CHAPTER – 2

REVIEW OF LITERATURE

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LITERATURE REVIEW

2.1 BUSINESS INTELLIGENCE SYSTEM & BIG DATA ANALYTICS:

According to Ahmed A.A. Gad-Elrab (2021) in the contemporary business landscape, Business Intelligence (BI) technologies have gained widespread adoption across various industry domains, guiding decision-making processes to create value. BI encompasses the method of extracting, analyzing, and predicting vital business insights from available datasets. Traditional BI primarily focuses on the collection, extraction, and organization of data, enabling proficient query processing to derive insights from historical data. However, with the advent of technologies like big data, the Internet of Things (IoT), artificial intelligence (AI), and cloud computing (CC), BI has evolved into a more crucial and significant process. This evolution has captured the attention of both business professionals and academic researchers, emphasizing the growing importance of BI in the modern business landscape.

Gurcan et al. (2023) study involved an extensive review of research papers pertaining to business intelligence systems (BIS) and their intricate dynamics. Their analysis revealed a rich landscape of research in this field, encompassing various aspects and subtopics. Notably, the study identified 36 distinct topics, each delving into different facets of BIS. These topics included areas such as "Organizational Capability," "AI Applications," "Data Mining," "Big Data Analytics," and "Visualization," among others. Authors provided a comprehensive overview of the multifaceted research landscape surrounding BIS. Their work not only highlighted the diverse areas of investigation but also contributed by synthesizing valuable information on the latest developments and future directions within the realm of business intelligence systems.

Nenonen et al. (2022) underscored the critical role played by Business Intelligence Systems (BIS) within organizations. They emphasized that BIS functions as a foundational element, enabling organizations to efficiently store, manage, analyse, and leverage data. Through these capabilities, organizations can extract valuable insights and utilize them to innovate, develop new products, and deliver enhanced services. Authors perspective accentuates the pivotal position of BIS in modern businesses, where data-driven decision-making is paramount for sustained growth and competitiveness.

A system is made up of a number of connected parts that work in concert to produce certain results (Satzinger et al, 2002). According to Laudon & Laudon (2007) and O'Brien (2003), an IS is a group of interconnected components that gathers, processes, stores, organises, retrieves, manages, and provides information to support business operations, decision-making, and performance inside an organisation. It varies from information technology in this sense, which describes the tools, techniques, innovations, and standards used to create information (Kroenke, 2007). Information systems are crucial in assisting managers in solving problem, difficult concepts visualising, and new product development (Laudon and Laudon, 2008).

According to Yahaya et al. (2016) it is crucial and necessary to use business intelligence (BI) and big data analytics (BDA[1]) to manage organisational performance, particularly in the public sector. A nation and its people might be severely impacted by poor management of the implementation plan and performance. Therefore, BI and BDA integration are essential to help decision-makers improve the efficiency of public services. Inefficient performance in management practise was found to be caused by the inadequate use of BI and business analytics with OPM[2], according to preliminary research. The research proposes integrating business intelligence and big data analytics (BI-BDA) for Operations Performance Management (OPM). This integration is crucial as a substantial volume of data from diverse sources has shifted towards big data analytics. The study aims to identify specific implementation elements and sub-elements focusing on big data analytics within the context of integrated BI-BDA and OPM. The primary outcome of this research is the development of a new integrated framework called BI-BDA for OPM in the public sector. This framework is designed to enhance the dynamism and effectiveness of the OPM system, providing valuable support for stakeholders and practitioners.

Firican (2017) offers the following seven additional characteristics for the current big data scenario:

- Variability is the measure of how many data points are inconsistent due to the abundance of data variables and dimensions originating from several dissimilar data kinds and sources.

[1]Big Data Analytics
[2]Organization Performance Management

- When discussing meaningful analysis, veracity refers to the provenance or dependability of the data source.
- Validity describes how well the data is accurate and suitable for the purpose for which it is being used. & the term "vulnerability" refers to the data source's security issues.
- The standards for data availability and currency are referred to as volatility.
- Visualization refers to the structure and presentation of data analysis findings.
- Value is the significant context that the data source provides.

