

University of Wales Trinity Saint David

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RESEARCH PROPOSAL

**INVESTIGATING THE ROLE OF BIG DATA ANALYTICS IN
ENHANCING PRIVACY AND SECURITY IN THE UK
BANKING SECTOR**

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Introduction

The purpose of this research proposal is to evaluate the role of big data analytics in improving the privacy and security of the UK banking sector. Big data analytics uses advanced system structure utilisation approaches to process, transform, store and capture organisational data sets (Hasan *et al.* 2020). Security and privacy are the major concerns for the banking sector in the UK. Reports interpret that the banking sector of the UK has faced a loss of around 21 billion British pounds in the fiscal year 2023-2024 and around 50 percent of banking companies have encountered cyber breaches in the UK (Petrosyan, 2024). The lack of data management strategies and lack of digital infrastructure in the UK banking sector has significantly contributed to the rise in data breaches and cyber-attacks. This study will evaluate the role and effectiveness of big data analytics in improving privacy and security management strategies for the UK banking sector. It has been considered that the research study will test the hypothesis that big data analytics has a significant positive impact on improving the overall privacy and security management for the UK-based banking sector. This study will positively contribute to the development of advanced policies and strategies for banking companies to improve their infrastructure for the adoption of big data analytics.

Aims, objectives, and research questions/hypotheses

Aims

The aim of this research is to critically investigate and examine the contribution of big data analytics in enhancing privacy and security in the banking sector of the UK.

Objectives

- To assess the role of big data analytics in enhancing privacy and security in the banking sector of the UK.
- To study the influence of big data analytics on customer data protection and regulatory Compliance.
- To evaluate the use of big data analytics to detect and prevent financial or fraudulent Crimes.
- To determine the usefulness of big data analytics to enhance incident response and risk management in the banking sector of the UK

Research questions

1. What is the significance of big data analytics in enhancing privacy and security in the banking sector of the UK?
2. Why is the influence of big data analytics on consumer data protection and regulatory compliance significant?
3. How do big data analytics detect and prevent financial or fraudulent crimes?

Methodology

In this research, the researcher will conduct secondary research which can help in collecting data related to how big data analytics can help banking companies maintain data security. In this regard, the researcher will use interpretivism research philosophy which can help in gathering a subjective perspective on the particular topic. Interpretivism research philosophy is generally formed based on the subjective perspective of positivism research philosophy (Alharahsheh and Pius, 2020). Therefore, a subjective perspective of the data collected can help in understanding different areas of the banking sector that can be protected through big data analytics. The researcher will also use a deductive approach which can help in testing the research questions and collecting data based on them to generate insights. Furthermore, the researcher will use a narrative literature review as the preferred research strategy which can help in assessing different literature available on the particular topic which can help in gaining knowledge related to the research topic. A narrative literature review is suitable for the narrative synthesis of literature reviews which have been published previously (Juntunen and Lehenkari, 2021). Therefore, as the researcher will be gathering secondary data, the aforementioned method is one of the most suitable methods to analyse the data.

Furthermore, while conducting research, apart from collecting data from Google scholars using databases such as ScienceDirect, MDPI and Elsevier, it is important to analyse the data effectively to generate insights that can help in meeting the research questions. A desk-based analysis will be conducted which can help the researcher to collect and analyse data that are relevant to the topic. Furthermore, secondary data will be collected for the purpose of research as it can help in collecting data from internet sources easily and cost-effectively. However, secondary data can be changed and manipulated by others (Taherdoost, 2021). Therefore, the researcher will be using credible sources which can help in collecting reliable data. In this regard, it is important to collect data from official websites of UK banks for drawing instances and Government websites for

gaining an insight into the policies and rules regarding data privacy and security. Furthermore, the researcher will be using non-probability purposive sampling which can help in collecting data that are most relevant to the particular topic. The researcher is also required to increase focus on providing credits to the sources and authors which can help in maintaining academic integrity and avoid issues related to copyright claims. The limitation of the research can be inaccessibility to premium websites which can provide more appropriate data.

Literature review

Assessing the role of big data analytics in enhancing privacy and security in the banking sector of the UK

As per research, integrating big data analytics within the banking sector has altered the way of operations which included enhancement in the efficiency of operations, enhanced risk management, enhanced customer service and better decision-making processes (Mishra, 2023). Furthermore, with the help of big data analytics, any kind of fraudulent activities could be detected while also assessing the market risks along with credit risks. This in turn could provide enhanced privacy and security in the banking sectors of the UK. As per another research, differential privacy could be helpful to balance the use of data analysis which can be helpful to develop individual privacy of users (Hasan and Rahman, 2024). The use of data analytics could also be used to provide big data security which would include big data safety measures which help to secure large amounts of data while enhancing the security.

