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HOW BIG DATA WILL BE AN ADDED VALUE TO SCM?

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HOW BIG DATA WILL BE AN ADDED VALUE TO SCM?

Abstract

It is the era of digital information technology where almost everything is going smart. Thus, organizations move towards digitalization that cause the emergent of Big Data. Analyzing big data is the big challenge today. Being smart puts the world under a big challenge to adapt, change, and upgrade systems to analyze the Big Data using the high technology. Challenges are growing with the market and appears in different forms. Many of these challenges can be hard or difficult to handle on your own if you are a small to medium size business without the help of supply chain management system. The main objective of this paper is to contribute and examine these research questions: What are the Big Data Analytical tools used in SCM? In addition to the Impact of Analyzing Big Data on Supply Chain Management? The methodology used was a systematic review over the existing literature including Big Data, supply chain, SCM, and the impact of BD analytical tools on SCM. Data collected and unsystematically interpreted and the findings summarized in a subjective way that describes and discusses the literature from a contextual or theoretical point of view. Big data can tremendously affect the supply chain units and can add values to the overall supply chain operations by improving the processes to be more effective and efficient based on the analysis results. Big data analytics become a core differentiation factor for any organization that acquire it in the last few years.

Keywords

Big data, supply chain management, Big Data: 5 V's, Value Chain, and Analytical Tools.

1. INTRODUCTION

Life is about change. Change is in everything and everywhere, even in yourself and in your way of thinking. The 21st century is the digital age century. Economies in this era depends on information technology to change everything to be digital where organizations are moving from paper to paper less. To live this era and sustain, you must adapt to change. This process leads to the emergent of Big Data. Now almost all the Strategic approaches made to go globally or to invest in other counties and mainly in the developing counties where the market emerges. As the market is growing, challenges also grows and appears in different forms. For that, Strategic supply chain management must always be at the top priority so that you do not fall behind when challenges appear. Many of these challenges can be difficult or impossible to handle on your own if you are a small to medium size business without the help of supply chain management system. This is because Datasets are growing Bigger and bigger to become even huge. This makes data so difficult to handled using traditional database management systems. (Elgendy & Elragal, 2014).

The main objective of this paper is to contribute and examine these research questions: What are the Big Data Analytical tools used in SCM? In addition to the Impact of Analyzing Big Data on Supply Chain Management? To answer these questions, this research studies in depth the Big Data analysis tools and the supply chain management Data retrieved from articles published in peer-reviewed journals, conference proceedings and papers, empirical or evidence-based articles in scholarly, and internet. The methodology used was a systematic review over the existing literature including Big Data, supply chain, SCM, and the impact of BD analytical tools on SCM. Data collected and unsystematically interpreted and the findings summarized in a subjective way that describes and discusses the literature from a contextual or theoretical point of view. The big data integration with the Supply Chain Management is effective in development of successful organizations. It corporates the needs of customers and suppliers in a chain. It can control all the materials from end to end in national and global production and manufacturing system. It can be easily applied in a national contemporary organization that starts to think outside the box to catch the multinational and the global companies and to deal with supplies with different way of thinking and thus shifting from local shareholders and suppliers into global one taking into consideration the country culture and environment. Moreover, nowadays another benefit of SCM is saving the environment and reducing the pollution because of production (Keshteli & Fathollahi Fard, 2018).

2. LITERATURE REVIEW

Being smart puts the world under a big challenge to adapt, change, and upgrade systems to analyze the Big Data using the high technology. This change is in doing normal things in a different, better, and much more faster way at a much affordable rate. Simply, it is a complicated and extremely difficult task to manage and retrieve data from your flash memories and external hard disks without the help of a special index that web based servers provide. Thus, Data will die inside the spreadsheets without being analyzed.

Now you can cross the oceans and go overseas to catch the world in a single click and reach whatever you want at any time by using the internet which can be afforded by anybody over the world. This revolution is a technological evolution that changed the world and can be used and applied almost everywhere. Internet, networks, software, applications, and social media are the main sources of data and the heavy use of it makes the data big.

