Literature Review: The Emergence Of Big Data In Business

I. Introduction:

In this digital age we live in today, corporate businesses are continuing to search for the safest, fastest, and most efficient technology in order to satisfy their customers. Of all the recent technology advances which have emerged over recent years, none may be more beneficial but at the same time more challenging than big data analytics. The term, “Big Data” or BD, is a term used to describe a collection of data sets so large and complex that it becomes difficult to process using conventional data techniques and tools (Balachandran & Prasad, 2017). On the other hand, analytics generally refers to tools that help find hidden patterns in data (Erevelles et al., 2015). As data become larger, more complex, and more inexplicable, the limited capacities of humans pose difficulties in deciphering and interpreting an unknown environment. The volume of Big Data is currently measured in petabytes, exabytes, or zettabytes. One petabyte is equivalent to 20 million traditional filing cabinets of text. As a result of firms’ efforts to rein in the challenge of ever-increasing Big Data volume, the global market for software, hardware, and services for storing and analyzing Big Data is expected to double in size every two years” (p. 898). Moreover, 32 billion objects are expected to be connected online by 2020 (p. 898). Therefore, it is essential for business professionals, especially those in high positions to understand not only the current state of big data but also how it will affect businesses in the future. This leads to the question, how has big data affected how financial institutions operate on a daily basis and why has it become such a quickly moving trend? And how have Big Data and Big Data tools affected the processing efficiency of Equity loans and customer satisfaction? This literature review will discuss the impact of Big Data on financial businesses both positively and negatively, the privacy and security concerns, and the future outlook of Big Data, plus provide examples of how big data has transcended not only IT, but business as well.

II. Background:

Big data is data that exceeds the processing capacity of traditional databases. The data is too big to be processed by a single machine. The evolving field of big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights (Balachandran & Prasad, 2017). Due to recent technological development, the amount of data generated by the internet, social networking sites, sensor networks, healthcare applications, and many other companies, is drastically increasing day by day. All the enormous measures of data produced from various sources in multiple formats with very high speed is referred to as big data (Jain et al., 2016). Jain’s description of the term “big data” perfectly explains in layman’s terms just exactly what big data entails.

Moreover, the term Business Intelligence (BI) is often mentioned when on the topic of big data and relate to each other. Business intelligence was proposed earlier than big data and can be described as an automatic system that disseminates information and supports decision-making processes (Liang & Liu, 2018). On the other hand, Balachandran and Prasad (2017) refer to business intelligence as technologies, applications and practices for the collection, integration analysis and presentation of business information (p. 1112). The main purpose of Business Intelligence is to support better and faster business decision making and organizations are

being compelled to capture, understand and harness their data to support decision-making in order to improve business operations. The definition of Business Intelligence that Liang & Liu (2017) provide seems too general and to some degree, outdated. However, Balachandran and Prasad's (year) definition provides a more professional and business description of ways in which data is utilized.

To better understand what just what Big Data entails, it is best to start by examining just what Big Data is comprised of. There are three V's which characterize Big Data and are common to experts in the field. Those three being volume, velocity, and variety. BD is defined by dataset size and the challenges these data place on computing capacity (Merendino et al., 2018). Variety refers to heterogeneity of data types, representation, and semantic interpretation. Velocity denotes both the rate at which data arrive and the time frame in which they must be acted upon (Jagadish et al., 2014). Other additions such as veracity have been proposed but we shall see if this will be a concern in the future.

III. Impact of Big Data on Corporate Business Operations:

According to Merendino et al. (2018), the sudden rise of BD as a new knowledge source has prompted corporate decision-makers to make decisions more rapidly and to shape their capabilities to proactively address environmental changes (p. 67). Big data analytics would definitely lead to valuable knowledge for many organizations. Business operations and risk management can be beneficiary as there are many data collection channels in the related industrial systems including wireless sensor networks and internet-based systems, to name a few (Choi et al., 2017). In Merendino's research he and his fellow authors conducted a study to explore whether Big Data has changed the process of board level decision-making and, if so, how and to what extent. Through interviews, they pointed to areas for development relating to three core categories of individual directors, the board, and external stakeholders of organizations (p. 92). Through their findings, they concluded that boards need to develop their own cognitive capabilities at an individual level, find new ways to make strategic decisions to meet the temporal and other challenges BD brings, and work in new ways, both across the organization and with external stakeholders who have valuable BD capabilities (p. 74). However, their research methodology lacks diversity in the type of test samples chosen. Meaning, their interviews were given to directors of UK-based global manufacturing and servicing organizations, rather than choosing directors and business executives from a wide range of firm types and industry sectors.

