THE IMPACT OF BUSINESS INTELLIGENCE ON INNOVATION, RISK MANAGEMENT AND ORGANIZATIONAL CULTURE

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DECLARATION

I therefore want to declare that this project reported title as "The Impact of Business Intelligence on Innovation, Risk Management and Organizational Culture" is a record of original work done by me and I have not copied any of the research work of the researchers. I also want to state that, no plagiarism issues will take place in this research as well.

The information and data given in the report are authentic to the best of my knowledge. This project report is not submitted to any other university or institution for the award of any degree or published any time before.

Abstract

This research has explored the implications of incorporating business intelligence and analytical capabilities on the management of risks, innovation and organisational culture with a particular focus on UK SMEs. The business intelligence software market is rapidly expanding in the contemporary era due to its increasing significance and adoption. Other than that, a diverse range of factors have taken an incredibly significant role in encouraging the adoption of business intelligence technologies in SMEs. The selection of a secondary qualitative method has enabled the demonstration of relevant data based on the research objectives and questions. Besides this, a systematic review has been performed to synthesise and interpret the collected information.The study also tries to foster that how an effective communication helps the employee in roles through improving the performance of employee'smediator.

The mediating communication role helps in build a resources and organisational culture's role for enhancing the performance organising future technology and its social to creates a critical role for communication while fostering a good organisation. Disruptive innovation impacts the agility of organisations in the manufacturing industry importance of information plays a vital role in driving innovation in the organisation has been there for well-defined instruments and clear goals helps facilitate wards the development of the decision-making perspective of the organisation. The approaches of data-driven create a dynamic which helps in enabling the organisations for focusing to the innovative nature with confidence and greater precision. BI helps the organisation through the process of monitoring the critical metrics of the organisation and providing performance indicators. This process helps the SME to understand the problems at an early stage and respond to the problems in a fast.

Key words: Business intelligence, SME, analytical capabilities, organisational culture, innovation, technology

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CHAPTER 1: INTRODUCTION

1.1 Background of the study

The arrival of industrial revolution and globalization has been aggravating with a rapid rate, hence in order to explore different market segments as well as gain effective edge within business a large number of companies has been focusing on making technological up gradation. The steps towards enhancing technological tools and infrastructure within the workplace it mostly help companies to improve operational and strategic performance within the market sphere (Yang *et al.* 2023). It mostly increases the overall trends of the enterprises towards investing on digitalization and technological up gradation process to avail an empirical growth and edge over rivals in the competitive market. Business intelligence is one of the most useful tool that has been used by a large number of leading organizations in recent days worldwide market spectrum as it provide the assistance towards the organization to avail an empirical growth in the competitive periphery.

The basic concept of business intelligence keeps its focus to provide effective supports towards the companies in data analysis and mining process that helps to ensure most suited decisions within business spectrum (SušaVugec*et al.* 2020). The overall strategic decisions taken up by the companies related to product designing, manufacturing, supply chain, marketing and communication as well as HRM gain superior improvement by the supports of the business intelligence. Hence, it offers significant supports towards the enterprises to enhance its performance by gaining attention of a large number of potential consumers by taking more innovative and strategic decisions focusing on consumers aspects. It also helps to improve involvement and satisfaction of each human resources through adopting effective HRM decisions within workplace. Thus, it can be said that the implementation of the business intelligence within strategic and operational practice of a company can provide an out and out success scope in the competitive environment. Thus, this particular research has focused on elaborating the impact of business intelligence on innovation, risk management and organizational culture.

1.2 Rationale

The overall competition and issues within the business spectrum is being increasing with a rapid rate, a large number of MNCs and SMEs has been started business while exploring different market area to ensure strategic growth in the worldwide market. On the other hand, various

environmental, social, political disruptions making it difficult for the business organizations to avail a sustainable and static growth within the business spectrum. It mostly increases attention of the business enterprises to deploy different technological tools and applications within business to ensure an effective growth and edge in the international market sphere. The overall product selection, purchasing behavior of the consumers has also been changing with a rapid rate due to globalization and changing atmosphere of the companies in the competitive market (Gabellini and Scaramuzzi, 2022). Hence, it has become highly essential for the business companies which are operating in the UK to undertake effective strategy to optimiseand upgrade the overall business performance.

The use of different technological tools and appliances within the business mostly helps business companies to gather a large set of consumer oriented data and develop strategy more consumer centric. A consumer centric strategic decision taken up by a company mostly helps to gain superior attention from the global consumers that provide the assistance to enlarge its consumer base and escalate company's growth and position in the market periphery (Gupta and Ramachandran, 2021). It has also increasing the overall investment of the companies towards technological up gradation and digitalization process. A vast range of digital technologies have emerged in the modern era, which is being facilitated by companies. Among these, artificial intelligence has taken a leading role in expanding the technological transformation of business organisations in the UK (Sabanoglu, 2024). Data and analytics is the topmost priority area that has adopted AI, while e-commerce, customer service and stock management are corresponding with the advantages. It signifies the higher intention of the companies to avail supports of different technological tools to expand business globally while availing supports of a large consumer base in the international market. Business intelligence is one of the most effective technological tool that provide key supports towards the company to enhance its growth by taking higher consumer centric decisions in business.
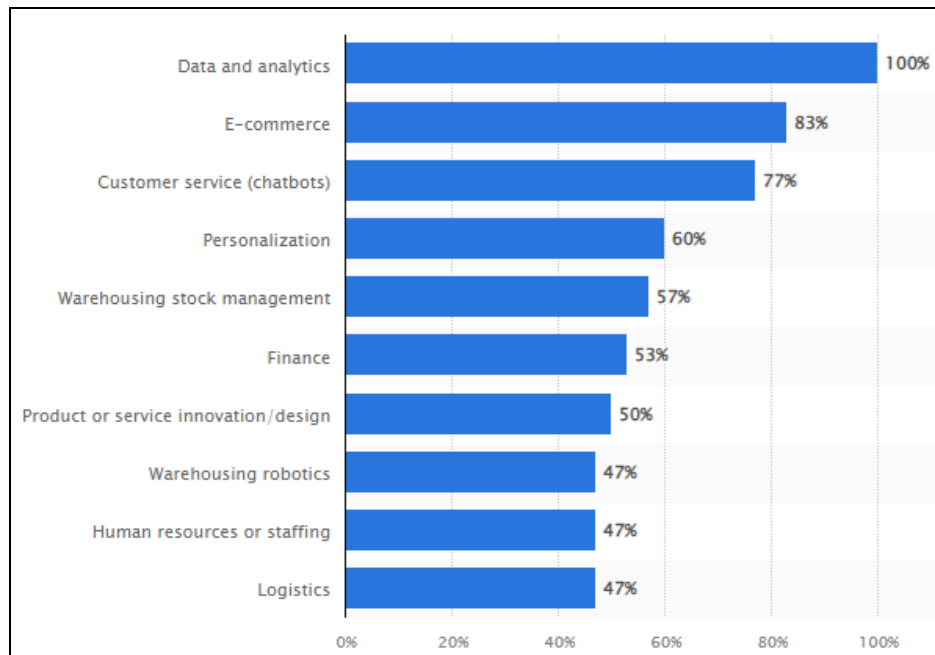
Figure 1.2.1: Top areas in which artificial intelligence is being utilized in the UK

