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Big Data Logic and Supply Chain Barriers Survey

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Abstract:

Numerous business intelligence solutions have evolved as a result of the expansion of the amount of available data; these tools may all be described as "big data analytics" when combined. Because it can handle international, complicated, unstable, and dynamic value networks, BDA is crucial in operations linked to supply chain management. Operations management experts are interested in big data skills because of their strong effect on supply chains and overall business performance. These academics believe that big data capabilities will have a huge impact on supply chains and company performance. This study covered the relevance of big data analytics and how it relates to the supply chain environment. The authors showed how big data analytics is a crucial component of an organization's success in a competitive, international market.

Keywords: big data, large-scale data, supply chain, textual data,

1. Introduction:

The pace of data movement in the 21st century seemed unimaginable. In the previous two decades, data has multiplied quickly, giving rise to "big data." The explosion of digital technology supports the growth of big data even more. Globally, people are becoming more acclimated to the sensors, communication devices, motors, and data subjects that come along with technology as it becomes more widely available. In addition, 2011 research by the International Data Corporation found that one zettabyte of data had already been generated globally. The rate of growth has been growing; in 2014, the total quantity of data had climbed to 7 ZB; by 2020, it will have exceeded 50 ZB. At least half of it is textual data created by social media. The textual data produced by social media, especially Twitter and Instagram, is

particularly useful for conducting sentiment analysis. Social media's great value is that they expose the thoughts and feelings of vast numbers of people[1].

Big data projections made by the most current Statista service platform predict that by 2025, data will have grown by 1.3 trillion terabytes, or 180 zettabytes, over the previous year. This increase in data traffic may be attributed to the rising popularity of telecommuting, working remotely, and engaging in online leisure activities during the COVID-19 lockdown periods, which has resulted in an increase in desire for remote learning, working, and entertainment. In the real world, thousands of network sensors are also integrated into automobiles, smart energy meters, cellphones, autos, and other heavy machinery. The Internet of Things has been propelled by improvements in electronic sensors and communication technology (IoT). Around the globe, 127 new devices are entering the internet every second, according to IDC. More than 90 percent of sensors will be "smart" by 2018. "Many of these devices will be autonomous, meaning they can receive data and make decisions on their own without human intervention."

Data is becoming more important to help drive these changes as organizations need support strategies and procedures to thrive. While all businesses may benefit from spending on computing platforms, not all can use those efforts to produce improved outcomes. Given that it could be rare and difficult to duplicate in the short- to medium-term, one of its benefits is the capacity to use big data. Many analysts think that big data exploitation and harnessing will soon represent the "blue ocean" in terms of complete firm profitability after businesses have leveraged big data to increase their market dominance. According to published research, technical advancements and digitization are still the main forces driving increased big data expenditure.

Given the intense rivalry in every industry, companies must focus on innovation to remain competitive. Big data analytics provides the precise quantity of information that industry experts need to make educated decisions. These decisions may aid an industry's advancement by accurately identifying a market trend that can boost sales. At the end of 2019, big data spending had already exceeded $180 billion globally, and from 2020 to 2022, it is anticipated to expand at a pace of 13.2 percent (Business Wire). According to statistics, the areas where the greatest expenditures are made on big data analytics include IT expenses, hardware purchases, and business services.

1.2 Supply chain analytics

In recent times, supply networks have undergone a significant transformation, becoming increasingly complex, multi-tiered, and widespread across the globe. This evolution has posed both challenges and opportunities for businesses. On one hand, there is a growing necessity to cut down on expenses without compromising on critical factors such as delivering exceptional guest service and providing premium goods and services. On the other hand, the surge in international data volume due to advancements in Information and Communication Technology (ICT), including Web 2.0 and the Internet of Things (IoT), has opened up avenues for companies to seek innovative

solutions and strategies to tackle these challenges head-on.

