Application of Business Analytics Tools in Improving Banking Operations in London

Sholokwu, Boniface Monday
The University of Law Business School

Abstract
The integration of Business Analytics tools into banking operations has emerged as a pivotal strategy for financial institutions seeking to enhance efficiency, customer service, and overall performance. This study delves into the application of business analytics tools in improving banking operations within the dynamic financial landscape of London. As the banking sector increasingly relies on data-driven insights, this research investigates how these analytics technologies influence customer service, staff motivation, and cost management. Through an exploration of London's financial institutions, the study provides valuable insights into how business analytics influences operational processes, customer interactions, and strategic decision-making. Secondary data collection was used as the technique of data collection for this investigation and using data provided through review of financial institution reports and other studies. The chosen data analysis method for this study was a thematic analysis and spearman's rank order correlation coefficient. The study revealed that: employing Business Analytics tools have significantly increased the banking operations in London through customer service delivery, protection of the customer's investments, staff productivity and motivation. It was recommended that banks should invest in Advanced analytics technology to improve customer service delivery, Quality assurance & data governance to protect client investments and data, Skill development and continuous staff training to improve productivity, Customer-centric analytics to improve customer service delivery, Collaboration and knowledge sharing to reduce bank spending.

Keywords: Business Analytics, Cost Management Customer Service, Financial Institutions, Staff Motivation, Technologies

1.0 INTRODUCTION

The rapid advancement of technology in the current digital era has caused a radical change in how firms run their operations. Organisations across a range of sectors are now utilising the power of business analytics to get critical insights and make educated decisions due to the rise of data as an asset (Niu et al., 2021). Among these industries, the banking sector has the greatest potential to gain significant advantages from business analytics tools due to its high dependence on data. By utilising these technologies, banks gain access to insightful data, promote data-driven decision-making, and improve the effectiveness and efficiency of their daily operations.

The banking sector plays a vital role in the global economy by managing risks, providing lending and investment opportunities, and facilitating critical financial transactions. There is a wealth of untapped data with enormous potential as the banking industry continues to produce a massive and diversified volume of data at an unprecedented rate (Nateghi and Aven, 2021). Banks use this data wisely to improve operational efficiency, client experiences, and financial

success. According to Conboy et al. (2020), banks get valuable insights from this vast amount of data through business analytics solutions, allowing them to make data-driven choices and maintain an advantage in a highly competitive environment.

The process of deriving helpful knowledge from data through statistical analysis, predictive modelling, data mining, and other methods is known as business analytics (Shao et al., 2022). With the help of these technologies, companies turn raw data into information that can be used for strategic planning and informed decision-making. By implementing business analytics technologies, banks acquire an in-depth understanding of consumer behaviour, market trends, and operational inefficiencies.

Enhancing customer service is one of the main advantages of using business analytics technologies in banking operations. Banks learn more about the requirements and expectations of their customers by examining consumer data like transaction history, preferences, and feedback (Shahid et al., 2022). This makes customised customer experiences, targeted marketing initiatives, and product suggestions possible. Predictive analytics is used by banks, for instance, to foresee consumer demands, such as by providing loan products or investment possibilities based on the client's financial profiles.

Additionally, business analytics tools are quite helpful in raising staff motivation in the banking industry. Staff motivation is the fuel that employees need to be productive in their working sections. Banks discover areas for improvement and provide focused interventions by examining staff data, including performance measurements, satisfaction surveys, and training records (DeChant et al., 2019). For instance, banks utilise analytics to recognise and reward top-performing staff members, promoting a culture of incentive and making sure that productivity is upheld. Analytics also assist in identifying skill gaps and offering customised training programs to improve staff capabilities. The figure below shows some applications of Business Analytics in banks.
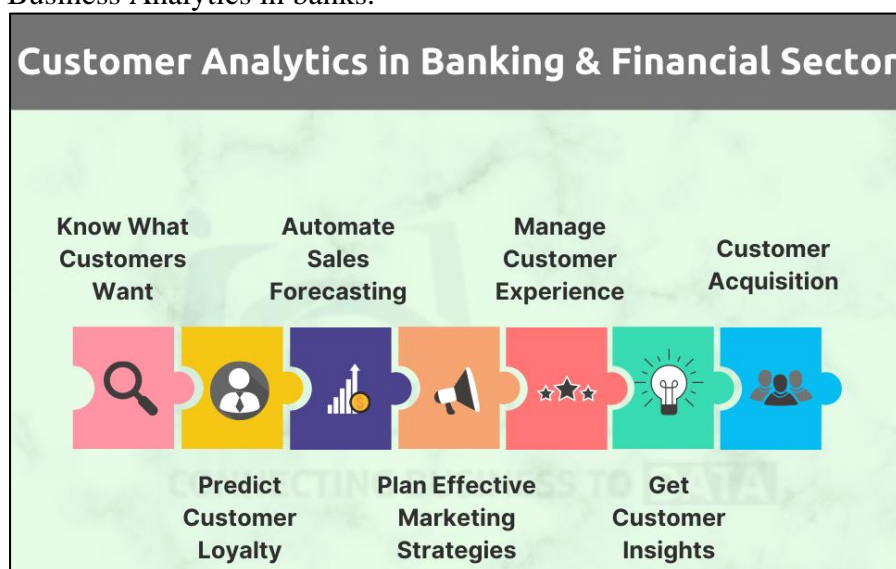