As per the Internet World Stats (March 31, 2021), the world population consists of about 7,875,765,587, around 5,168,780,607 people all over the world are using internet. Thus we can talk about 65.6 % of the people are using internet. Moreover, about 54.9 % of the world population are from Asia region and especially from China and India. Logically about 53.4 % of the internet users are from Asia region, 14.3 % Europe, 11.5 % Africa, 9.6 % Latin America, 6.7 % North America, 3.9 % Middle East, and 0.6 % Australia (Internet users in the world by regions, 2021).

Dealing with this data, we can conclude that the main producer of big data are the Asian population and industries and this is enough to produce what is known as big data.

2.1 Big Data

Cisco reveals that in 2008 and 2009, the number of connected devices exceeds the number of living people in 2008 and 2009. By 2020, about 26 billion devices founded and connected on earth, I.e. about 3 devices per person on average (Evans, 2011).

Because Big Data is growing rapidly, we cannot have a direct definition to it in terms of size terabyte or zettabyte (Sanders, 2014). According to Boyd and Crawford, Big Data is not about the data that is big rather than about the large data sets ability and capacity to search and aggregate it. It is a scholarly phenomenon and technological culture that facilitates the interplay of Technology, Analysis, and Mythology by maximizing computation power and algorithmic accuracy to identify patterns on large data sets and offer a higher intelligent form with an aura of truth, objectivity and accuracy (Boyd & Crawford, 2012).

Mayer-Schönberger and Cukier describe Big Data by the way it can analyze information and transfer it in order to understand the organize society. They talk about three keys which are more data, more messy and correlation. Thus using all the data instead of taking a sample of it to be complete and accurate and overtakes causality to predict a sense of trends and finally make decisions (Mayer-Schönberger & Cukier, 2013). Big Data is characterized by a High Volume, Velocity and Variety to acquire the Information assets with specific Technology and Analytical Methods to transform it into Value." (De Mauro, Greco, & Grimaldi, 2014).

Data is Big when the conventional database systems in its capacity cannot handle it and requires an alternative way to process it. Big Data is so large when a single hard drive cannot hold it and requires several different disks to be stored. National Institute of Standards and Technology (NIST) defines Big Data as a "scalable architecture for efficient storage, manipulation, and analysis". Microsoft describes it as applying serious computing power to massive sets of information (De Mauro, Greco, & Grimaldi, 2014).

Big Data is a huge, complex, or massive data form in database systems that is hard to compute and analyze using ordinary systems. Computing Big Data will afford the best practices of data resources to take good business decisions in a short period of time (Chen, H. L. Chiang, & C. Storey, 2012).

Big data is not about its size. It is about the ability to deal with problems and messes better than ever before in a pretty way than everyone can do it (Sanders, 2014). For that, I think useful data is not big, it is tiny and small. A duo of Big Data and Data Analysis together should be performed because big data is just tons of numbers without analytics and Analytics is simply mathematical functions and formulas in statistical tools and applications without big data. Thus combining Big Data with the Analytical one gives the data its meaning and will make the difference in information technology to be information used in business intelligence (Sanders, 2014).

2.2 Data from kilobyte to Yottabyte

In the past, the size of server was huge and the data stored was small but nowadays, the server size is very small and the data collected is huge. This was the challenge in the last few years and the important technological hint is the ability to store a bigger quantity of data on smaller devices or over cloud servers (De Mauro, Greco, & Grimaldi, 2014). In 1970, the huge Database server was not affordable to all. The cost of one terabyte server was about one million dollar while in 2014; it falls to 50 dollars (Sanders, 2014). Nowadays, storing data has become cheaper and feasible and can be acquired by all organizations to have values from the huge records of stored data. Now business value can be achieved using new technical architectures and Data analytical tools to acquire the data scale, distribution, diversity, and timeliness (Elgendy & Elragal, 2014).

Digitization achieved by using digital devices and Datafication occurs from connections that aggregate transactions and records. Mobile phones, sensors, Radio-Frequency Identification - RFID - tags, and actuators are able to interact with each other and cooperate with the surrounding to reach common goals. These varieties of objects

consists the backbone of what is known as The Internet of Things. Thus, Internet of things is the fuel of Big Data expansion and Data is the new oil (Evans, 2011).

WWW. World Wide Web in 1990 was the mushrooming start point of the big data and the Database technology was found but costly and not well suited (Chen, H. L. Chiang, & C. Storey, 2012).