(Source: Sabanoglu, 2024)

The support of business intelligence mostly assist organization to enhance their strategic decision making process in business. The UK has emerged as the leading area for business due to availability of various elements, which include technological support, availability of high-end technological tools and various other supportive aspects. The growing interest on technological incorporation and globalization has not only introduced opportunities but has also reflected complexities, which can be eliminated through facilitating relevant technologies. The overall process of business intelligence involved with improve data mining, analyze, visualization and interpretation process that mostly helps to escalate the ability of the company to take data driven decisions in business (Gottfried *et al.* 2021). The overall interest and intention of the consumers able to be understand through taking a large set of consumer centric data in business and helps to take decisions as per the interest of the consumers. It mostly assists companies' to avail higher support and attention from the customers all around the world and enhance companies' success opportunity in the business spectrum.

It mostly increased the overall tendency of the business companies and managers to avail the support of business intelligence in decision making process in the international market. As of 2024, the revenue of the "business intelligence software market" is being estimated to record revenue of 1.43 billion dollars (Statista, 2023).Besides this, the revenue is also estimated to grow

by a CAGR of 6.79% during the 2024-2028 periods, which can result in a market volume of 1.86 billion dollars by the end of 2028. It showcased the increasing demand of the companies to avail the support of business intelligence in recent days worldwide market spectrum. The demand of the implications of BI in the business periphery has also been increasing with a huge rate in different industry sector in the international market. In the fiscal year of 2018, SAP held's the highest value in business intelligence and holds 8.6 percent market share in BI and analytics tools software market (Vailshery, 2022).
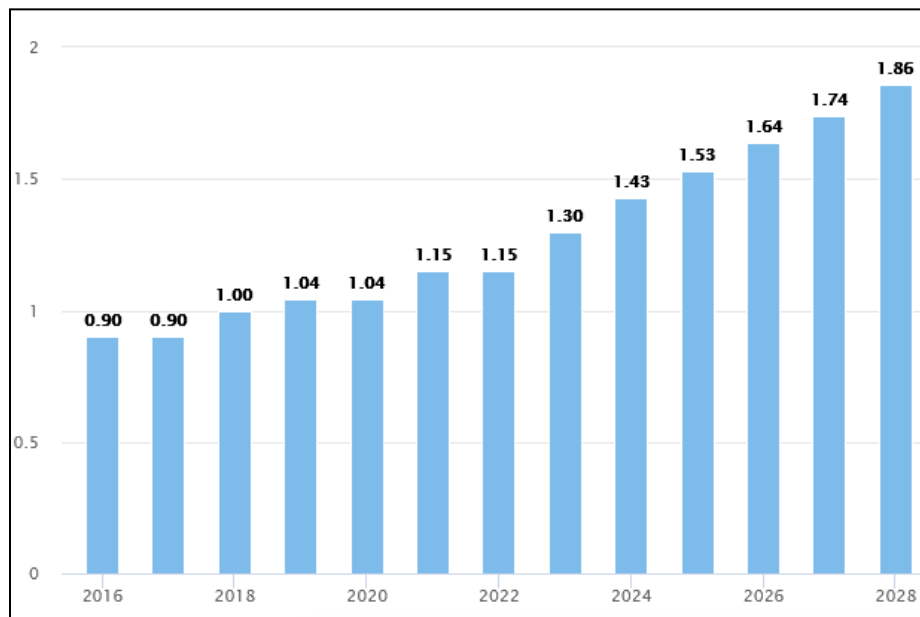
Figure1.2.2: Revenue growth performance of business intelligence software market in the UK

(Source: Statista, 2023)

The technological sector has become more comprehensive and competitive through the incorporation of high-end intelligence and analytical capabilities. Facilitating advanced analytical techniques and tools support leveraging the overall business performance through upgrading the employee performance and organizational culture among UK-based SMEs. Hence, this particular thesis has kept its focus on discuss elaborative about the impact of business intelligence on innovation, risk management and organizational culture. A large number of literature sources and information's related to business intelligence and its overall influence on risk management, organizational culture and implementing innovation and creativity within a company is going to elaborate with a detail manner. It is going to provide a key support to

enhance understanding on the topic and provide support to undertake necessary steps towards implementation of business analytics within an enterprise in the international market.

1.3 Aims and objectives

The basic aims of this particular thesis is to analysis the role of business intelligence to improve risk management, innovation, decision making process and organizational culture within recent days global market. The objective which is going to be focused within this particular thesis is mentioned below.

Objectives

- To explore the contribution of business analytical capabilities on the financial performance of UK-based SMEs
- To explore the relevance of business intelligence on the identification and mitigation of real-world issues in UK-based SMEs
- To investigate the significance of business intelligence in fostering Industry 4.0 innovation and improving employee performance in UK-based SMEs
- To propose strategic approaches for UK-based SMEs to facilitate business intelligence and establishing a strong organizational culture

1.4 Research Questions

- How the business analytical capability does contribute to improve the financial performance of UK based SMEs?
- What role does business intelligence play in identifying and mitigating real-world problems in UK based SMEs?
- How business intelligence can foster innovation in the era of Industry 4.0 and improve employee performance in UK based SMEs?
- How can companies (SMEs) use business intelligence to create a strong organisational culture that helps them hire and retain their best talent?

1.5 Significance of the thesis

In order to undertake steps towards a certain technological improvement, it becomes essential to gain an apex knowledge and understanding about the technological tools within business spectrum. The knowledge about business analytics technologies in business periphery is significantly low in rate that causes critical issues to implement effective steps and practices regarding business intelligence. This, this research has targeted the exploration of the role and

implications of BI technologies on organizational performance, risk management and organizational culture among UK-based SMEs. Thus, the thesis is going to assist to escalate overall learning and awareness regarding business intelligences and analytics software's within strategic and operational practices of an enterprise in the competitive market. It is going to mostly help business companies to escalate its growth opportunity by enhancing company's risk management and organizational culture within the working sector. It aims to assist business companies to implement effective innovation and creativity within workplace by taking more efficient strategic decisions within business.