Figure 1. Application of Business Analytics

Source: https://doi.org/10.47738/ijiis.v5i2.132.

In the realm of the UK's banking landscape, several prominent institutions are leveraging the potential of business analytics technologies to transform their operations. Take HSBC, a global banking giant with substantial UK operations. Through the utilisation of business analytics

tools, HSBC taps into vast reservoirs of customer data and market insights. This facilitates the analysis of customer behaviours and preferences, enabling personalised services and the identification of cross-selling prospects. Similarly, Barclays, a major player in the UK banking sector, employs business analytics to refine customer service, drawing insights from transaction data to craft tailored banking experiences and streamline processes (Arif, Aslam, and Hwang, 2020). Meanwhile, Lloyds Banking Group employs analytics to comprehend customer preferences and behaviours, thus enhancing their experience while also employing predictive modelling and data mining to bolster risk management strategies in lending and investments. NatWest Group identifies avenues for revenue growth by scrutinising customer spending habits, while Santander UK optimises revenue streams and informs lending decisions through data-driven analytics. Standard Chartered UK employs analytics to unearth operational inefficiencies and enhance customer service by encouraging employee productivity by motivating them.

The table that outlines specific examples of how business analytics tools are being used to improve banking operations in London.

Table 1. Examples of uses of Business Analytics

Banking Institution	Use of Business Analytics	Benefits and Outcomes
HSBC	-Analyzing customer data and market insights to understand customer behaviors and preferences.	- Personalized services for customers. -Identification of cross-selling opportunities.
Barclays	-Refining customer service by drawing insights from transaction data.	- Tailored banking experiences for customers. - Streamlined processes leading to improved operational efficiency.
Lloyds Banking Group	-Understanding customer preferences and behaviors. -Using predictive modeling and data mining for risk management.	-Enhanced customer experiences. Improved risk management in lending and investments.
NatWest Group	-Scrutinizing customer spending habits to identify revenue growth opportunities.	- Identification of new revenue streams. -Better targeted marketing strategies.
Santander UK	-Optimizing revenue streams. - Informing lending decisions through data-driven analytics.	- Increased profitability. -More informed lending practices.
Standard Chartered UK	-Unearthing operational inefficiencies. -Enhancing customer service through employee productivity.	- Improved operational processes. -Enhanced customer satisfaction.

These endeavours collectively harness data's potential to elevate customer experiences and optimise revenue and operational efficiency. However, challenges surrounding data quality,

security, privacy, and talent acquisition necessitate careful consideration for the full realisation of these benefits (Martino, 2021). This study discusses the application of business analytics tools in improving banking operations in London. Appendix 1 shows top banks in UK by total assets (GBP, Billion).