According to Ayokanmbi, Fola, and Sabri, Mustafa (2021), Embracing Industry 4.0 technology is imperative in fostering a culture grounded in facts and data, leading to exceptional performance. The proliferation of digital devices such as mobile phones, social networks, computers, and wearables generates vast volumes of data. Achieving performance enhancements relies heavily on adept management, efficient utilization, thorough analysis, and meaningful interpretation of this data to bolster strategic operations. Data, essentially raw facts, undergo processing to yield insights and knowledge essential for decision-making. A robust data-driven decision support system necessitates not only copious amounts of data but also effective methodologies for extracting pertinent information. Integrating data science into organizational workflows through digital transformation becomes pivotal for optimizing operations and procedures. Big Data Analytics (BDA) emerges as a powerful tool, enabling the extraction of value from extensive datasets, thereby elevating the standard of decision-making. In the study, the author delved into the impact of big data and advanced analytical techniques on decision-making quality, ultimately enhancing organizational performance towards achieving excellence. Attaining performance excellence involves synergizing big data analytics proficiency with organizational resources and competencies. Efficient methods of extracting meaningful insights from vast data sets empower strategic decision-making, paving the way for both performance excellence and a competitive edge in the evolving business landscape.

According to Dyche (2014), Big data essentially refers to vast volumes of data that technology enables us to process, transforming it into valuable insights for various individuals. Its true essence lies in the effective utilization of data in specific domains through technological means. This concept came to the forefront in the early years of the

21st century and found initial traction among internet-based and emerging businesses. Big data encompasses a diverse range of data types, including speech, text, log files, images, and videos, as highlighted by Davenport and Dyche in 2013. The proper harnessing of this extensive data leads to the creation of numerous applications that significantly contribute to decision-making processes. By extracting meaningful information from large datasets, big data applications empower businesses and individuals alike, shaping a new paradigm for data-driven insights.

Author Yanfang et al. (2021) emphasizes the pivotal role of business intelligence in extracting vital insights from unstructured data, transforming it into actionable knowledge for informed policy decisions and heightened business productivity. Overcoming challenges such as plan failure, lack of preparedness, resource limitations, and risk-taking abilities is imperative for businesses leveraging business intelligence. The author proposes the Optimized Data Management Utilizing Big Data Analytics (ODM-BDA) paradigm as a solution to enhance organizational intelligence and decision-making. This framework incorporates a backtracking mechanism to address plan failures and improve risk-taking capacities. Additionally, the ODM-BDA framework integrates a steep optimized method to refine training plans and optimize expenditure. To validate the efficacy of these models, the study relies on a comprehensive dataset, ensuring the relative efficacy and performance of the proposed framework. The research employs simulation analysis, encompassing true positive analysis, performance evaluation, error assessment, and accuracy analysis, to demonstrate the reliability of the suggested framework. Through this approach, businesses can enhance their decision-making processes, making them more resilient in the face of challenges and better equipped to take calculated risks.

A novel platform was suggested by Castellanos et al. (2021) to alert company managers to circumstances that could have an impact on their operations. SIE[3]-OBI[4] combines the components needed to take advantage of relevant, fast-moving information on the internet. They put up fresh ideas for gathering and connecting data from the web with the previous data kept in the data warehouse to derive position trends. Only two or more separate unstructured data sources—typically one stream of internal slow text and one stream of external rapid text—are used to extract the pertinent data. This platform was created to

[3]Streaming Information Extraction
[4]Operational Business Intelligence

produce slow and rapid data streams that incorporate ordered and unorganised flows and to evaluate them nearly instantly.

The goal of Chapmana and Kihnb's (2008) study was to quantify how the resources and capabilities of information systems affect company performance. The complicated interrelationship between information system integration methodologies has been shown in the literature. In their study, the authors focus on the data architecture component of information system integration, specifically the single database concept. They argue that while this integration aspect should influence the perception of system success, there isn't substantial evidence connecting it to business unit performance due to the varied ways information is utilized in practice. The researchers employed coercive and enabling organization, finding that an enabling management control approach is facilitated by the level of information system integration. They establish a connection between the perceived success of the system and the performance of the business unit.