1.6 Chapter summary

This particular theism has been involved itself to discuss the contribution of BI in improving risk management, organizational culture and implement higher innovation within the working periphery of an enterprise in recent days business environment globally. The background and rationale of the study has discussed with a detailed manner within the chapter. The Aim, objectives and significance of the thesis has also elaborated within the chapter. It is going to help readers to understand the basic purpose and goal of the study effectively.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The literature review chapter of the present research is highly informative as it deals with the ideas that have been shared by past researchers. The literature review section helps a research to avoid the inclusion of similar gaps or information that has already been researched by other researchers. Business Intelligence as shown within the research is a broader concept which provides organisations with several tools that they can use to gather information from the market and about their own performance. The chapter has shown how adopting these technologies in the businesses can help with innovation within the company; the ability of business intelligence to reduce risks and improve the organisational culture has also been explored.

2.2 Integration Process of Business Intelligence on Organizational Innovation

In the modern world, it has been necessary to integrate business intelligence within a company to improve data collection and analysis and make better company decisions. While all organisations can benefit from these innovations, start-ups in particular can benefit from this as it provides them with data-driven insights. The research carried out by Huang *et al.* (2022) stated that the role and contribution of business intelligence cannot be denied as it provides organisations with the ability to monitor the different market trends and the performance of the competitors within the market. Studying the trends can help start-up organisations to learn and make better decisions which can in turn improve their innovation capabilities and improve their financial performance. Business intelligence is therefore an invaluable resource for different organisations because of its ability to make the organisations perform more efficiently. The innovation process requires a successful identification of information, extraction and collection, followed by analysis of the data for successful perforation of operations.

Yang *et al.* (2022) in their study have stated that since start-up organisations are generally based on one particular idea, they are much weaker than the other more dominant organisations within the market. These organisations have to face several political, economic and social problems, without investing in innovation and business intelligence, the organisations will not be able to learn and grow. The effect which business intelligence has on an organisation is based on organisational learning and strong innovation, the research has shown a 95% confidence level in the level of influence and financial efficiency adopting business intelligence can bring to an organisation. The financial performance of an organisation is directly linked to the level of

innovation within an organisation, thus through learning and utilization of the different business applications; the start-up organisations can enhance their performance.

In a broader sense business intelligence refers to the advanced data processing and analysis skills of an organisation to acquire meaningful information. With the rise of global technology, different global trends and data analytics have been introduced that can prevent organisational failures and push the organisation towards success (Ramakrishnan*et al.* 2020). With the help of business intelligence, organisations can sustain themselves through the different technological, cultural and infrastructure changes within the organisation. Startup organisations cannot generally manage large quantities of data, knowledge and intelligence; with business intelligence they can create new ideas and innovations that can utilize the available resources of the organisation more efficiently. Business intelligence also has the potential to increase interaction between different organisations which leads to the generation of new ideas that further drive innovation within the organisation. Nuseir*et al.* (2021) define business intelligence as an umbrella term which incorporates different technologies and activities that help with the collection and analysis of data that helps with improving decision-making. This will stimulate value creation and allow the firms to develop new abilities that increase their ability to perform and address the needs of the consumers more efficiently.

2.3 Role of Business Intelligence in Risk Management

Business intelligence not only helps in driving innovation within the organisation but also helps in the identification of potential risks within the business. Choi *et al.* (2022) have shared that the presence of artificial intelligence in the context of business process management is highly significant as it allows organisations to monitor their production, inventory and other processes within the organisation more efficiently. Information is critical for the growth of an organisation, business intelligence therefore is significant as the improved decision-making allows the organisation to assess the different risks that are involved with the process and take necessary actions. Business intelligence has the potential to support to optimisation of the different calculations and risk assessments within the business to make decisions that are focused towards the organisation (Zamani*et al.* 2021). Each start-up organisation has their own strategy and business model for the selection of projects and prioritizing based on its abilities, however, analyses of historical data provide the organisation with more capabilities to take better risk management protocols and be responsible for the commercial issues that they encounter.

In today's fast moving business world, organisations are faced with risks on an almost daily basis, business intelligence has the capability of providing them with real-time data-driven insights into the market that can help in improving the decisions that they make. The purpose of business intelligence is to support the organisation through its various technologies, applications and practices for the collection and integration of data (Zohuri and Moghaddam, 2020). Business intelligence has the potential of visualising observable data that helps in understanding the different kinds of risks and identifying the patterns within the data for the integration of external sources that can enhance the risk assessment of the company. Business intelligence also helps the organisation by monitoring the critical metrics of the organisation and providing performance indicators that help the company to understand the problems at an early stage and respond to the problems in a fast manner before the risks become more prominent and start harming the business.

Through the analysis of multiple data sources, business intelligence can prevent leaks within the organisation and enhance risk management through data quality management. The research by Shao *et al.* (2022) that the risks which business intelligence addresses be split into two, these include a management system through which internal and 4external problems can be addressed, while the external aspect helps in translating the different guidelines for improving the processes of the organisation. Introducing business intelligence increases the operational efficiency of the organisation, this helps in addressing the gaps and exploring the different opportunities it provides for resource usage. The company can negotiate more effortful and control any form of risk within the organisation. The consistency of the frameworks helps boost the efficacy of the organisation in reaching out to consumers and acquiring knowledge for addressing the different forms of issues that they might encounter. Cheng *et al.* (2020) suggest that since business information provides the company with ownership, they can have proper control over the resources which can significantly reduce any form of risks that exist within the internationalisation of the risks.

2.4 Factors that Drive Business Intelligence Culture

The organisational culture generally refers to the values, beliefs and practices that are shared across the space for managing the information within the company. Organisations that possess information cultures have a smooth flow of information and availability; this helps in enhancing the decision-making skills of the e, employees and makes them more adaptable in utilising the

outcomes of business intelligence to cultivate strong results (Hmoud*et al.* 2023). Past studies have already shared how business intelligence can help in enhancing the decision-making of the organisation, the ability to process large amounts of data is highly helpful for the organisation as it enables them to forecast and monitor the different outcomes of the organisation and create a supportive work environment where the employees can share their experiences, and others can be influenced by them through the process of discovering new knowledge. The start-up IT companies as shown within the research often struggle to create a sustainable work culture; this practice makes them carry out data-driven decisions. Organisations that make use of business intelligence can increase the level of education of the employees and improve their performance. Choi *et al.* (2022) in research work have successfully highlighted how organisations in the modern era expect their employees to make decisions that are given by data and can provide the organisation with a competitive edge within the market. Classical business intelligence can be seen to not meet the requirements all the time and as a result, employees are not able to meet the requirements, adopting business intelligence to the organisation has the potential to reduce the workload of the employees which in turn allows them with a better environment where they can learn their full potential, a supportive work environment is highly important. Hung and Chen (2020) have further elaborated on this idea as they have shared the effect organisational support has on improving the business intelligence of the organisation and the adoptive behaviour and information culture.