The data size is rapidly growing in a rate of 40% every year starting with kilobyte and moving towards megabyte, gigabyte, terabyte, petabyte, Exabyte, zettabyte, and yottabyte. The data produced nowadays is stored in form of zettabytes (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

2.3 Big Data 5 V's: Volume, Velocity, Variety, Veracity, and Variability

A further challenge for companies to use information and histories is the millennium that provides useful and effective results to display alongside and fund (Chen, H. L. Chiang, & C. Storey, 2012).

The first three V's that characterize big data are the volume, variety, and velocity. The volume reflects how massive the data size is including the number of records, tables, transactions, or files and measured in terms of TBs or PBs. It is the amount of stored data in Data warehouse that is rapidly growing every year. For instance, in year 2000, 800,000 petabytes (PB) of data were stored in the world. According to IBM it is anticipated to reach 35 zettabytes (ZB) by 2020. Social media plays a key role ie Twitter generates 7+ terabytes (TB) of data every day. Face book, 10 TB. Mobile devices also play an important role (Thomas, 2015).

Data volume is the characteristic that complicates the analysis and make it difficult to manage within a tolerable elapsed time. The larger the set of data, the more difficult it becomes to manage. Other problems like capture, storage, search, sharing, analytics, and visualizing complicate the data and to overlap it new data architectures, analytical methods, and tools can be used (Elgendy & Elragal, 2014).

Moreover, velocity or speed of data generation can also characterize the big data. It is the rate of data change and how often it is created with the frequency of data processing can maximize its value. Data processing applications are inadequate and distributed databases are needed (Parameshwaran, 2017).

Variety in type is a characteristic of the data generated today. It refers the different formats and types of data, and the different kinds of uses and methods of analyzing the data (Elgendy & Elragal, 2014). Variety of data means different formats. In traditional databases, it is structured and numeric data (Parameshwaran, 2017). The variety of sources including logs, clickstreams, and social media makes the big data really big. The structured resources such as numeric information and traditional texts combined with the semi-structured XML Language or Rich Site Summary (RSS) and the unstructured data such as human language, videos, and audios and the multi-dimensional data drawn from a data warehouse characterizes the data variety as big as the data volume. One of the challenges that organizations need to act on is the diversity in types of data where organizations should make a value out of the wide informational Data available today (Evans, 2011).

The most important edge in big data is streaming data, which is collected in real-time from the websites. Some researchers discussed the addition of the veracity characteristic as a fourth V of big data, which focuses on the quality of the data as good, bad, or undefined due to data inconsistency, incompleteness, ambiguity, latency, deception, and approximations (Elgendy & Elragal, 2014).

In addition to the 4 V's, Variability which is trending in social media is consider another dimension when thinking about big data. The highly inconsistent

data flows increases the velocities and varieties of data that can hamper the process of handling and managing the data properly (Bhatia & Lalit, 2016).

2.4 Big Data value chain

Demand is changing rapidly day by day and it is not easy to predict the demand of anything. Big data helps to identify and forecast the demand in a low cost and minimal time frame to support internal business decisions (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

In this century, the organizational goal is to understand the customer behavior and the market behavior in a better way in order to invest in it. This goal can be achieved by storing and analyzing greater levels of detailed transactional data, machinery generated data, and the web data and big data helps to achieve this goal (Bhatia & Lalit, 2016).

Big Data Value Chain deals with a set of activities to create value from available data. It consists of seven phases: data generation (from calls, tweets, Facebook or any other digital action), data collection (data generated can be collected or discarded), data transmission (once collected, data transferred to be stored), data pre-processing (improve the data quality required for analysis by doing integration, cleaning, and elimination of redundant data), data storage, data analysis and decision making (Bhadani & Jothimani, 2016).

Data analysis starts by collecting all data, then clear improper data and not related one, sort, cluster, and read the distance between all the points and compare to the benchmark, the international, or the national standards. Big data projects create a huge amount of transformation processes that affect all parts in the enterprise. The main problem facing almost all organizations is the integration between the current organizational systems and the new big data analytical systems and approaches recommended (Kehrer, Jugel, & Zimmermann, 2016).