According to Jehad S. Bani-2009 Hani's research, Jordanian universities with a business college looked at the effects of MIS on firms' performance from an academic standpoint. All deans and department heads for the business faculties at public and private institutions in Jordan made up the study's target group. The targeted universities were divided into a simple random sample of (15) universities, and 120 questionnaires being distributed among eight different universities). Response rate was about 70% and statistical techniques like the Spearman correlation-coefficient and regression being used to test the hypothesis. Additionally, results demonstrated that management information systems had a big influence on how well a business performed. The researchers provide a few intriguing suggestions for the administration of Jordanian institutions in the last section.

Computer hardware, software, data, processes, and people are the five basic elements of an information system. From the simplest to the most complex information systems, all have these five elements. These five elements are balanced. Hardware and people, the final elements, are both actors and have the ability to act. Both the software and procedure components are collections of instructions: the former are meant for humans, while the latter are meant for hardware. Finally, data serves as a link between the computer and human worlds (Kroenke, 2007).

Humans are inherently social beings, reliant on connections with others to fulfill their needs and desires. The idea of self-sufficiency is unrealistic due to the limitations in capacity, time,

strength, and skills that each individual possesses. In this context, an organization can be defined as a gathering of people united by specific goals. This concept isn't recent (Diksha, 2017); organizations have historically formed as collectives driven by continuous pursuit of particular objectives. They provide a structured platform where diverse members collaborate harmoniously, thanks to established boundaries, norms, authority structures, communication networks, and incentive systems. The essence of an organization lies in the process of harmonizing individual or group tasks with the necessary resources. This synchronization ensures tasks are executed efficiently, systematically, constructively, and in a coordinated manner, optimizing the collective effort available (Diksha, 2017). Essentially, organizations serve as platforms that enable individuals with varied skills and expertise to work together effectively towards shared objectives.

The study, which focused on management information systems, sought to determine how these systems had aided in the provision of services in Nigerian universities and the reduction of paperwork at these institutions. A ‘sample size’ of 332 was being taken from the study's population of 1,928, according to Freund and William's formula. Questionnaires were the primary and secondary data gathering tools. 275 employees completed the questionnaire and returned it. The study used the survey methodology. Chi-square (x2) was employed for the test with the help of three hypotheses. With the use of the Statistical Package for Social Sciences, the Z-test and Chi-square (2) statistical tools were used to examine hypotheses 1, 3, and 4. (SPSS). The results showed that management information systems have greatly aided in service delivery, which led to the calculations 2 (Calculated) (95,n =150) = 0.889,p0.5 and 2 (Tabulated) (95,n =150) = 36.042. Management information systems have also significantly aided in the reduction of paperwork. According to the study's findings, a weak management information system is a barrier to Nigeria's universities being successfully managed. As per the report, it is essential for managers at every hierarchical level to undergo comprehensive orientation, and secretaries should receive continuous in-service training. This ensures the appropriate and effective utilization of Management Information System (MIS) facilities, enabling the production and dissemination of information within institutions. This enhanced knowledge and training are crucial for making informed decisions within the organization (Marire Mary Ijeoma, 2018).

2.2 BDA-BIS & ORGANIZATIONAL PERFORMANCE:

Performance serves as a measure of achievements for individuals, groups, or organizations. When it comes to organizations, performance is a continual, action-driven process aimed at improvement. It centres on benchmarks, standards, evaluations, and feedback, reflecting a constant effort to enhance outcomes. This dynamic approach characterizes organizational performance Ababneh (2008).

An organization's performance is determined by evaluating its tangible results and outcomes in comparison to the intended goals and objectives. Organizations employ performance measurement to enhance accountability, provide valuable operational insights, and facilitate more effective planning, budgeting, and evaluation processes (Ammons, 2001).

According to Hunger et al. (2007) performance is the result of an activity, and performance of organization is the culmination of all work processes & activities that make up the organisation. Managers monitor and regulate organisational performance because doing so improves management evaluations, increases the capacity to deliver value to customers, enhances measures of organisational knowledge, and has an effect on an organization's reputation.