Studies have shown that business intelligence tends to have a positive impact on start-ups as it allows them to manage their knowledge more efficiently. The updated information of business intelligence provides to organisations helps in explaining different concepts and making dynamic changes to the organisation that can provide a competitive advantage to the organisations in the market. With a supportive workplace and culture, new opportunities can arise through the transfer of knowledge between the employees and the increase of productivity in the organisation. Through business intelligence and a supportive workforce, the organisation might be able to improve its performance and productivity which in turn leads to better decision-making for the organisation (Nazari*et al.* 2022). The use of business intelligence contributes to the promotion of creativity and invention within the organisation strengthens the culture and creates high economic value for the organisation. Providing attention to knowledge also

increases the emphasis on the acquisition and use of business intelligence tools within the organisation.

2.5 Impact of Business Intelligence, learning and Innovation on the Organizational Culture

Business intelligence has brought in a technological evolution which offers organisations data-enriched information that allows them organisation to make decisions that are based on evidence. Duan*et al.* (2020) have described how generating business intelligence is important for creating a strong culture within the organisation that also helps with driving innovation in the organisation. The innovation capabilities of an organisation are dependent on the relationship that is shared between the start-up IT organisation and the firms, innovation helps with enhancing knowledge and provides a competitive advantage. The importance of information to drive innovation in the organisation has been the subject of focus for the researcher as it is seen to contribute towards the development of the decision-making perspective of the organisation. When an organisation adopts business intelligence into their work process, they can create a data-driven culture, which contributes to innovation through meaningful and actionable information.

Chatterjee*et al.* (2021) have shared that firms can improve their performance with the use of agility and business intelligence. The organisational culture benefits from these practices as through the expansion of data-driven culture, the firm performance is increased, and the control variables that business intelligence provides help with providing competitive advantage. It should also be mentioned that the business scenario is constantly changing the demands of consumers are changing at a rapid pace. The information that the adoption of business intelligence technologies provides can improve communication and affect the consumer. The inputs that are received through these processes lead to the improvement of the digitalization process of the organisation. Organisations also need to possess the ability to scan the surrounding ecosystems and gain a competitive advantage. Without the support of the managerial team of the organisation, the company is not able to meet the firm's innovation and productivity aspects, therefore organisational culture needs to be consistent.

The research by Stjepić et al (2021) has elaborated on the different barriers which business intelligence faces in being adopted by organisations, issues often arise with the perceived benefits, accessibility and technology usage of the people. However, the study has also researched the potential risks that are involved with the procedure, inadequate management of data can lead to several; problems within the organisation and lead to the technological

advancements of the organisations being ineffective. The positive impact of business intelligence on reducing the level of risks on the firms has been discovered by several research works, it has also shown that superior relationship with the employees also prevents these problems from occurring. With improved relationships, the organisation can help build trust and communication and lead to improvement and profitability (Yiu*et al.* 2021). Instrituitonailsim of the business innovation leads to stable work environments reduces the volatility of the profits and streamlines the information collection and facilitating process of the company.

2.6 Theoretical Underpinning

2.6.1 Diffusion of Innovation

In order to understand the impact which business innovation has, the research will be utilizing the diffusion of innovation theory. The theory is built on the principle idea that technology spreads through society and culture, therefore the patterns and ideas for the spread are explored with the help of this theory. As the study is going to be dealing with the beneficial aspects of business intelligence for start-up organisations, this theory can be used to encourage people to adopt this emerging technology in their businesses to improve overall performance. The theory elaborates that the spread of innovation is accelerated when the organisation possess the right idea about integration and is open to the idea of embracing technology (Goh and Sigala, 2020). As business intelligence is a set of tools and ideas that provide an organisation with a competitive edge, this theory can be used for better operational decisions and strategic plans.

2.6.2 Technology Acceptance Model

Another theory that can help in understanding the concept of business intelligence is the Technology Acceptance Model (TAM), the main idea of the theory is that people adopt new technology based on its perceived usefulness and ease of use. As the study deals with the understanding of business intelligence on innovation, risk management and the culture of the organisation, TAM can be useful in recognizing the factors that affect the acceptance rate of the people. Researchers generally prefer TAM over the other models for its robust and parsimonious ability to predict the factors which contribute towards people adopting certain technologies and their acceptance (Alfadda and Mahdi, 2021). The theory has been founded on the idea of reasoned action; the theory can help in understanding the relationship which exists between business intelligence and the different variables of organisational performance.

2.7 Chapter summary

As concluding remarks, the study has shown the potential that business intelligence has for start-ups within the IT sector, and the idea of innovation has been presented within the research. The business intelligence tools present information in a user-friendly manner to help visualise the analysed data to develop insight and improve the decisions making process of the organisation, which in turn contributes towards better risk management in the organisation. The positive impact which business intelligence has towards organisational culture has also closely been studied within the research. Lastly, the study has incorporated the Diffusion of Innovation and Technology Acceptance Model theories to show the benefits of business intelligence in modern-day organisations.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter has shed light on the incredibly relevant techniques and methods that can be accessed for gaining critical answers to the research questions. The selection of a secondary qualitative method for the data collection and analysis has been justified in this chapter through the selection and evaluation of associated techniques and procedures. Moreover, this chapter contains of the identification of the most relevant and suitable methods for this research.

3.2 Research Philosophy

The research philosophy involves guiding the entire study based on philosophical assumptions as this method directly corresponds with the source and nature of knowledge relating to any phenomenon. This method includes different types based on the distinction in characteristics, such as pragmatism, interpretivism, realism and positivism. As mentioned by Alharahsheh and Pius (2020), the interpretivism philosophy maintains an indulgence with the in-depth variables relating to a social phenomenon. On the contrary, the positivism philosophy mostly supports the collection of factual data, while the premises and research methods should be incredibly realistic for the realism philosophy. Henceforth, the application of an *interpretivism research philosophy* has been identified to be supportive of the exploration of the role of business analytics on financial and employee performance among UK-based SMEs.

3.3 Research Approach

The purpose of the research approach within a specific research is to provide a general idea or plan for the research and determine the data collection methods that is going be taken into consideration for conducting the research. This method is divided into three different categories as per their characteristics and relevance, which include inductive, deductive and abductive. In addition to that, the inductive approach is also known as inductive reasoning and supports the collection of secondary data to meet the research aim and objectives. Among these methods, the *inductive approach* involves the formulation of a new theory based on the gathered data (Al-Ababneh, 2020). It is important to understand the need for prioritising different approaches and methods in research as these support meeting the main purpose and objectives. It is expected that utilising an inductive research approach allows the exploration and collection of incredibly reliable and relevant data relating to the use of business intelligence analytics and its relevance to organisational culture.