1.1 Conceptual Framework

The conceptual framework of this study provides examples of the connections between the relevant variables. Customer service delivery, staff motivation, the safety and security of client investments, and employee productivity are the dependent factors, whereas business analytics technologies are the independent variable. The concept illustrates how applying business analytics techniques to the setting of London-based banking operations has a beneficial impact on these dependent variables. The study intends to offer insights into the influence of business analytics tools on enhancing banking operations by studying these links.
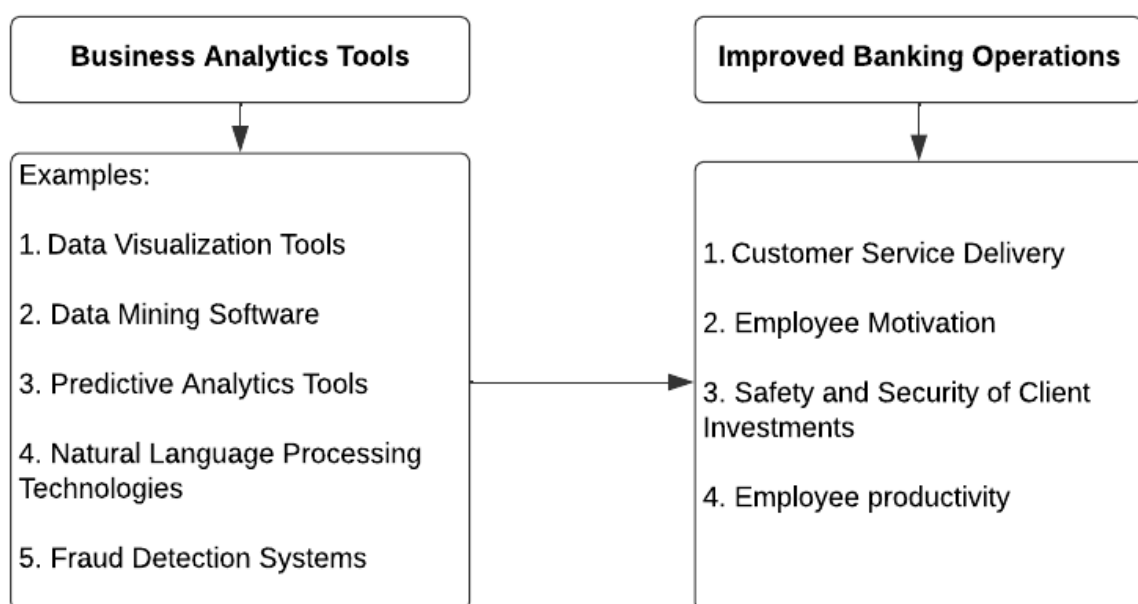
1.2 The objective of this Study

The primary goal of this research is to examine how Business Analytics tools can be used to enhance London's financial institutions. The study will produce helpful knowledge by analysing the implications of Business Analytics on customer service delivery, staff motivation and productivity, and cost management within the banking industry. The results of this study will help London's financial institutions become more effective and efficient overall, resulting in better customer service, higher staff output, and more effective cost-control measures.

2.0 LITERATURE REVIEW

This chapter includes an assessment of the literature that investigates the body of knowledge, ideas, and research findings around the use of business analytics tools in banking operations, emphasising the London region. The literature review concludes by listing the knowledge gaps in the field. These knowledge gaps point to areas that want additional research and empirical

inquiry. The highlighted gaps support the need for this study's execution and give justification for its aims, methodology, and research questions.

2.2.1 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) offers a theoretical framework for comprehending how technology is adopted and used inside businesses. It looks at the variables that affect people's intentions to utilise a certain technology and how this translates into actual usage (Kamal, Shafiq and Kakria, 2020). Perceived utility and perceived usability are the two main building blocks.

When using TAM to examine the adoption of business analytics tools in banking operations, perceived usefulness is connected to analytics technologies' advantages in boosting operational effectiveness, strengthening decision-making procedures, and optimising customer experiences (Amir et al., 2020). These resources are perceived by banks as important assets that boost performance and provide them with a competitive advantage. The acceptance of corporate analytics solutions also heavily depends on perceived ease (Amir et al., 2020). Bank workers are reluctant to accept these technologies if they believe they are complicated or challenging. However, tools are more likely to be adopted and used if they are user-friendly and offer clear instructions and assistance. Appendix 2 shows a conceptual model of the extended Technology Acceptance Model.

2.2.2 The Resource-Based View (RBV)

The Resource-Based View (RBV) theory is concerned with understanding how businesses maximise their internal assets and skills to gain a sustainable competitive advantage (Lubis, 2022). RBV describe how banks use these technologies as important resources to optimise their operations and improve performance in the context of banking operations and the implementation of business analytics tools.

RBV emphasises that an organisation's resources and competencies are important factors in determining its competitive advantage (Donnellan and Rutledge, 2019). Banks use business analytics technologies to improve decision-making, increase operational efficiency, and obtain insightful information from massive volumes of data by viewing them as resources. With these technologies, banks better understand consumer behaviour, market trends, and operational inefficiencies, improving their strategic position and performance. The idea highlights the significance of creating distinctive and challenging-to-replicate assets and competencies (Donnellan and Rutledge, 2019).