When assessing an organization's performance, it involves analysing past management decisions related to investments, operations, and financing. This evaluation aims to determine the efficient utilization of available resources, whether the business's profitability met or exceeded expectations, and if financial decisions were made prudently (Shaukat et al., 2008). Additionally, decisions regarding the continuation, improvement, expansion, or reduction of a program or initiative rely on analyses of organizational performance (Rossi et al., 1999). Traditionally, performance measurement has relied on productivity indicators such as service inputs and outputs (Holmes et al., 2006). In recent years, many companies have explored the adoption of the balanced scorecard system, which assesses performance across various dimensions, to effectively manage organizational performance.

According to Daft (1983), organisational effectiveness is "the extent to which an organisation fulfilled its aims." Organizational effectiveness, according to Mondy (1990), is "the extent to which an organisation provides the expected result."

According to Walrad and Moss (1993) efficiency is defined as the ability to do a task in less time, for less money, or with fewer resources (or employees). Effectiveness refers to how

successfully one does one's duties. To put it another way, the output (final product) is of a high calibre. It is a rare and wonderful occurrence when a problem-solving approach is both successful and efficient; ordinarily, one must choose which he likes because one typically cannot have both.

Several forward-thinking businesses have created tools for making decisions in real time utilising supply and demand side data. They can make decisions in real time online using data, which traditional business models cannot match. Big data is used by transportation service providers like Uber to route cars in real-time, reducing wait times and improving the rider experience (Woodie, 2015). Both customers and cab drivers benefit from real-time information provided by ride-sharing platforms like Ola and Uber through integrated services such as Google Maps.

Many innovative companies have embraced real-time decision-making using data from both supply and demand sides. Through advanced analytics, these companies have established online decision-making systems that traditional businesses can't match. Ride-sharing services like Uber utilize big data to efficiently route cars, reducing wait times and enhancing the customer experience. Both Uber and Ola provide real-time information to both riders and drivers using Google Maps, utilizing a constant flow of data on cab demand and availability in various areas. By analysing this real-time data, they create effective methods to manage demand. Singapore recently introduced Beeline, a shared private transportation concept driven by data analytics and mobile technology. This system dynamically assigns buses based on demand patterns and uses crowd-sourced travel data to identify optimal routes. This approach reduces commuting time, encouraging people to use shared transportation more often. (Askari, 2015).

Historically, transaction processing systems like ERPs[5] facilitated internal company decisions according to Davenport and Dyché (2013). As technology advanced, the integration of supply and demand side systems such as SRM[6] and CRM,[7] linking internal processes with suppliers (like Ariba) and clients (e.g., Siebel), became prevalent. These systems relied on well-structured relational databases, aiding in various operational choices like product pricing strategies, order status inquiries, inventory planning, cost analysis, and managing outstanding payments. The data derived from these systems significantly

[5] Enterprise Resource Planning
[6] Supplier Relationship Management
[7] Customer Relationship Management

improved the accuracy and speed of internal decisions. Additionally, data warehouses and data mining processes utilized this data for further analysis. By employing techniques like data mining, patterns, correlations, and association rules were discovered from accumulated data, enhancing overall business insights, as highlighted by Han et al (2011).

Enterprises may use business analytics as a tool to increase their business performance in terms of customer service, customer retention, and client acquisition. Using the information that is now accessible, predictive analytics enables us to make predictions about potential outcomes. The ability to prepare ahead is a competitive advantage for a business. Data patterns, correlations, and linkages may be used to segment markets, improve sales performance, and find the ideal clients for a product. Every field where data may be gathered can use analytics. Analytics for supply chains are provided in the following areas: demand forecasting, fleet and route size and optimization, inventory optimization, and procurement planning (Nair, 2012).