3.4 Research Design

This specific research method can be referred to as a research framework as it contains the selected methods and techniques along with synthesising them properly to guide the data collection procedure as per the research questions. The fundamental parts of research design include descriptive, exploratory, explanatory and correlational. As revealed by Turale (2020), the application of qualitative methods supports the promotion and incredible performance of research designs. Facilitating an *explanatory research design* can support exploring the social phenomenon along with formulating answers to the research questions. This method is expected to derive answers to the research questions by demonstrating the phenomenon and providing insights relating to the usage and effect of business intelligence on the overall organisational performance, risk management and innovation.

3.5 Data Collection Method

The process of data collection is considered to be among the most critical and comprehensive procedures in scientific research. Moreover, this procedure can be carried out with the application of either a primary or a secondary method, which deals with utilising different methods and tools for gathering information. Nonetheless, the primary method utilises surveys or interviews, while previously published data is accessed through a secondary method. A diverse range of sources are available from which secondary data can be gathered for scientific research purposes (Areco *et al.* 2021). Based on the nature and other aspects, data can be further divided into qualitative and quantitative, reflecting the need for selecting specific types of methods for the collection of incredibly relevant data associated with the research phenomenon. On the contrary, qualitative methods of data collection believe in taking into consideration people's words, sounds and feelings and therefore do not involve mathematical calculations of any kind. It is important to understand that to explore the research phenomenon by considering the research purposes, suitable methods have to be selected.

Unlike quantitative methods, this form of data collection and analysis provides a greater depth of the different concepts, interviews are the chosen method of data collection for this process and utilise questions that are open-ended thereby allowing the participants to express themselves. Mixed methods are only applied when the research questions that are chosen require both numerical and textual data. The *secondary method* is relatively cost-effective and proficient compared to the latter, due to which, this method is selected to follow in the data collection

process. Indeed, accessing recent data through exploring journals and articles that are published in or after 2020 may support developing critical insights based on the latest information relating to the role of business intelligence analytics on the overall organisational performance and culture in the SMEs within the UK. The application of a secondary methodological approach for the data collection and analysis procedures supports meeting the core purpose of the research (Van den Akker*et al.* 2021). Besides this, a secondary method is being chosen for the collection of qualitative data relating to the impact of business intelligence and analytical capabilities on the organisational performance of SMEs operating in the UK.

3.6 Data Analysis Process

The most comprehensive process in scientific research is the data analysis procedure as it maintains indulgence with a vast range of activities, which include data processing, structuring, interpreting and assessing. Besides this, the process of selecting and facilitating an incredibly suitable and relevant method for analysing data relies on the nature of the data required for the research along with the method chosen for data collection. It is important to understand the correlation between the method selected for data collection and analysis as it directly influences the research outcomes. Carrying out a qualitative analysis can be incredibly comprehensive and challenging oftentimes (Lester *et al.* 2020). Due to having chosen a secondary qualitative method for gathering relevant information relating to the research area, a similar methodological approach has to be selected for carrying out the data analysis process. A diverse range of methods and techniques are available for the analysis of secondary qualitative data, which include meta-analysis, thematic analysis and systematic review.

The *systematic review* is a structured method that involves analysing empirical evidence and structures the gathered data based on different aspects, which include the methodological approaches, research purposes and findings. Conducting this specific method can support the exploration of the implications of business intelligence on organisational culture, employee performance and risk management approaches. Indeed, this data analysis method can create an opportune time for the demonstration of the usage and effect of different business intelligence technologies and tools on the organisational culture. Besides this, a systematic review is incredibly scientific and informative for data analysis procedures (Paul *et al.* 2021.). A wide range of literary pieces is going to be accessed for the process, which is decided to be incredibly

significant and essential for the formulation of crucial insights relating to the role of business intelligence towards organisational culture, risk management and innovation performance.

3.7 Ethical Considerations

Prioritising research ethics has turned out to be quite comprehensive and incredibly required in the scientific research process. Leveraging potential ethical considerations supports the maintenance of the human rights of the participants and scientific integration (Suri, 2020). Facilitating a secondary methodological approach supports avoiding the formulation of critical ethical complications. Only publicly accessible journals and articles with proper citations have been accessed and the used sources have been credited in the bibliography section to avoid plagiarism. Besides this, no confidential information has been collected and no natural elements have been affected during these procedures. Other than that, all potential research ethics has been followed, which include taking into consideration the copyright acts and avoiding using irrelevant sources and unpublished or manipulated data.

3.8 Research Limitations

The main limitations encountered during the research procedures include a critical shortage of time and budget. Indeed, the presence of a time shortage alongside budget restrictions created constraints in utilising a primary method for data collection through surveys or interviews. As this study do not conation of secondary research, this research might lack of having new insights. Besides this, large data sets have also not been accessed due to the lack of budget and time availability and inability of access resulting in the application of a systematic review.

3.9 Chapter summary

In conclusion, the methodology chapter holds an incredible role in determining the procedures and techniques that has been utilised in the research process. Based on the main purpose of this study, an incredible corresponding support of qualitative methods has been observed, resulting in the selection of secondary qualitative methods. Facilitating an interpretivism philosophy is expected to support the collection of secondary data sets, while an inductive approach provides beneficial advantages for meeting the research objectives. The findings will then be analysed against the findings that have been acquired from past research works by conducting a systematic review to present a cohesive research where all of the different aspects has been considered.

CHAPTER 4: RESULTS

4.1 Introduction

Business intelligence profoundly impacts organisational culture, innovation, and risk management. This chapter highlights the transformative nature of business intelligence and its effect on the process of risk semester. This discussion involves a systematic review and explores the theoretical contribution of business intelligence under the managerial recommendation and domain, which potentially affects the culture of the business and empowers its future roles. The organisation also continues to navigate the landscape of the business, which uses the strategic play of business intelligence to help the whole differentiator achieve a well-sustainable success. In business, the effect of intelligence increases the operational efficiency of the organisation, and this helps address the gaps and explore the different opportunities it provides for resource usage.

4.2 Systematic Review

Sl. No.	Author and source	Objective	Methodology	Key findings
1.	Liu, (2020), "Cloud-based Big Data Analytics for Customer Insight-driven Design Innovation in SMEs"	This research has targeted the demonstration of the role of cloud-based platforms in fostering innovation in SMEs.	Employing a primary method for gathering information is proven to be beneficial for gaining incredible insights from a diverse range of manufacturing SMEs based in the UK.	Facilitating a cloud-based technique can play an incredible role in leveraging large customer data sets intending to improve consumer insights.