Enter data-driven information systems - a revolutionary approach that enables large-scale data collection and analysis using cutting-edge methods like data analysis, artificial intelligence, and machine learning. Leveraging big data analytics holds the potential to unveil new insights for optimizing supply chain efficiency and enhancing the network's ability to handle uncertainties effectively. Therefore, integrating state-of-the-art technologies for data collection and analysis can significantly benefit businesses. While it may not guarantee a competitive advantage, employing advanced methodologies to analyse big data will undoubtedly boost supply chain management efficiency. This newfound efficiency is poised to equip supply chains with greater resilience to withstand future uncertainties. Hence, embracing big data analytics is not just an option, but a necessity to strengthen the supply chain.

The importance of data acquisition information systems and analysis skills is underscored by the substantial investments made by various industries, such as the industrial and banking sectors. Their combined spending on foreign information and data analysis solutions exceeded $150 billion in 2017, marking a remarkable 12.5% growth compared to the previous year. This trend highlights the widespread recognition of the significance of data-driven solutions in addressing contemporary challenges[2].

As businesses strive to navigate the dynamic global landscape, they seek to leverage modern tools that enable the development and implementation of Big Data Analytics (BDA) processes in distribution networks. These tools hold immense potential for streamlining operations, managing and minimizing risks, introducing innovative products to the competitive market, and making data-driven decisions that revolve around specific products.

With the increasing demand for information and data analytics solutions worldwide, many companies are investing in data acquisition information systems and analysis skills, or have intentions to do so. This surge in demand has spurred several major players in the BDA arena to forge partnerships and make deals, aiming to assist businesses with distribution analysis and provide them with tools that simplify the process.

The rise of intricate supply networks coupled with the proliferation of international data has necessitated the adoption of data-driven information systems. Utilizing advanced big data analytics methodologies is crucial for enhancing supply chain management efficiency and fostering greater resilience to tackle uncertainties. As businesses worldwide recognize the potential of BDA, investments in data acquisition and analysis capabilities are on the rise, further solidifying the importance of harnessing data-driven solutions for continued growth and success in a rapidly evolving business landscape.

2. Big Data Affinity:

There are vast amounts of data present in each and every part of the world's economy. From retail stores to passenger planes, businesses use data to their advantage in a variety of contexts. To describe the multiple dimensions of the

topic of big data, the phrase "five V's of data" is often used. According to the definition of big data, it has a massive number (large scale), high velocity (moving or streaming), and a high degree of diversity. In addition, big data includes data assets that need innovative, cost-effective information processing for better understanding and judgment. Two more Vs have been added to this definition of big data as a result of the movie's development. Value is one of the Vs, and it addresses the need to generate financial benefit.

In a variety of situations, techniques including predictive data analytics, natural language processing, data mining, and machine learning algorithms are utilized to glean vital information and draw insightful conclusions. Furthermore, there is some uncertainty in the literary concept of business intelligence. Supply chain analytics, big data analytics, predictive analytics, and business intelligence are often combined. The idea encompasses tasks like data gathering, storing, and analyzing, enabling firms to get insightful information that strengthens their market position. Despite being one of the leading IT companies, with a presence in over 150 countries worldwide, information technology (IT) services form only a small part of India's $2 trillion GDP[3].

3. Supply Chain Analysis

In the latest days, supply networks are more intricate, cross-platform, and distributed around the globe. However, there is an increasing need to reduce expenses without compromising other competitive factors, such as offering top-notch customer service and high-quality items and services. Furthermore, the amount of worldwide data has significantly increased because of ICT developments like Web 2.0 and the Internet of Things (IoT). As a consequence, companies have been searching for cutting-edge technology and creative solutions to assist them in overcoming the obstacles. Enterprise resource planning (ERP) is a branch of systems and management sciences, and it offers information, analytical capabilities, processes, procedures, and options to firms that help it achieve its objective . ERP offers information, analytical capabilities, processes, procedures, and options to firms that help it achieve its objective. procedures, bringing new goods to the market, performing market assessments for specific products—all of these BDA-assisted processes may improve and contribute to a business's overall success.