2.3 The Possibilities and Power of Cutting-Edge Analytics

Artificial intelligence (AI), machine learning (ML), and big business analytics are sophisticated approaches that can potentially change the banking operations sector. The application of AI and ML algorithms for credit risk assessment was the subject of research by Mhlanga (2021), which found that traditional credit risk models frequently depend on historical data and established criteria to determine creditworthiness. Another study by Boukherouaa et al. (2021) emphasises that AI and ML algorithms can evaluate enormous volumes of structured and

unstructured data, including client financial data, transaction history, and social media information, to provide more precise credit risk projections. These methods greatly improve the way decisions are made, the way credit risk is managed, and the reduced default rates.

The application of big business analytics to client segmentation and targeting was investigated in the paper by Shirazi and Mohammadi (2018). Banks use big business analytics to segment their client base more effectively because of the growth of digital channels and the availability of vast amounts of consumer data. Banks identify various client categories and adjust their product offerings and marketing tactics as necessary by examining their customers' behaviours, preferences, and transaction patterns (Kovács, Ko and Asemi, 2021). With this strategy, the institutions offer individualised experiences, foster deeper client connections, and increase customer loyalty.

2.4 Typical Banking Operations

Several important topics, including account administration, credit assessment, risk assessment, fraud detection, and regulatory compliance, have been widely explored in banking operations. Opening new accounts, monitoring client information, and offering support services are all part of account management, a crucial feature of banking operations (Andersen, Johannesen and Rijkers, 2021). For instance, Banks utilize business analytics to streamline account administration processes. They analyze customer data to identify patterns in account usage, helping in designing personalized account services and identifying potential cross-selling opportunities. According to Maiti et al. (2021), banks' difficulties in maintaining effective account management procedures include data integration, data accuracy, and client service. TAM is useful in comprehending how bank personnel use business analytics technologies for account management. Banks encourage staff to utilise analytics tools by considering how useful and simple they are thought to be to increase data accuracy, simplify procedures, and improve customer service. For instance, Business analytics technologies like AI and machine learning are employed in credit assessment. Banks analyze vast amounts of customer financial data to identify creditworthiness trends. This helps in improving the accuracy of credit decisions and reducing biases introduced by manual evaluations.

Another crucial aspect of banking operations is credit assessment. Traditional credit assessment techniques frequently rely on labour-intensive manual procedures and subjective evaluations, which introduce biases (Cedersund, 2023). Hence there is a requirement for more unbiased and data-driven methods of credit evaluation. Applying RBV theory, one comprehends how banks make the most of their internal assets, such as business analytics technologies, to enhance credit evaluation procedures (Rahman, 2023). For example, banks leverage business analytics tools to enhance credit evaluation processes. Applying the Resource-Based View (RBV) theory, banks capitalize on their internal assets, such as analytics technologies, to develop advanced credit evaluation models that rely on data-driven insights rather than subjective assessments. Banks analyse enormous volumes of data, spot trends, and make more accurate credit decisions by applying modern analytics approaches, such as AI and ML algorithms. This improves the quality of the loan portfolio and risk management.

Risk assessment and management are essential for banks to maintain stability and financial soundness. According to Syadali, Segaf, and Parmujianto (2023), banks have difficulties when detecting and evaluating several kinds of risks, including credit risk, market risk, and

operational risk. Better risk assessment and reduction are achieved using business analytics technologies, such as predictive analytics and scenario modelling. To improve risk management skills and gain a competitive edge, the RBV theory highlights the value of utilising analytics tools as useful resources.

Due to complex fraud schemes and changing regulatory requirements, banks confront increasing difficulties in fraud detection and regulatory compliance (Kurshan, Shen and Yu, 2020). Identifying fraud is greatly enhanced by using modern analytics approaches, such as anomaly detection and machine learning algorithms. TAM analyses how bank personnel adopt and use analytics solutions for detecting fraud while considering variables like perceived utility and usability (Putri, Widagdo and Setiawan, 2023).