2.	Duan*et al.* (2020), "Understanding the Impact of Business Analytics on Innovation"	The main purpose of this research is to investigate the role of business analytics in enhancing organisational innovation.	A survey has been carried out among 218 businesses based in the UK.	The incorporation of business analytics supports leveraging environmental scanning, resulting in improved innovation within an organisation. The modern business culture has turned out to be thoroughly data-driven, which directly involves the meaningfulness of new products.
3.	Nasiri*et al.* (2020), "Digital-related capabilities and financial performance: the mediating effect of performance measurement systems"	The key focus has been placed on the exploration and demonstration of the relevance of "performance measurement systems" towards mediating between digital capabilities and the financial performance of SMEs.	A structured survey questionnaire has been facilitated for gathering primary data.	Despite having an incredible effect, "performance measurement systems" do not influence the innovation capabilities of SMEs.

4.	Shetty and Panda, (2021), "An overview of cloud computing in SMEs"	This article has targeted the demonstration of the incorporation of cloud computing technologies in SMEs.	The application of a secondary method has allowed accessing large data sets.	A vast range of factors have influenced the management of cloud computing, which include flexibility and cost. Leveraging cloud computing techniques provides an incredible advantage of accessing augmented adoption and diffusion.

| 5. | Maroufkhani *et al.* (2023), "Determinants of big data analytics adoption in small and medium-sized enterprises (SMEs)" | This research has targeted the identification of the main determinants encouraging the adoption of big data analytics in SMEs. | A total of 171 SMES have been studied for the data-gathering process. | The results have shed light on the "technological, organisational and environmental" or TOE factors and reflected the interconnection between these factors. Leveraging support from top management of SMEs is identified to be incredibly supportive and critical for the enhancement of the performance of big data analytics technologies. |

6.	Carson *et al.* (2020), "The crucial role of market intelligence in the development of small business marketing capabilities"	The main purpose of this article is to discuss the role of market intelligence on the marketing capabilities of small businesses.	A conceptual framework has been presented to explore the research area.	Facilitating market intelligence has turned out to be crucial for the development and management of marketing capabilities in small-sized businesses. Besides this, acknowledging the benefits and relevance of market intelligence has become imperative for these organisations, reflecting the need for increased focus on this specific area.

7.	Ibeh *et al.* (2024), "Business analytics and decision science: A review of techniques in strategic business decision making"	The main intention of this article is to discuss the diversification and relevance of available techniques relating to decision science and business analytics, which are utilised in the strategic decision-making of business organisations.	The usage of available data has supported the demonstration of the role and capability of analytical techniques used in strategic decision-making.	Prioritising the decision-making process in business has become imperative in the modern era, due to which, the need for incorporating business analytics has also increased to a great extent. A diverse range of analytical techniques have been addressed, which include prescriptive analytics, descriptive analytics, machine learning and artificial intelligence.

8.	El-Haddadeh*et al.* (2021), "Value creation for realising the sustainable development goals: Fostering organisational adoption of big data analytics"	This study has been aimed to evaluate the role of incorporating big data analytics in companies to support innovation and sustainability.	A survey has been carried out among 320 managers of organisations based in the UK.	The results have highlighted the priority of top management support for accepting technological transformation within organisations through the integration of big data analytics technology. Accessing support and encouragement from top management is found to be incredibly helpful and supportive along with beneficial for ensuring positive governance of the overall procedures.

| 9. | Masood and Sonntag (2020), "Industry 4.0: Adoption challenges and benefits for SMEs" | The key aim of this research is to explore the challenges and benefits relating to the adoption process of Industry 4.0 technologies in UK-based SMEs. | A survey has been conducted among UK SMEs. | A diverse range of benefits and challenges have been addressed relating to the adoption of Industry 4.0 technologies in UK-based SMEs, while the benefits include cost, flexibility, quality, efficiency and competitive advantage. On the contrary, the lack of knowledge in critical areas along with financial restrictions is the key constraints affecting the efficiency of the adoption process. By taking this into consideration, related challenges can be eliminated. |

| 10. | Chonsawat and Sopadang, (2020), "Defining SMEs' 4.0 readiness indicator" | This article has targeted providing a profound definition of readiness indicators involving the incorporation of Industry 4.0 technologies within SMEs. | A research framework has been for ensuring proper synthesis of the procedures. | The results corresponds with the application of a diverse range of intelligence techniques in business procedures and activities, including cloud manufacturing, business model, industrial internet, digital transformation and collaborative robot. Besides this, these technologies have been categorised into diverse groups, which include digital technology, infrastructure system, data transformation, organisational resilience and manufacturing system. |

| 11. | Mendy, (2021), "Performance management problem of four small and medium-sized enterprises (SMEs): towards a performance resolution" | The key focus has been placed on the identification of potential issues resulting in underperformance of employees in UK-based SMEs. | A theoretical frame has been employed in this research. | Facilitating incredibly efficient learning initiatives and approaches can be supportive in enabling managers to improve employee performance. Besides this, leveraging performance management measures along with providing redefinition of the job roles and responsibilities to employees can provide incredible help. |

| 12. | Roblek *et al.* (2021), "The role and meaning of the digital transformation as a disruptive innovation on small and medium manufacturing enterprises." | To identify the different forms of disruptive innovations and understand their future impact on organisational agility. | The Delphi method is used in this study to forecast future technology and development concerns while designing their impact on business, economics, and society. | The study's findings state that it is important to set a clear and focused goal regarding companies' achievement of disruptive innovation. It is also important to apply well-presented instruments that help enable changes in organisational improvement and provide additional concepts. |

| 13. | Ibrahim *et al.* (2022), "Organizational culture, employee motivation, and workload and employee performance: A mediating role of communication." | To investigate the role of employee communication and the relationship between employee motivation, organisational culture, workload and employee performance. | The quantitative primary method is used here for data collection, and the hypothesis is also generated to access a clear and focused investigation. | The study's finding is that the proper implementation of communication helps enhance employees' performance and always tries to act as a mediator between employee performance and workload. This study highlights the importance of all these materials by mentioning government policies and the development process of human resources. |

Table 1: Systematic review

(Source: Self-developed)