2.5 Supply Chain Management

Christopher & Holweg (2011) defined Supply Chain Management as the management, across and inside a community of upstream and downstream corporations, of both relationships and streams of material, information and assets. Mentzer defines supply chain as ‘‘set of three or more entities directly involved in the upstream and downstream flow of products, services, finances, and information from a source to the customer’’ He also defines Supply chain management as “the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purpose of improving long-term performance of the individual companies and the supply chain as a whole” (Mentzer, 2001).

Previously, physical documents and details in form of information were stored, shipped, and transported with the goods themselves. Actually, supply chains have little similarity with that where supply chain is a model of technologies that synchronizes SCM and provide flow of information that enables organizations to capture, process, analyze, store, and exchange data about their operations (Rozados & Tjahjono, 2014).

Supply chain – SC is an integrated system of facilities and activities including all interrelated business functions. It is an end-to-end system that starts from ordering an item and ends by receiving this item. It is about procurement of materials, transformation of materials into its final presented products, and distribution of these products to the end user (Keshteli & Fathollahi Fard, 2018).

Supply chain management – SCM is a process of managing all the supply chain parties such as replenishment and movement of raw materials and finished goods alongside transportation decisions. Dealing with the SCM can give the organization a competitive advantage over others in the market (Keshteli & Fathollahi Fard, 2018).

Supply chain network design – SCND plays an important role in the performance of supply chain in operational and tactical levels to gain its competitive advantages. The main decisions and concerns in SCND is choosing good facilities among all potential ones and

considering the numbers and capacities of network facilities and the material flow through the network. It is a chain and any minor or major decision can affect the whole chain directly and indirectly in all its levels (Keshteli & Fathollahi Fard, 2018).

2.6 Supply Chain Management from Creation to Globalization

Globalization era starts with the creation of the trade liberalization policies and the establishment of institution such as World Trade Organization (WTO) and other international institutions that deal with global/regional trade policies (Movahedi, Lavassani, & Kumar, 2009). Globalization affects the SCM and present it in four stages which are: pre SCM stage, creation stage, integration stage, and the globalization stage (Mehmeti, 2017).

During 1950s and 1960s, the product development was very slow depending on the technology and capacity used inside the organization. In this period, SCM concept was unknown. The big concern was given to the production where massive production takes place and the monitor was only on the inventory level. At that time, the purchasing part was neglected. In 1970s, managers start talking about increase in performance, new product development, quality, manufacturing cost, and delivery time (Mehmeti, 2017).

1980 was the Creation era of the term SCM which starts when cooperative relationship between the buyer – supplier takes place and was beneficiary (Movahedi, Lavassani, & Kumar, 2009). During 1980s and 1990s, the demand was on better, faster, and cheaper logistical service. For that, manufacturers start to do outsourcing for the logistics activities and focus on their core competencies. They oriented towards making good relationship with their supplier and customer (Mehmeti, 2017). 1990 was the Integration era where the IT systems such as Enterprise Resource Planning – ERP are introduced to manage the resources of individual firms and integrated supply chain (Movahedi, Lavassani, & Kumar, 2009). It provides a push to the buyer - supplier relationship and SCM evolution. With technology and by using the internet, the relationship moves to be long-term relationship and strategic alliances (Mehmeti, 2017).

The competition differs between counties and regions. Where in the developing economies, the competition is firm – firm competition while in developed economies, it is a chain – chain competition. The latest SCM evolution was the movement towards supplier relations systems that cross the national boundaries into other regions (Movahedi, Lavassani, & Kumar, 2009).

3. METHODOLOGY:

A systematic review over the existing literature including Big Data, supply chain, SCM, and the impact of BD analytical tools on SCM. Data is collected and unsystematically interpreted from articles published in peer-reviewed journals, conference proceedings and papers, empirical or evidence-based articles in scholarly, and internet. The findings summarized in a subjective way that describes and discusses the literature from a contextual or theoretical point of view.

