Application of Big Data Analysis in Managing Supply Chain: Reference to MSME's

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Operations and supply Chain Management (SCM) deals with a broader area that covers both manufacturing and service industries. It involves various functions of materials management, demand forecasting, retail management, operations planning, distribution, logistics, retail, demand, forecasting, order fulfilment, and many more.

SCM attempts to centrally control or link the assembly, shipment, and distribution of a product. Companies are able to cut excess costs and deliver goods to the consumer quicker by controlling the supply chain. This is often done by keeping tighter control of internal inventories, internal production, distribution, sales, and thus the inventories of company vendors. SCM is based on the concept that every product brings market results from the efforts of various organizations that make up a supply chain.

While supply chains have existed for years, most businesses have only recently paid attention to them a value add to their operations. Green supply chain and sustainability is also emerging and many organizations are now finding alternative ways to attenuate environmental hazards. In case of small and medium-sized enterprises, they tend not to give too much importance to environmental management practices and so their performance is low with reduced environmental impact because of waste reduction, and low carbon prints. Also, SMEs have almost no sustainability goals and practices.
SMEs also consider environmental measures as expensive albeit cost reduction benefits are highlighted to them. A large percentage (95%) of SMEs aren't aware that environmental practices and sustainability can improve operational efficiencies, reduce costs and risks and supply new opportunities. Hence SMEs are considered to be the main problem area within the field of environmental regulation. If SME's adopt green supply chain management processes then they can get greater insights by using Big Data Analytics which is currently utilized in many of the Operations and supply Chain processes.

Big Data Analytics can analyse vast volumes of data to identify hidden trends, associations, and other insights. With today's technology, you can analyse the data and get answers sooner with more conventional business intelligence solutions. Big data has been around for years; most companies now realize that if they collect all the data that streams into their industries, they can apply analytics and gain substantial value from it like discovering insights and patterns.

The research by R.P. Mohanty and Anand Prakash illustrated the application of SEM (Structural Equational Modelling) to know the GSCM practices concerning MSME in India. Structural equation modelling is a multivariate statistical analysis technique used to analyse structural relationships. The researchers identified 4 alternative models for Path Analysis and different endogenous and exogenous variables were created within the 4 models with each model parameter having the chance of getting estimated independently.

Diabat and Govindan studies on implementation of green supply chain in one the aluminium company in southern Indian. The methodology of Interpretive Structural Modelling is employed. The advantage is getting a clear and a well-defined model. Data are often sourced in several formats like web, social media, ERP systems, cloud platforms etc. and that they are often either in text, video, audio formats. To read and analyse this data, different terminologies like web analytics, text analytics, social analytics, network analytics, multi-media analytics are utilized. For processing, Apache Hadoop. Dryad and Pentaho Business Analytics are used as processing platforms (Tsan-Ming Choi, Stein W. Wallace, Yulan Wang).

Machine learning is also one such modern technique which is well highlighted in big data analytics and with the assistance of machine learning techniques like neural networks, support vector machine and statistical machine learning, greater insights are often achieved in operations and supply chain management. Optimization and Forecasting also are few of the methodologies utilized in Big Data Analytics for decision-making in supply chain. Mahya Seyedan and Fereshteh Mafakheri investigated the predictive Big Data Analytics applications in supply chain demand forecasting to propose a classification of customer behaviour analysis, trend analysis, and demand prediction.

The researcher classified this algorithm and their applications in supply chain management in to time series forecasting, clustering, K-nearest neighbours, neural network, multivariate analysis, support vector machines, and support vector regression. The neural networks and multivariate analysis is used for getting good results. Also, the review concludes that how operations research techniques in association with Big Data Analytics can efficiently improve the business insights and decision making for the complex supply chain. Larger and sophisticated data is easily tackled by various analytical techniques in operations research and big Data Analytics.

FUTURE PROSPECTUS:

There is an increasing scope for MSME globally to check whether the manufacturing is changing their focus from traditional to green supply chain. Issues like sub-supplier management, behavioural /individual issues in sustainable supply chains, barriers and enablers and evaluation of sustainable supply chain implementation are also emerging.

Future research must utilize actual data from industry practices rather than merely counting on subjective opinions of respondents. The incorporation of real business data, practitioners and academicians is likely to help solve both practical and theoretical development. This might occur more frequently as practical and normative modelling continues to develop within the green supply chain management field (Fahimnia, Sarkis, and Davarzani, 2015).

Informal modelling of greens supply chain management with practical applications are also a probable area of future research. Big data analytics in supply chain management are often used to understand demand forecasting under uncertainties, to improve collaborative performance among partners in supply chain network, to enhance product quality and eliminate defects, to increase supply chain agility, adaptability, robustness and alignment and to enhance supply chain resilience.

The utilization of big data analytics though remains an under-explored area. It'll be promising and challenging to see how big data analytics are often applied for critical issues like strategic partnership and channel coordination in supply chain systems. The utilization of big data analytics is also related to many issues like data privacy, threats to human and welfare. The study in these areas is required to ensure that proper rules are imposed to make sure that the utilization of big data analytics is ethically sound and can contribute positively to society.