4.3 Discussion

The systematic review summarises different studies concentrating on the role of digital transformation, cloud computing, business intelligence and big data analytics in medium-sized and small enterprises. These studies evaluate various impacts of several technologies on the organisational culture, innovation, and risk management of SMEs.According to Liu (2020), cloud-based big data analytics significantly help foster innovative SME designs.The study showcases the main dynamic that helps in the platform of cloud computing while enabling the SMEs to leverage lagging the largest data sets of customers effectively, deep consumersof insights while taking initiatives to drive innovation. The primary method for gathering information, this approach helps SMEs remain responsible and take care of market demands while fostering innovative strategies. The deployment of BI fosters a culture of transparency and accountability within organisations. The innovative dynamic is very reliable in the newly developing market demands and creates a support system market.
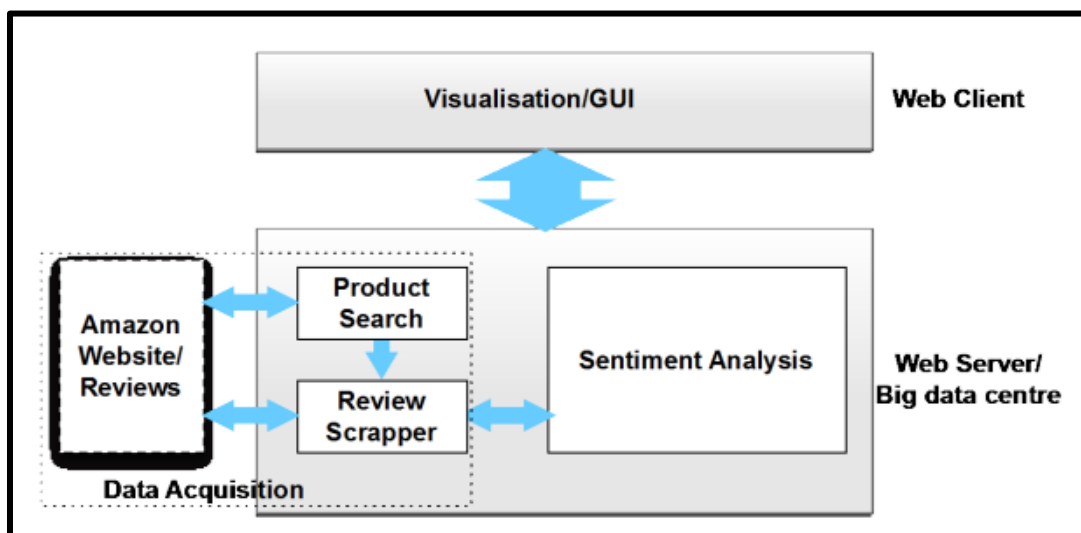
Figure 4.3.1 System overview of big data analysis and customer analysis of SME

(Source: Liu, 2020)

The tools for business analytics facilitatethe identification of customer preferences and market trends while enabling organisations to new products into the markets. Duan*et al.* (2020) investigates the impact of business analytics on organisational innovation. The transformation of a data-driven culturehelpsthe whole decisions in getting an informed under a mannerism of robust data analysis, while supporting the innovation process. Under the performance measurement system, the mediating role helps in enabling the financial OpenOffice and digital

capabilities in SMEs while affecting the dynamic the financial model (Nasiri*et al.* 2020). The implementation of business intelligence within the strategic and operational practices of a company can provide an out-and-out success scope in the competitive environment. SMEs focus on the measurement of integrating performance with some strategic initiatives which promote innovation. While communication also helps to enhance employees' performance and always tries to act as a mediator between employee performance and workload.

As per Shetty and Panda (2021), theprocess of cloud computing in different SMEs shed light on cost benefit and flexibility through cloud technologies. The secondary data exhibitfacilitates cloud computing technology diffusion and augmented adoption, which is critical for maintaining a vast competitive advantage. Reinforcement of the ideas under the cloud platforms are helps to driven the criteria of innovative operational efficiency and data accessibility. Identifyingbig data analytics key determinants under SMEsadoption, focuseson the factor like organisational, environmental, and technological(Maroufkhani*et al.* 2023). The support of top management is critical evaluating aperformance enhancement and implementation of technologies of big data analytics. This finding focuses to evaluate the strategic vision and strong leadership need in the process of adopting tools for advanced analytics, which are importantand focuses towards the driving innovation nature and help in enhance the business performance.The BI can negotiate and control any form of risk within the SME.

Market intelligence is importantof in understanding customer needs and market trends, which are crucial for effective marketing strategies. Carson *et al*. (2020) discusses market intelligence role in developing dynamic of marketing capabilities in small businesses. The SMEs focuses to prioritise the market intelligence for enhance the whole marketing capabilities or always stay ahead in a competitive market. Ibeh*et al.* (2024) also reviewsdifferent kinds of techniques in business analytics and decision science, which helps in enhancing relevant strategic of decision-making. There is aimportance of, descriptive analytics, prescriptive analytics, artificial intelligence and machine learningin new market of business practices. In the process ofincorporating these techniques, the organisations also focus to make a more informed and strategic decisions, which take care of improving the overall innovation potential and it market value.Organisations make use of business intelligence which helps in increase the level of education of the employees and improve their performance.

BI systems empower the landscape of the organisations' throughproviding a deep insights and foster innovation from a large volume of datasets. The tools of BI helps in identify the market gaps, emerging trends, and customer preferences through an advanced modelling of precative, analytics, and pattern recognition. As per El-Haddadeh*et al.* (2021), big data analytics role is helps to fostering sustainability and innovation.The big data analytics significantly contributedtoward asustainable development goalthrough enabling a more efficient utilisation of resource and create an innovative solution. The benefit and challenges of adopting technologies of Industry 4.0 based on SMEs (Masood and Sonntag, 2020). Their survey also reveals that these technologies help offer numerous benefits, which also involve competitive advantage, quality improvement, cost savings, and flexibility; they face present challenges such as financial constraints and knowledge gaps. The study also suggests that these challenges addresses initiatives which help in enhance the effectiveness and adoption of new technologies of Industry 4.0.
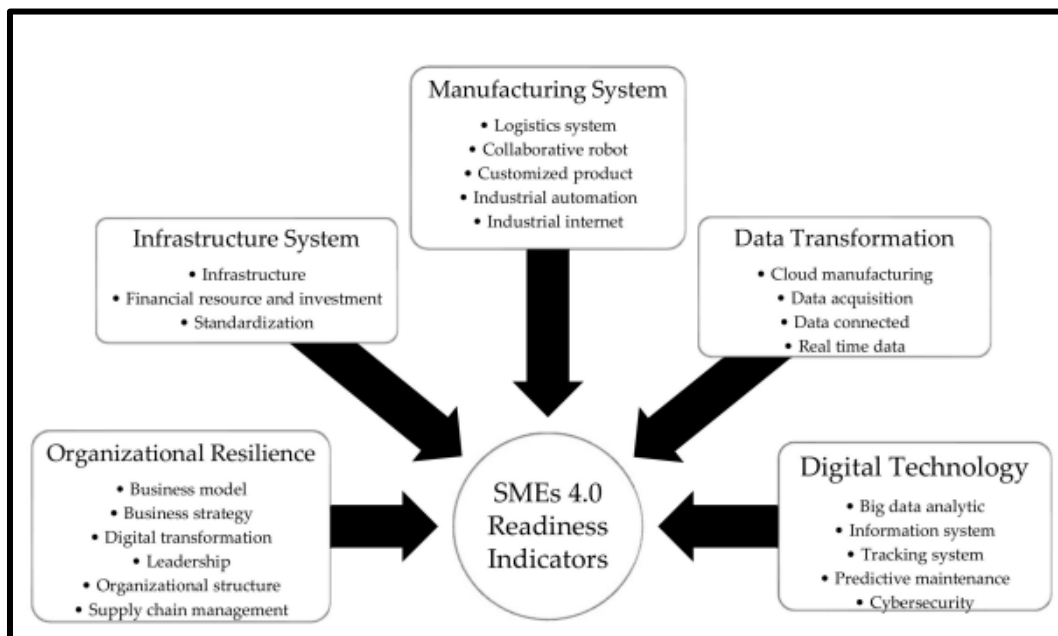
Figure 4.3.2 SME readiness indicator