3.1 Big Data Analytical Tools Used in Supply Chain Management

Today's trend topic studies is Big Data in all sectors private and public and in all markets. It influences our lives and creates new challenges for citizens, employers, employees and customers and as well as governance. For organizations, the information systems, applications, social media platforms, smart devices, and internet of things that uses high technology creates the organizational big data that should be stored, sorted, and organized to be a useful source of knowledge to optimize their business (Kehrer, Jugel, & Zimmermann, 2016). The electronic data and data warehouse will save every detailed record and transaction performed on the personal and organizational level. Without electronic data, transactions and records will not be safe and will be lost directly after use. Thus losing the opportunity and advantage to extract valuable information and knowledge to perform detailed analyses (Elgendy & Elragal, 2014).

The study is in the analysis process to reveal hidden correlations from massive data that is known as big data analytics. The era that we are currently living is the information one where huge varieties of high velocity data produced on daily basis and the intrinsic details lays within a pattern of hidden knowledge that should be extracted and utilized. The big data value can be provided using advanced big data analytics techniques. For that, using big data techniques, tools, and governance processes can identify false transactions and recover it and increase the speed detection of compliance patterns within all available data sets. Thus, big data analytics influence business change and develop decision making, by applying such advanced analytic techniques that reveals hidden insights and valuable knowledge (Elgendy & Elragal, 2014).

Information is considered the fuel of the big data where the important reason behind generation and existence of big data is the collection and analyses of information. The world is changing to digitization and converting the process of analog information into discrete, digital and machine-readable format which characterizes the big data. But when converting already existing printed materials into digital one, this forms the massive digitization. One of these mass digitization projects was the google print library project that started in 2004 to digitize more than 15 million volumes held in multiple university libraries, including Harvard, Stanford and Oxford. Datafication is about putting a phenomenon in a quantified format so that it can be tabulated and analyzed. Datafication came after digitization. It aims is to form digitized version of analog signals in order to create insights that would have not been incidental while signals were in their original form. Technology is the tool of big data. Moreover, specific technology within specific systems is the equipment of data utilization (De Mauro, Greco, & Grimaldi, 2014).

The data size is calling for a new set of techniques that have the power to process the large volume data. The main big data challenges are to understand the available data and protect it in form of security to be timely available and accurate in good quality. These challenges can badly affect the business and its impact can be in time delay of the product and its quality (Bhatia & Lalit, 2016).

Big data analytical tools are Hadoop, MongoDB, Cloudera, Teradata, Qubole, BigML, Tableau, CartoDB etc.. But the most important and most widely used tool for big data analytics is Hadoop. Large companies are using the Hadoop, which is a new open source framework, and MapReduce to store, analyze, and process large volumes of structured data and unstructured data such as the Web data or any typical data that includes the data in batch jobs stored and retrieved from database servers (Bhatia & Lalit, 2016).

Processing Methods go beyond statistics and traditional methods. It has the potential of transforming big data into values of individual behaviors but it requires specific skills that are hard to find in today's job marketplace. Big Data Analytical Methods include: A/B testing, Association rule learning, Classification, Cluster analysis, Data fusion and data integration, Ensemble learning, Genetic algorithms, Machine learning, Natural Language Processing, Neural networks, Network analysis, Pattern recognition, Predictive modelling, Regression, Sentiment Analysis, Signal Processing, Spatial analysis, Statistics, Supervised and Unsupervised learning, Simulation, Time series analysis and Visualization (De Mauro, Greco, & Grimaldi, 2014).

Another tool for big data is MangoDB database management system which is a data storage and management system tool alternative to Relational Database Management System where only unstructured and semi-structured data used and when data is changed frequently (Bhatia & Lalit, 2016).

3.2 Impact of Big Data on Supply Chain Management

Today, Organizations are going smart and digital in all its elements. Using the RFID, GPS, wireless sensors network, and location based information helps the organizations to convert from existing manual supply chain system into open, flexible, agile, and digital models. Digital supply chains allow organizational flexibility, automation business processes, and digital management of corporate resources (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

When big data is accurate, it gives organization a better assistance on the information they get. However, some issues like analysis, capture, search, sharing storage transfer, querying, and information privacy of large and complex data volume prevents the traditional applications from handling or processing it (Bhatia & Lalit, 2016). The supply chain that uses internet enabled capabilities is called a digital supply chain. It can increase the overall performance by: analyzing the data and information, monitoring the customer interaction with items in details, having real time inventory level, specifying item location in warehouse and shelfs (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

