BA in Supply chain and how it can be extended to other areas. The limitations include, the sample size was only 150 and taken randomly. Hence the results may not be applicable uniformly to all SMEs across India but most likely represent the major population. This difference is probably because of the unique factors these SME adopt to according to their region [13]. The notion that SMEs is not in pace in adopting newer technology is broken. Rather they are adopting newer technologies slowly and are willing to adopt more automation and critical learning from Information system.

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