Kokila et al. (2017) data analytics are a key component of the field of business intelligence (BI), which helps users get corporate insights for better decision-making. Numerous businesses are gathering and keeping a vast amount of data about their existing and future clients, vendors, and business partners. The companies are unable to turn the data into meaningful and helpful knowledge since it is difficult to find the hidden information in the data. Big data analytics technologies may be able to assist these businesses in extracting insights from the vast amounts of data. It assists businesses in gaining knowledge in order to automate decision-making for the achievement of their objectives. Business intelligence solutions provide management and other departments with crucial analytical tools and critical performance indicators. It offers further advantages in terms of data quality, scalability, analytical power, and user-friendly presentation. Big data analytics and business intelligence technologies turn sales and customer data into useful information. To maximise the value of this corporate data, big data strategies work in conjunction with business intelligence technologies. This study offers an analysis of how the big data analytics tool aids in e-commerce business management.

Arefin, Md. (2015) the goal of the study was to determine how organisational strategy, structure, process, and culture affect organisational success and if business intelligence (BI) systems may play a mediating role in this relationship. Design, technique, and strategy 225 organisational units in Bangladesh provided the sample data for this study, which was then

examined using the partial least squares method, a statistical analytic approach based on structural equation modelling. The research indicated that organizational factors like strategy, structure, processes, and culture positively impacted the effectiveness of both Business Intelligence (BI) systems and the overall efficiency of the company. Moreover, the study revealed that the success of BI systems plays a role in mediating how corporate strategy, structure, processes, and culture influence the overall effectiveness of the organization.BI systems can affect corporate success since they are context-specific. The lack of research on the relationship between organisational factors and BI systems inspires this study to make a contribution to the literature on BI systems by putting forth a theoretical model and looking into how BI systems act as a mediator between different organisational factors and organisational effectiveness.

Anshari et al. (2019) focused that in order to successfully use data to attain performance excellence, the organization's culture must be fundamentally changed, and senior management commitment and support are essential. Achieving performance excellence necessitates a strong commitment from senior management towards leveraging data science. This involves implementing process measurement systems, collecting and analyzing data, and granting employees access to a skilled team of data scientists proficient in diverse data science fields. Consequently, it's crucial for leadership to ensure the integration of digital technology within the company's operations, enabling the comprehensive collection of data. The organization's potential to achieve performance excellence greatly hinges on its capacity to effectively employ data science tools for comprehending and analyzing vast datasets. With the aid of data analytics concepts, tools, and methodologies, data scientists can delve into these datasets, extracting valuable information and insights essential for informed decision-making. This strategic use of data science empowers businesses to enhance their performance significantly.

2.3 BDA-BIS AND DECISION MAKING:

Almeida et al. (2023) have made a noteworthy contribution by shedding light on the far-reaching nature of big data that transcends the capacities of conventional data management approaches. In their work, they delve deeply into the fundamental characteristics that define big data, specifically highlighting three critical aspects: volume, velocity, and variety. These characteristics are pivotal in shaping the decision-making processes within organizations. The "volume" aspect signifies the sheer magnitude of data generated and collected, often

exceeding what traditional systems can handle. "Velocity" pertains to the rapid pace at which data accumulates and evolves, demanding real-time processing and analysis. "Variety" underscores the diverse forms and formats that data can take, including structured and unstructured data from various sources. By identifying and emphasizing these core attributes, Almeida and colleagues offer organizations a valuable framework for comprehending the distinctive nature of big data. This framework not only aids in understanding the challenges posed by big data but also facilitates adaptation and the development of strategies to harness its potential effectively. Their contribution enriches the discourse on big data's impact on decision-making and underscores the importance of recognizing these inherent characteristics when navigating the complexities of the data-driven landscape.

Latif et al. (2023) have addressed the existing gap in understanding the influence of big data analytics (BDA) on decision-making and its subsequent consequences for organizational performance. Their study, rooted in the information processing perspective and survey-based evaluations, establishes a connection between BDA and the efficiency of decision-making, with a specific focus on the textile industry. The primary objective of this research is to explore the relationship between BDA and decision-making within organizations and to gauge the degree to which BDA shapes these decisions. The study collected data from 570 respondents through a questionnaire, and the subsequent statistical analysis demonstrates that BDA has a positive impact on an organization's ability to make effective decisions. Importantly, the research also reveals that there are no significant differences between large corporations and medium-sized businesses in terms of how BDA influences successful decision-making. These findings offer valuable insights for managers aiming to improve their decision-making processes through the utilization of BDA.