Big data in supply chain management supports and reveals the customer demand in planning strategies by collecting, documenting & analyzing data in a real situation. The use of digitized supply chains will dramatically lower costs and have the potential to reduce lead-time and increase product availability. Digitization increases the supply chain effectiveness by exchanging information and knowledge with collaborating suppliers. Supply chains are combining data from different systems to coordinate activities across the supply chain end-to-end. Amazon depends on big data to monitor, track, and secure about 1.5 billion inventory items laying in 200 warehouses around the world. They also relay on big data to predict when the customers will purchase the products and what products in order to pre-ship the items to a near destination port and schedule the anticipatory shipping. Each hour, Wal-Mart customers produce about one million transaction that generates 2.5 petabyte in data size. This data size is expected to reach about 7 terabytes everyday if Wal-Mart uses the Radio Frequency Identification (RFID) on its items (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

All organizations over the entire world believe in technology and forecasting high expectations from Big Data Analytics in supply chain, however, the actual use of it is limited. The interaction between Big Data Technologies and Supply chain analytics is the concept that will change the supply chain management (Rozados & Tjahjono, 2014).

The supply chain is about four main activities: buy, sell, move and store. These activities linked with four main SCM departments: procurement, marketing, transportation and warehouse operations. Most of the SCM Big Data generated in an unstructured format that cannot be analyzed using traditional IT tools (Rozados & Tjahjono, 2014). Big data can extremely add values to the overall supply chain operations to become more efficient based on the analysis results. For example, the marketing demand captured and tracked using the Point of Sale (PoS) data, GPS transponders provides data to the transportation, RFID data identifies inventory items and electronic data sends automatic buying orders. Marketing is the supply chain unit that uses big data to create huge amount of information flowing in the chain upstream. Also big data will help in doing behavior analysis that leads the marketers to the customer's behavior and perception (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

Procurement is a complex process at the upstream supply chain level that depends on thousands transactions when collecting global data. It needs strong connections with internal finance and external suppliers measuring clear and visible data. The warehouse inventory management will be accurate and in real time by using the automated sensing

capabilities in RFID which leads to optimization in stock ranges and maintenance in manufacturing unit. Transportation analysis also help in directing the vehicles using the Origin-And-Destination (OND) and logistics network topology (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

In the supply chain management, big data analysis will balance the estimated demand change with the supply. Many parties benefit from this data such as the manufacturing, retail, and logistics and transport industries. Organizations can also benefit from big data to automatically replenish the decisions that will minimize costs, reduce lead times and delays. Furthermore, organizations analyze data to identify the root causes of cost, to monitor the supplier performance depending on quality, price, and delivery, and to provide better planning and forecasting. This ends with inventory reduction and increase in profit margin (Elgendy & Elragal, 2014).

In manufacturing industries, the manufacturing processes used big data to minimize the performance variability, reduce cost, and increase profitability by improving and standardizing the quality of goods and services provided. The predictive analytics on big data can provide early manufacturing alerts and prevent presence of defects in goods. Thus identifying any disruption in the production process before it occurs and damages the items produced to save time and significant expenditures. Furthermore, in the manufacturing industry, machine logs are part of the big data that can be monitored and analyzed on real time and enable the manager or decision maker to swift to another alternative production way (Elgendy & Elragal, 2014).

The big data influence supply chain management and convert it into a digital supply chain management. This enforces all industries to invest in technology to innovate and succeed. Contemporary organizations seek a core competence that can improve their competitive advantage and may be to have a global competitive position. Some of these contemporary organizations think about expanding their operations nationally and internationally to increase the profitability and to sustain in the market. Others use technology and depend on it to increase their accuracy and effectiveness and the efficiency in reducing cost to increase their profitability. Any local organization can change its traditional production process and move towards using of technology to end with a full automated industry that can be fully controlled in its all the business parts and project steps and stages.

Big Data is a combination set of massive, large, and complex data or data sets that are high in variety and velocity and very difficult to be analyzed using traditional tools, applications, software, and techniques. This complexity can be simplified by using new techniques with different platforms and algorithms and convert this huge data into useful materials and real time data that can be helpful in decision making and managing complexity by extracting the hidden values (Parameshwaran, 2017).