Furthermore, the use of big data analytics could also be helpful in enhancing privacy and security by detecting any kind of malware attacks, any other kind of security threats or unauthorised access eventually securing the banking-related data of banking organisations within the UK. Furthermore, the increased use of technological advancements like big data analytics could be due to the increasing concern of consumers regarding their data safety. As per the **Social constructivism theory**, technology is formed by the interaction between different social groups (Schot, 2020). It provides an understanding of the relationship between technology and society. In this regard, it can be stated that the use of big data analytics in the banking sector of the UK could be due to the increased demand of users.

Analysing the influence of big data analytics on customer data protection and regulatory compliance

As per research, the evolution within the banking sector including regulatory, scientific, technological and cultural changes has led to the need for developing innovative approaches that could be incorporated within the traditional tools which are still not enough to manage disorganised, complex and unstructured data (Dicuonzo et al. 2019). In this regard, the use of data analytics has not been much involved, rather the textual and predictive analysis has gained greater acknowledgement after their introduction (Dicuonzo et al. 2019). However, as cyber security has been increasing, the use of big data analytics could be beneficial to strengthen the measures related to cyber security. This is because data analytics could be useful to monitor the network activity within banks through constant monitoring.

The Technological determinism theory is focused on the relations between social and technological changes (Chan, 2023). As per this theory, technology is the main reason behind the transformations that could be witnessed within society. Moreover, as per another research, the protection of consumer data comes first and in order to address these issues the regulators must ensure that there is security in the transaction platforms (Vives, 2019). Hence, it could be stated that the increased technological advancements in every sector including the banking sector of the UK have influenced the demands of consumers regarding more strict data safety measures which could be conducted through big data analytics. Furthermore, big data analytics includes deep learning and natural language processing which could help organisations to comply with regulatory frameworks and align their operations accordingly and modify them if required.

Analysing the role of big data analytics to detect and prevent financial or fraudulent crimes

In order to analyse risks, text data can help by providing rich information (Cheng *et al.* 2021). Therefore, it can be seen that collecting data can help a financial company such as a bank to collect data which are suitable for providing safety related to data theft. In this regard, it is important for companies to increase focus on big data analytics which can help them to mitigate issues related to financial crimes. With the help of big data, the companies will be able to collect huge amounts of textual data which can further facilitate the process of analysing potential risks. This can help them avoid issues related to financial loss by taking important measures which can potentially violate company policy. However, it is also stated that advancements in technologies and technical skills are available to criminals which can make it more difficult to fight criminal offences (Nicholls *et al.* 2021). Therefore, advances in technologies are helping companies to increase focus

on taking measures to avoid risks related to financial loss, these technologies are also helping criminals to commit crimes that are difficult to track and mitigate.

However, big data analytics can help in tracking the patterns of criminals committing crimes which can help the banking sector to track the movement of these criminals which can help in mitigating the issue. Big data is used as an umbrella term which defines a huge amount of data which contains information on different business fields, industries and human behaviour (Nobanee *et al.* 2021). Therefore, it can be seen that big data analysis can help a company to track and understand the behaviour of a criminal who can potentially impact the company. In this regard, it is important for them to utilise the technology to understand what are the area's most susceptible and can be targeted by criminals. This can further help them reduce the chances of occurring financial crimes.

Determining the usefulness of big data analytics to enhance incident response and risk management in the banking sector of the UK

Big data analytics help to integrate real-time threat intelligence mechanisms within the security management strategies of organisations and provide endpoint detection and response solutions (Mughal, 2022). Big data analytics help to improve the threat-hunting processes that allow organisations to plan effective strategies to respond accordingly and effectively. Big data analytics help to improve data arrangement for high-frequency trade, evaluate financial regulations, and identify credit risks and sentiments (Hasan *et al.* 2020). Rapid threat hunting and threat identification from diversified sources allow financial companies to improve their risk mitigation and risk assessment processes. Real-time threat identification and threat intelligence enhancement have a positive impact on integrating effective risk management strategies. In order to improve the security and privacy method, HSBC has developed a partnership with Databricks that allows the company to utilise a unified data analytics platform for centralising all aspects of its data analytics processes (Databricks, 2024).