(Source: Chonsawat and Sopadang, 2020)

The BI integration with collaborative platforms helps and support an innovative culture by breaking depots of organisations. These BI tools supply a centralised access of information within the all departments, which helps in fostering a collaboration of cross-functional collaboration and creates an innovative thinking. Chonsawat and Sopadang (2020) define the

indicators of readiness under the incorporation of SMEs 4.0 Industry technologies. The framework of research evaluates the key areas like infrastructure systems, digital technology, data transformation, manufacturing systems, and organisational resilience. These indicators supply an assessment of preparedness of SMEs for transformation of digital, while highlighting the strategic investment and planning importance of technologies. Identifies different issues which are related to employeesunderperformance ofSMEsand suggestsolutionswhich help them in themeasures of performance management (Mendy, 2021). The study shed light on the importance of efficient initiatives of learning, performance management and redefinition of job role through improving the performance of employee. The finding underscores practices ofhuman resource and organisational culture rolefor enhance the performance of overall business.

The study forecasts a trend of future technology and itssociety and business implications. The disruptive innovation also impacted on the organisation agility in manufacturing industry whether it is small or medium (Roblek*et al.* 2021). The need of well-defined instruments and clear goals helps in facilitate the organisational innovation and improvement. This type of approachis mainly aligningunder a broad range of trend through digital transformation and their significant role which helps in driving business competitiveness and agility. These strategies of SMEs help to leverage the BI technologies for achieve competitive advantage and sustainable growth into the business environment which are increasingly data-driven.

4.4 Chapter summary

The new intelligence has the ability to provide the business with deep insights, foster a data-driven mindset, enable real-time monitoring processes, and renew the concept of transformation in operating organisations. The dynamic of business intelligence is fully covered in the systematic review, which helps the study to gain knowledge about the different perspectives of the new innovation and its effect on the business practices. The discussion also tries to shed light on the managerial recommendations and the theoretical structure that help leverage the new and innovative formulation in the organisation, enabling the capability to cultivate accountability and foster the vulture. Different high-position people play an important role in this part, and through investing in data literacy and advanced analytics, they encourage a decision-making data-centric approach.

CHAPTER 5: CONCLUSION

5.1 Conclusion

Business intelligence procedural and technical infrastructure helps to explore reports and data, which helps the manager of the SME, initiate different business decisions. The concept of BI consists of processes, activities, and technologies for surfacing, collecting, storing, and analyzing information and improving the decision-making process. Digital technologies generate a large amount of data, which is used by the BI to access a company's well-designed management network. This study highlights how a UK-based SME company evaluates the BI concept and how these technologies help it achieve flawless and faster business decisions. The BI also helps them in the forecasting process, mitigating risk, creating organisational culture, and formulating a business strategy. Under the insight, if the data drove the BI, innovation could be fostered through identifying new market opportunities, which would also help enhance the product development process and promote a culture of creativity and improvement.

Emergence of fourth industrial revolution technologies, like advanced robotics, the Internet of Things, additive manufacturing, artificial intelligence and other advanced communication technologies for information, help SMEs and enterprises collect massive amounts of data while fostering a supply chain in the different areas of sustainability. The business intelligence software market is witnessing significant growth in the contemporary era. This expansion is driven by the increasing recognition and adoption of business intelligence tools. These tools have found widespread use in leading organisations across the global market, offering empirical growth opportunities in the competitive landscape. Different proactive approaches also enlightened the study, which helped reduce uncertainties, maintain compliance with regulatory standards, and safeguard financial loss. BI helps to influence the organisational culture by promoting the mind-set under a data-driven system. This study concluded that adopting a culture that values data and encourages agility and learning helps the organisation to adapt to better and evolving opportunities and challenges.

5.2 Linking with Objectives

The finding of the first objective is that the priority of top management support for accepting technological transformation within organisations through the integration of big data analytics technology. Accessing support and encouragement from top management is found to be incredibly helpful and supportive along with beneficial for ensuring positive governance of the

overall financial stability. The finding of the second objective is that facilitating efficient learning initiatives and approaches can be supportive in enabling managers to improve employee performance and mitigate real-world issues. Besides this, leveraging terms of performance management measures along with providing redefinition of the job roles and responsibilities to employees can provide incredible help for issues faced by the SME related to the BI.

The finding of the third objective is the application of a diverse range of BI techniques in business procedures and activities, including cloud manufacturing, digital transformation and collaborative robots. These technologies have been categorised into diverse groups, which include digital technology, infrastructure systems, data transformation, and manufacturing systems. The finding of the fourth objective is that the implementation of communication helps enhance employees' performance, develop cultural performance and always tries to act as a mediator between employee performance and workload. Communication helps in establishing values, beliefs and practices, and theses them help to develop an emerging organisational culture.

5.3 Future Scope

The current research relies on the impact of business intelligence on innovation, risk management and organisational culture. The research focus could be narrowed down further in future research studies because of the variations in the level of access towards financial, technological resources and business intelligence in SMEs. This research might guide researchers about the topic related to business intelligence in different organisations and SMEs, and there are different factors for conducting different research. The research has been done through a systematic review, which will provide future researchers with current information about the selected topic and will be helpful for future researchers to further their work as this study analyses previous studies and journals.

5.4 Recommendations

The organisation should adopt spoke integrated and strategic approach for taking leverage of business intelligence. *Investing in robust technologies and tools* that align with the particular business goal should help in providing data analytics, predictive capabilities and real-time reporting dynamics. This approach helps in maintaining the impact of BI on innovation and risk management. *Promoting a data-driven culture* by fostering data literacy in the organisation should help the organisation by offering resources and training for creating an understanding among the employees about the organisation process of BI tools. These transparency

technologies and data sharing help enhance the process of decision-making and collaboration and create a positive impact on the organisation (Khare*et al.* 2023). ***Prioritising governance and data quality*** through the implementation of different management practices might help the organisation to create security, consistency, and accuracy in data. This implantation helps to build trust generate insight and cultivate an organisational culture into the uses and benefits of the BI initiatives.

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