In order to succeed and gain the competitive advantage in the market, companies have to know and understand the customers' needs and wants in order to relay on it. Thus, they should analyze the collected data. The data used nowadays in supply chain management are voluminous, versatile, fast, and sensitive. The impact of big data in supply chain is so great because it provides the suppliers within the network with high data accuracy, clarity, and greater insights that can be shared across the supply chain. The data has a significant role in several supply chain and logistics operations decisions in business (Tahiduzzaman, Rahman, Kumar Dey, Rahman, & Akash, 2018).

Everyday new sets of huge amount of data collected and stored and thus forming the big data. But I think the future will be moving towards a form a huge data. This is because of the huge queries of social media.

Beside all the mentioned added values that Big Data provide to SCM, we can address numerous difficulties such as the data quality, security, and privacy. Also the availability of data collected can be limited and will be prevented from the competitors in the market. This is because the huge data can be considered with high value that will be analyzed to understand unexpected actions such as customer behavior. The analysis of the big data can help businesses in taking effective and efficient decision in a proper time and a rapid way

which leads to greater operational efficiencies and enhance customer experience to reduced risk.

The big data challenge is to extract values from complex data that are accurate and leads to more confidence in decision making which results in greater performance, greater efficiency, increase productivity, reduce cost being cost effective, and reduction of risks (Bhatia & Lalit, 2016).

4. CONCLUSION

Big data is much powerful than people realize. Big Data is changing the world; its impact is extended and diffused between companies and spreading to the society and through to the global. The accessibility of information and the exclusive control over data sources gives the data holder a dominant position and power and restrict competition in the marketplace by preventing marketers from accessing the data, which is unfair information barriers. Thus, the information splits and classified the companies as information rich and data lacking ones, which leads to a new digital divide that will slow down innovation in the sector (De Mauro, Greco, & Grimaldi, 2014).

Big data analytics become a core differentiation factor for any organization that acquire it in the last few years. The management of organizational and data integration aspects are an essential success factor and preliminary stage for big data analytics (Kehrer, Jugel, & Zimmermann, 2016). For that, specific policies should be lunched to prevent social media companies from the exclusive holding of social individual information and data is likely to become a new dimension to consider within antitrust regulations (De Mauro, Greco, & Grimaldi, 2014).

Big Data will improve the supply chain visibility and reliability, improve customer experience, increase the demand forecasting accuracy, provide high manufacturing efficiency, hold better inventory deployment and planning, and provide professional digital collaboration with the supply chain stakeholders.

Now, supply chains are no longer linear systems, but are characterized by network structures with autonomous and heterogeneous members. And the technology can help you to see all the world and contact it from one screen. Indeed, companies are involved in a worldwide industry evolution where everything in this business is rapidly changing. The change occurred in the products and services. The supply chain is at the center of this massive change where the SCM encourages companies to go for out sourcing in Low Cost Country Sourcing and to choose the best-cost-country sourcing.

In addition to the forecasting of bandwidth, big data analysis can response to customer behavior. Analyzing big data is not easy at all and require various analytics, data brokers, software and applications vendors, expert IT, and solutions consultants to make these data valuable. For that most of the non-IT companies ask for a third party solution providers to help in this issue or to handle it. Such companies outsource this activity to a third-party analytics provider (3PA). This third party provider is similar to third-party logistics providers (3PLs) who manages the movement of physical goods, these companies coordinate and make sense out of large data flows (Sanders, 2014).

The integration of Big Data and SCM will end with global suppliers and global customers. As a result of Digitalized SCM, the production systems are automated and standardized in a high quality performance. And in order to succeed in the market, companies should have competitive advantage over others in the market and to carry the cost. Companies in different industries will start thinking about moving towards undeveloped areas like Africa where the raw materials are available in low cost and the presence of cheap labor. This will have it direct effect on the destination economy where these international firms can open new work opportunities to the population and the unemployment rate will decrease and the cost will be reduced. Thus the global economy will be influenced by the global business trends and the SCM evolution leads to revolution in the all industries. Almost all the organizations uses the SCM in order to reduce the cost and increase the profits. Nowadays we can talk about another benefit of SCM which is

saving the environment and reducing the pollution as a result of production (Keshteli & Fathollahi Fard, 2018).