Similarly, Choi et al. (2017) conducted their own study on how Big Data affects business operations and decision-making from high level management. In contrast to Merendino et al.'s (2018) methodology, the formers' methods mainly consist of reviews of various model systems and technologies of various model systems. Choi et al. (2017) found that if companies tend to believe that the cost of retaining is zero or almost zero, they will keep a lot of redundant data without any careful planning, which in turn, would lead to poor data-driven decision making in real operations (p. 87). They were able to conclude that data-driven approaches would be a growing research methodology in business operations (p. 89). While Merendino et al. (2018) believe that making business decisions to adapt with the challenges BD brings starts with the individual leaders at hand. Choi et al. (2017) on the other hand, believe that making important business decisions relies on data mining algorithms and is very application-oriented. However, while leadership and business decisions made in regard to Big Data begin with leadership

personnel, the problem with their study is that each individual interviewed has their own personal agendas which could skew some responses. In regard to Choi et al.'s (2017) article, due to the size and nature of the data involved in Big Data, it may be smart and beneficial to focus on the types of computing techniques and applications used to handle BD. My only concern is if there would be enough focus on the security and privacy of data.

IV. Privacy and Security Challenges:

With emerging technological advances and processes, there is always a concern with privacy and security of confidential information. This is especially true whenever on the topic of Big Data. It is important to know the difference between privacy and security. Data privacy is focused on the use and governance of individual data. Security concentrates more on protecting data from malicious attacks and the misuse of stolen data for profit (Jain et al., 2016). Security is one of the major concerns with big data. To make more sense from the big data, organizations would need to start integrating parts of their sensitive data into bigger data. To do this, companies would need to start establishing security policies which are self-configurable: these policies must leverage existing relationships, and promote data and resource sharing within the organizations, while ensuring that data analytics are optimized and not limited because of such policies (Balachandran & Prasad, 2017). In regard to concerns with Big Data and data quality, accuracy and timely availability of data is crucial for decision-making. Big data is only helpful when an information management process is implemented to guarantee data quality (p. 1119). When it comes to data storage, data storage devices are becoming increasingly important, and many cloud companies pursue big data capacity of storage to be competitive (p. 1119). Balachandran & Prasad (2017) provide valid points when explaining the various challenges dealing with Big Data. However, not much is mentioned about what corporate businesses can do to best prepare for a possible security breach or when faced with a difficult problem. If they had mentioned a few safety measures and best practices for companies to take, it would have emphasized more just how serious to take these potential threats.

Similarly, Nir Kshetri (2014) believes accurate and actionable data require considerable technical skills to handle data mining and analysis methods and systems. The lack of human resources and expertise represents another barrier to the implementation of BD projects (p. 12). He explains how the challenges in Big Data could heavily affect many industries, especially the agriculture industry. For instance, there is a lack of appropriate database systems for agribusiness development, agriculture management, and produce distribution. A Big Data attempt is greatly hampered by the lack of reliable infrastructure to collect information (p. 12). Furthermore, while large growers can afford specialized machineries, small farmers are not in a position to do so. The conditions that stimulated the growth of Big Data in the US farming industry such as the widespread adoption of mechanized tractors, genetically modified seeds, computers, and tablets for farming activities are less prevalent in developing countries (p. 12). Kshetri (2014) thoroughly explains the emerging role of Big Data in key development issues, along with the challenges and concerns. However, a limitation is that some of his arguments rely on the reports of companies which are consultants of BD-related developmental agencies promoting Big Data. Therefore, it raises the possibility of these companies overemphasizing the positive aspects of Big Data. Hence, Balachandran & Prasad's (2017) article more effectively highlight the concerns and challenges regarding the use of Big Data.

V. Future Outlook of Big Data:

Big Data is going to continue playing an important role for businesses moving forward. We have entered an era of Big Data. Many sectors of our economy are now moving to a data-driven decision-making a model where the core business relies on analysis of large and diverse volumes of data that are continually being produced (Jagadish et al., 2014). This data-driven world has the potential to improve the efficiencies of enterprises and improve the quality of our lives. However, there are a number of challenges that must be addressed to allow us to exploit the full potential of Big Data (p. 94). Jagadish et al. (2014) highlights key technical challenges concerning Big Data. However, they fail to acknowledge other challenges, such as economic, social, and political, that should be addressed as well. If they had covered challenges from other than the technical aspect, it would be more beneficial to businesses because these different aspects can affect businesses as well.