As a consequence, many businesses have made investments in data processing technology and cognitive technologies or have plans to do so. According to reports, the finance and industrial sectors spent more than $150 billion on worldwide technology and analytics-related solutions in 2017, an increase of 12.5% over the previous year. Due to the emergence of modern tools, there are several possibilities available for businesses interested in developing BDA tools and implementing BDA processes in supplier relationships. supply chain production, risk management and risk reduction, and procedure refinement. There are several possibilities available for businesses interested in developing BDA tools and implementing BDA processes in supplier relationships. Here are some of the different applications

of business analytics in supply chain management[4].

4. Large-scale data analysis and ethical supply chains

Due to a calamity of unparalleled dimensions that occurred in Japan in 2011, many foreign businesses, including Sony and Honda, had to suspend manufacturing. It is clear from the literature that implementing sourcing strategies and streamlining business processes will help reduce the likelihood of supply chain disruptions and therefore boost overall efficiency. It is essential to remember that improving data analytics requires traceability as well. The ability to develop and improve demand and supply chain visibility is best suited to companies that can develop and deploy data analytics solutions. believe that supply chain management is a desired ability in the age of the Industrial Revolution 4.0 and that supply chain disruptions may be reduced as a consequence. It is clear from the literature that implementing sourcing strategies and streamlining business processes will help reduce the likelihood of supply chain disruptions and therefore boost overall efficiency for companies that have the ability to develop and deploy data analytics solutions[5].

5. Implications of big data analytics restrictions

Although it is possible to conduct analyses on large amounts of data, the company's big data operations efforts are hampered by numerous obstacles. The innovative concept of BDA has the potential to advance the digital industry. Ongoing study even now contains a sizable amount of "publications," or unreleased or disguised publications. However, diary submissions have started to appear more lately. However, it appears that there is a dearth of scholarly research examining the issues, challenges, and obstacles related to BDA and BDA's application. The following section focuses on obstacles to BDA implementation by manufacturers.

Depending on how top management interprets and evaluates company morals and ideals, the organizational structure is established. Due to these aspects, some big data difficulties could originate from organizational behavior instead of data or technology. While a company may be aware of the strategic potential of big data, it may not completely understand how big data may improve its processes. As a consequence, the company may not see much benefit from implementing big data initiatives. Building a data-driven culture has received a lot of attention in research since doing so has been shown to be very challenging when using big data tactics. People who use advanced analytics to make choices are said to live in a "data-driven society." One of the key causes of the failure of so many big data efforts is the lack of an information mindset. Instead of making judgments based on facts and evidence, many CEOs instead rely on their gut feelings or past knowledge. The actions of leaders may affect how everyone else in the organization makes choices.

Nevertheless, the implementation of any technical solution necessitates the use of an effective change management approach. Technologies have been shown to have a substantial impact on evolution during the previous ten years in many different ways. Previously, the change process was often perceived as commercial and simple, but

today it is recognized as complex, multilayered, lengthy, and wide. In other words, it has evolved into a novel idea, making it harder to put into practice successfully. Wide systems are expected to be more complex than ever, and competently managing change will be essential for businesses to effectively implement any technology in the company. This prediction is shared by entrepreneurs, technologists, and organizational specialists.

6. Conclusion

BDA could be useful in constructing and improving a responsive and dependable SC. Due to SC's increasing complexity, a platform like BDA and a great information control framework are required. Nevertheless, businesses must develop the necessary BDA capabilities in order to achieve this aim. If a business wishes to use technology to optimize operational efficiency, BDA is crucial to implement. Organizations, therefore, have challenges when using big data in supply chains for production. Providing full analytical abilities is among the major issues facing the supply chain in the current day. To make this a reality, a transdisciplinary strategy integrating SC organizations is needed, as is the capacity to exchange and acquire crucial data across the SC. The supply chain helps managers make judgments thanks to the five Vs of big data since they can access real-time data. Due to the tools made possible by technology, businesses may now perform better financially and operationally. The entire cost of firm operations has decreased as a result of operational efficiency. Because businesses now better understand their clients, big data as a technology promotes client pleasure and improves their whole experiences.

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