Salari, Omid. (2022) due to its direct impact on the growth of enterprises and firms, big data has come under more and more consideration by experts and business owners, boosting the effectiveness of crucial business choices. There is a great amount of information that may be utilized and correctly investigated due to the growth in Internet usage and the development of information storage technologies. Big data is the term used to describe the volume of information that may be utilized to guide crucial business growth choices. While this is going on, a lot of startups and even huge businesses are confused how to exploit big data. This article analyses how to effectively extract information to help decision making in addition to looking at big data and its significance in decision making.

Wiederet al. (2015), over the past decade, business intelligence (BI) systems have remained a primary concern for Chief Information Officers (CIOs). However, there is limited understanding regarding the effective maintenance of these systems beyond their initial adoption phase. Addressing this gap, a study conducted by Wieder et al. (2015) explores the direct and indirect impacts of BI management quality on managerial decision-making quality. This research utilizes Partial Least Squares (PLS) analysis of survey data obtained from senior IT managers in Australia. The study's findings not only validate the overall connection between BI management quality and improved managerial decision-making but also shed light on the mediating roles played by data/information quality and the scope of the BI solution. Specifically, the research emphasizes the significance of active management of BI systems and the breadth of solutions employed. This study provides unprecedented evidence concerning the direct and indirect factors that influence enhancements in managerial decision support related to the comprehensive nature of BI solutions. By uncovering these intricate relationships, this research not only contributes valuable insights to the academic sphere but also offers practical implications for industry professionals. Understanding the nuanced impact of BI management quality, data quality, and the extent of BI solutions is crucial for organizations aiming to enhance their managerial decision-making processes effectively.

As indicated by Ram et al. (2016), the global landscape has witnessed a transformative shift in business operations due to the widespread adoption of social media. This shift has necessitated a change in paradigms, leading to the accumulation of vast datasets from various social media platforms. Recognizing the importance of this data, businesses have increasingly turned to big data analytics for business intelligence purposes. Despite its significance, there remains a gap in research concerning the impact of big data analytics on business intelligence, particularly in the context of data gathered from Chinese social media platforms. To bridge this gap, our study focuses on exploring the role and implications of big data analytics in business intelligence using information sourced from Chinese social media platforms. The research employs a qualitative approach to data collection and analysis, given its exploratory nature. We have meticulously designed a comprehensive semi-structured questionnaire based on an in-depth review of existing literature. The study aims to conduct interviews with 35-40 respondents spanning various industries, including retail and manufacturing. The gathered data will be meticulously analyzed using Nvivo software, allowing us to identify crucial issues related to extracting value from Big Data

analytics for business intelligence objectives. The outcomes of this research are anticipated to significantly influence both theoretical frameworks and practical strategies. By shedding light on effective methods for maximizing the potential of social media channels, the study will contribute to the development of informed plans and strategies, thereby enhancing corporate value in the ever-evolving digital landscape.

Tuncay, Erhun & Belgin, Onder (2010) the analysis of data related to business processes involves specific approaches, with "business intelligence" being a prominent subset among these strategies. Business intelligence primarily revolves around gathering and scrutinizing data concerning an organization, its customers, and competitors. These methods facilitate the collection, storage, analysis, and presentation of intelligent insights from corporate data. The goal is to identify crucial trends or patterns that aid decision-making. Consequently, businesses can make more precise decisions on both tactical and strategic management matters, such as optimizing their supply chain or devising competitive strategies for specific markets. Business intelligence applications include query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining, which are frequently employed in decision support systems. These programs are often integrated into enterprise resource planning systems and utilize data sourced from data warehouses or data marts. The study delves into the methods utilized for business intelligence activities within organizations, the underlying logic employed by business intelligence tools during the decision-making process, and their role in enhancing organizational efficiency.

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