Likewise, Erevelles et al. (2015) see a promising future for Big Data moving forward. Big Data is a new source of idea generation for product development, customer service, shelf location, distribution, dynamic pricing, and so on. In a hyper-competitive marketplace where ideas are easily copied, a firm must enhance its speed of idea generation to achieve a sustainable competitive advantage; Big Data may enable firms to accomplish such a desirable goal (p. 903). Furthermore, Marketers are starting to recognize the potential power of Big Data as a new capital and that access to Big Data offers a firm new way to differentiate its products (p. 903). Erevelles et al. (2015) describe in detail the future implications Big Data can have on business firms, especially in terms of marketing. However, more emphasis could have been placed on the resources businesses need to handle Big Data in the future and how to sustain it.

VI. Conclusion:

From the articles mentioned in this literature review, there is much to look forward to regarding Big Data, but also much to prepare for. Big Data has already made a positive impact on companies and will continue. In doing so, more assumptions and theories will continue to emerge. For example, knowledge extraction and incorporation is currently considered to be beneficial for efficient Big Data analytics (Barba-Gonzalez et al., 2018). The collection of data on citizens through digital portals is viewed by organizations as an opportunity to create value, leverage competitive advantage, and maximize productivity and efficiencies in service and product delivery (Jurkiewicz, C. 2018). Merendino et al’s (2018) and Choi et al’s (2017) articles showed me how Big Data has affected corporate leaders make important business decisions influenced by Big Data. While Jain et al (2016) and Nir Kshetri’s (2014) articles highlighted security and concerns of Big Data and the security measures businesses should take. Jagadish et al’s (2014) and Erevelles et al’s (2015) articles provided insight on the future implications of Big Data moving forward. By gaining more insight on security concerns and the benefits and challenges of Big Data, these articles can all contribute to my own recommendations on Big Data and future projects.

Research Method

My research topic, Exploring the effect of Big Data and its tools on Equity loan processing efficiency and processing times, will investigate how Big Data and the technologies used to analyze Big Data has an effect on processing an equity. I have chosen quantitative

methodology for my research in terms of a questionnaire/survey. I plan on focusing on Equity loan processors, both male and female from a single financial institution as my test subjects, asking them a series of questions relating to the influence of Big Data and Big Data tools/technologies used to process an equity loan. From there, I will test the results against my hypotheses of “If effective tools and technologies are being used to analyze Big Data, then the time it takes to process an equity loan will be less than 35 days” and “If Big Data tools are being used throughout the loan, then it will lead to a more efficient loan process.

With the data I have collected I will analyze the results by cross-tabulating and filtering my results to model my data and set benchmarks. I will then analyze averages with the data collected in regards to a question about Big Data. This will allow me to draw conclusions about Big Data and its tools in regards to effectiveness, usage, and availability, and whether or not equity loan processing efficiency is affected by the use of Big Data tools. I will look for patterns in processing times in equity loans of processors who choose to use Big Data tools and those who do not. During the collection process, I will look for additional sources to find a few researchers who have done similar work. I will need to think of questions that are fair to all, avoiding any biases which can possibly occur. I will rely on my scholarly sources that I have previously gathered to help me formulate questions about Big Data regarding privacy and security, its impact on daily business operations, and its future outlook.

In this research there are some limitations. The first limitation is sample size. I need to choose the right amount of people to give the questionnaire to in order to have enough data to analyze. At the same time, I do not want an overload of questionnaire results, which would be time consuming. Second, I need to consider that work may get in the way and plan accordingly to give my subjects ample time to complete the questionnaires honestly. Third is the difference in understanding and interpretation. Each person may have different interpretations of my questions so I will need to make sure they are easy to understand to ensure each individual has the same understanding.

Once all the data is gathered and analyzed, I plan on comparing the results with my two hypotheses to determine what effect Big Data tools and technologies have on equity loan processing efficiency and processing times. With assistance from scholarly sources I have gathered previously and guidance from my mentor, I hope to gain a better understanding of Big Data and its importance in business and IT.

Conclusion

The aim in this research project is to explore the questions of how has Big Data affected how financial institutions operate on a daily basis and why has it become such a quickly moving trend? And how have Big Data and Big Data tools affected the processing efficiency of Equity loans and customer satisfaction? In recent years Big Data has become a huge breakthrough in not only the Business industry, but also the IT industry as well. However, some professionals in the industry may not know just how much Big Data affects their jobs on a daily basis. Focusing on a single financial industry which integrates both business and IT fields, as this research project does digs deeper into Big Data by analyzing how it affects processing efficiency of Equity loans and customer satisfaction. By using a questionnaire to interview equity loan processors and supervisors, I will be able to analyze just how vital Big Data and its tools are in order to process an equity loan. The extent to just how much Big Data has an effect on equity

loan processing will remain to be seen.