

The Potential Impact of Big Data Analytics on Pharmaceutical Supply Chain Management

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Abstract : Big Data Analytics (BDA) in supply chain management has recently drawn the attention of academics and practitioners. Big data refers to a massive amount of data from different sources, in different formats, generated at high speed through transactions in business environments and supply chain networks. Traditional statistical tools and techniques find it difficult to analyse this massive data. BDA can assist organisations to capture, store, and analyse data specifically in the field of supply chain. Currently, there is a paucity of research on BDA in the pharmaceutical supply chain context. In this research, the Australian pharmaceutical supply chain was selected as the case study. This industry is highly significant since the right medicine must reach the right patients, at the right time, in right quantity, in good condition, and at the right price to save lives. However, drug shortages remain a substantial problem for hospitals across Australia with implications on patient care, staff resourcing, and expenditure. Furthermore, a massive volume and variety of data is generated at fast speed from multiple sources in pharmaceutical supply chain, which needs to be captured and analysed to benefit operational decisions at every stage of supply chain processes. As the pharmaceutical industry lags behind other industries in using BDA, it raises the question of whether the use of BDA can improve transparency among pharmaceutical supply chain by enabling the partners to make informed-decisions across their operational activities. This presentation explores the impacts of BDA on supply chain management. An exploratory qualitative approach was adopted to analyse data collected through interviews. This study also explores the BDA potential in the whole pharmaceutical supply chain rather than focusing on a single entity. Twenty semi-structured interviews were undertaken with top managers in fifteen organisations (five pharmaceutical manufacturers, five wholesalers/distributors, and five public hospital pharmacies) to investigate their views on the use of BDA. The findings revealed that BDA can enable pharmaceutical entities to have improved visibility over the whole supply chain and also the market; it enables entities, especially manufacturers, to monitor consumption and the demand rate in real-time and make accurate demand forecasts which reduce drug shortages. Timely and precise decision-making can allow the entities to source and manage their stocks more effectively. This can likely address the drug demand at hospitals and respond to unanticipated issues such as drug shortages. Earlier studies explore BDA in the context of clinical healthcare; however, this presentation investigates the benefits of BDA in the Australian pharmaceutical supply chain. Furthermore, this research enhances managers' insight into the potentials of BDA at every stage of supply chain processes and helps to improve decision-making in their supply chain operations. The findings will turn the rhetoric of data-driven decision into a reality where the managers may opt for analytics for improved decision-making in the supply chain processes.

Keywords : big data analytics, data-driven decision, pharmaceutical industry, supply chain management

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020