REFERENCES

- Bhadani, A., & Jothimani, D. (2016). Big Data: Challenges, Opportunities and Realities. *In Singh, M.K., & Kumar, D.G. (Eds.), Effective Big Data Management and Opportunities for Implementation.*, (pp. 1 - 24). Pennsylvania,USA, IGI Global.
- Bhatia, K., & Lalit, D. (2016, May). A review paper on Big Data Analytics. *IJRET: International Journal of Research in Engineering and Technology, 05*(05), 340 - 344.
- Boyd, D., & Crawford, K. (2012). Critical Questions for Big Data. *Information, Communication & Society, 15*(05), pp. 662 – 679.
- Chen, H., H. L. Chiang, R., & C. Storey, V. (2012, December). Business Intelligence and Analytics: From Big Data to Big Impact. *MIS Quarterly, Special Issue: Business Intelligence Research, 36*(4), 1165-1188.
- Christopher, M., & Holweg, M. (2011). Supply Chain 2.0: managing supply chains in the era of turbulence. *International Journal of Physical Distribution & Logistics Management, 41*(1), 63 - 82.
- De Mauro, A., Greco, M., & Grimaldi, M. (2014). What is Big Data? A Consensual Definition and a Review of Key Research Topics. *4th International Conference on Integrated Information.* Andrea De Mauro.
- Elgendy , N., & Elragal, A. (2014). Big Data Analytics: A Literature Review Paper. *Lecture Notes in Computer Science · August 2014* (pp. 214–227). Cairo, Egypt: Department of Business Informatics & Operations,German University in Cairo (GUC).
- Evans, D. (2011, April). The Internet of Things - How the Next Evolution of the Internet is Changing Everything. *CISCO white paper*, 1–11.
- *Internet users in the world by regions*. (2021, March 31). Retrieved January 16, 2022, from Internet World Stats: Usage and Population Statistics: https://www.internetworldstats.com/stats.htm
- Kehrer, S., Jugel, D., & Zimmermann, A. (2016). A Systematic Literature Review of Big Data Literature for. *Digital Enterprise Computing 2016, Lecture Notes in Informatics (LNI)* (pp. 209 - 220). Kehrer, Stefan.
- Keshteli, M. H., & Fathollahi Fard, A. M. (2018, February 27). Sustainable closed-loop supply chain network design with discount supposition. *Neural Computing and Applications*.
- Mayer-Schönberger, V., & Cukier, K. (2013). *Big Data: A Revolution That Will Transform How We Live, Work, and Think.* London: Murray, John.
- Mehmeti, G. (2017). A Litrature Review On Supply Chain Management Evolution. *Agricultural University of Tirana, Albania*. Mehmeti, Gentjan.
- Mentzer, J. (2001). Defining Supply Chain Management. *Journal of Business Logistics, 22*(2), 1 - 25.
- Movahedi, B., Lavassani, K., & Kumar, V. (2009). Transition to B2B e-Market place Enabled Supply Chain: Readiness Assessment and Success Factor. *The International Journal of Technology, Knowledge and Society, 5*(3), 75 – 88.
- Parameshwaran, N. K. (2017, Nov). Big data – A Review. *International Research Journal of Engineering and Technology (IRJET), Volume: 04*(Issue: 11), 1652 - 1655. Retrieved June 2019
- Rozados, I., & Tjahjono, B. (2014). Big Data Analytics in Supply Chain Management: Trends and Related Research. *6th International Conference on Operations and Supply Chain Management.* Bali: Benny Tjahjono.
- Sanders, N. R. (2014). *Big Data Driven Supply Chain Management: A Framework for Implementing Analytics and Turning Information into Intelligence*. (1. st, Ed.) Pearson Education LTD.

- Tahiduzzaman, M., Rahman, M., Kumar Dey, S., Rahman, M., & Akash, S. (2018, March 24). Big data and its impact on digitized supply chain management. (M. Rahman, Ed.) *IJRDO-Journal of Business Management, Volume-3*(Issue-9), 196 - 208.
- Thomas, M. (2015, Dec). A Review paper on BIG Data. *International Research Journal of Engineering and Technology (IRJET), 02*(09), 1030 - 1034.