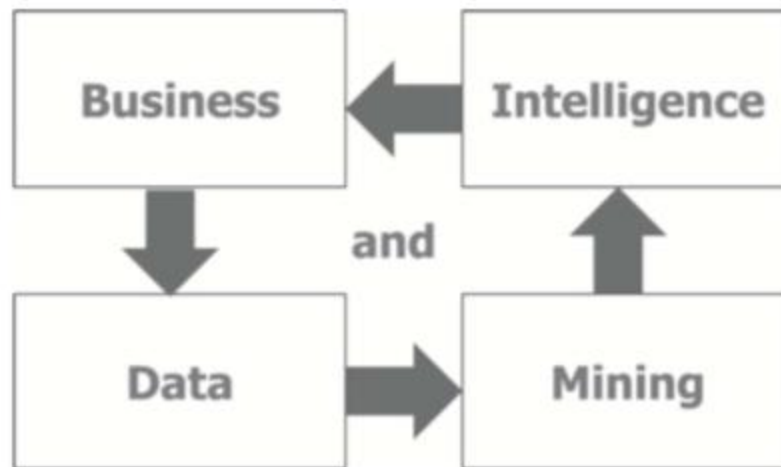


Figure 1: Role of data mining and intelligence on improving data analytics

(Source: Bharadiya, 2023)

It has been identified that data analytics have a positive impact on improving data mining processes which contribute to enhancing business intelligence (Bharadiya, 2023).

For instance, big data analytics could be helpful in order to collect as well as analyse every information regarding a threat from various kinds of external sources. This could help organisations within the banking sector of the UK to enhance their incident response by gathering sufficient information about the risks and managing risks effectively. As per research, big data analytics could be helpful in dealing with uncertainty in real time, risk management, and predicting successful developments in real time (Urbinati et al. 2019). In this regard, it could be stated that with the help of big data analytics, the organisations within the banking sector of the UK could use these data analytics to mine data and use the intelligence data mining process to assess risks, develop mitigation plans and be ready to prevent risks or mitigate them immediately if any risk arises.

Literature gap

The existing literature has provided a detailed understanding regarding the potential use of big data analytics in dealing with enhancing privacy and security, enhancing customer data protection and regulatory compliance, detecting fraudulent activities and also developing effective risk management plans. However, there is a major gap in the literature regarding the practical implementation of big data analytics and the positive impacts of those tools in enhancing security and privacy in real organisations within the banking sector of the UK. Moreover, there is also a

major gap related to the challenges faced by real organisations in implementing these big data analytics within their operations.

Limitations

This research study involves secondary data collection processes for evaluating the role of big data in improving the security of the UK-based banking sector. The use of qualitative non-numeric data is a major limiting factor for this study as non-numeric data provides an overview of the qualitative impact of big data analytics. Additionally, the guidance and restriction on word count significantly act as a limiting factor as they restrict the evaluation of different concept in more detail. The lack of quantitative data significantly impacts on the reliability and credibility of the findings as it lacks up-to-date and primary research.

Ethical considerations

Data privacy and confidentiality as well as bias and objectivity are the major ethical aspects that need to be considered while conducting the data analysis and data interpretation processes. The narrative literature review is prone to selection biases and certain case studies and articles might be favoured over others based on their alignment with research findings and hypothesis. Transparency and accountability are additional ethical aspects that need to be considered and the researcher will be transparent about the data sources, data analysis method and data interpretation strategies. In order to enhance the transparency about data sources for reduce biases that are associated with data sets, researchers should focus on implementing pre-registration of secondary data sources (Baldwin *et al.* 2022). The researcher will focus on ethically handling intellectual property and copyright by avoiding plagiarism and respecting the copyright regulations of the UK.

Timeframe

[Refer to appendix]

Conclusion

In conclusion, it can be stated that big data analytics can help a company collect and analyse huge amounts of data which can facilitate business operations. In this regard, big data analytics can help a bank develop strategies which can increase the security of consumer data. Considering the involvement of financial loss, it is important for banks to implement strategies which can help them to increase data security. Big data analysis can help a company to identify and track patterns of criminals who can potentially damage the financial wealth of a bank and its related consumers.

In this regard, the researcher will identify different aspects that can be protected through this advancement of technology. The researcher will use a secondary data collection method which can help them to collect data that are easily available on the internet. The researcher will also use a narrative literature review which is effective in analysing secondary data.

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Appendix

Activities during research	1 st Week	2 nd Week	3 rd Week	4 th Week	5 th Week	6 th Week	7 th Week
<i>Developing problems</i>							
<i>Formulating aims and objectives</i>							
<i>Methodology followed in the research</i>							
<i>Literature search and review</i>							
<i>Collection of secondary data for research</i>							
<i>Thematic Analysis and interpretation</i>							
<i>Formulating conclusion and recommendations</i>							
<i>Final submission of the project plan</i>							

Table 1: Gantt chart

(Source: Created by self)