2.5 The Link Between Business Analytics and Banking Operations

The use of business analytics technologies has demonstrated considerable promise in addressing various problems banks encounter in many operational areas. Analytics technologies have increased banks' capacity to comprehend and address client wants in service delivery. For instance, Zhang et al. (2022) study showed how sentiment analysis and customer segmentation analytics helped banks customise their services and increase client satisfaction. This application aligns with the TAM since bank personnel use analytics technologies if they believe they would help them better understand consumer preferences and behaviour.

Research by Masri and Suliman (2019) on employee motivation emphasised the value analytics tools provide to performance management and recognition initiatives. Banks identify top performers and reward them appropriately by using analytics to evaluate and analyse employee performance, which increases motivation and engagement. Using analytics tools as internal resources to boost worker productivity and gain a competitive advantage connects to the RBV theory in this application.

Research by Araz et al. (2020) on risk management showed the efficiency of analytics tools in identifying and reducing operational risks. Banks proactively manage risks by examining massive databases and seeing trends of questionable activity. In line with both TAM and RBV theories, this application. Their acceptance and use are influenced by the perception of analytics tools' value in risk assessment and the RBV's emphasis on utilising internal resources to improve risk management (Brossard, Minvielle and Sicotte, 2022).

Furthermore, analytics technologies have been extremely important in cost control and income development. According to research by Javaid et al. (2022), analytics technologies helped banks to increase revenue by streamlining operations, cutting expenditures, and optimising costs. Banks improve processes, reduce wasteful spending, and spot cross-selling or upselling possibilities using predictive analytics and data-driven insights. These applications are consistent with the TAM and RBV theories since increased acceptance and use of analytics tools result from their perceived utility and usability, improving financial performance (Brossard, Minvielle and Sicotte, 2022).

2.6 Categories of Business Analytics

Descriptive, diagnostic, predictive, prescriptive, and cognitive analytics are the five basic categories used to group numerous methodologies under business analytics. Each category offers skills used in banking operations to evaluate past data, spot trends, forecast results, suggest the best action, and make sophisticated decisions using cognitive abilities.

2.6.1 Descriptive Analytics

Descriptive analytics primarily aims to summarise historical data to provide trends and insights regarding past occurrences (Selvan and Balasundaram, 2021). Descriptive analytics are used in banking operations to evaluate client transaction data, identify trends in consumer spending, and provide reports on important performance metrics. This category aids banks in interpreting what has occurred and serves as a starting point for additional study.

2.6.2 Diagnostic Analytics

Diagnostic analytics aims to identify the causes of earlier occurrences or results. It includes analysing data to determine the causes of the contributing factors to specific events (Li, Guedes Soares and Huang, 2020). Diagnostic analytics is used in the banking industry to explore the underlying causes of operational inefficiencies, credit defaults, and client churn, among other issues (Marouani and Tick, 2023). Banks learn more about the variables affecting specific results and take remedial action by performing root cause analysis.

2.6.3 Predictive Analytics

Predicting upcoming events or outcomes requires using historical data, statistical models, or predictive analytics. Predictive analytics are used in banking operations to forecast consumer demand, evaluate market trends, and forecast the likelihood of loan default (Arora et al., 2021). Banks make informed choices, foresee hazards, and proactively handle possible problems by utilising predictive models.

2.6.4 Prescriptive Analytics

Prescriptive analytics goes beyond forecasting future results by offering recommendations on how to take the needed activities. It recommends the optimum course of action considering the provided constraints and objectives using optimisation algorithms and decision models (Lepenioti et al., 2020). Prescriptive analytics are used in the banking industry to decide on the best loan price, allocate resources effectively, or optimise investment portfolios. Banks increase performance using this category to make data-driven choices and streamline processes.

2.6.5 Cognitive Analytics

Advanced technologies like natural language processing and machine learning are used in cognitive analytics to replicate human intellect and allow computers to understand, learn, and reason (Dong et al., 2020). Cognitive analytics are used in banking operations for customer feedback sentiment analysis, chatbot interactions, or fraud detection (Palwe and Gunjal, 2021). Banks automate procedures, improve client relations, and derive deeper insights from unstructured data sources using cognitive capabilities. The table below summarises the categories of business analytics.

Table 2: Categories of Business Analytics

Analytics Category	Description	Application in Banking Operations
Descriptive Analytics	Summarises historical data to identify trends	Evaluating client transaction data
Diagnostic Analytics	Identifies causes of past events or outcomes	Exploring reasons behind operational inefficiencies
Predictive Analytics	Forecasts future events or outcomes using historical data and predictive models.	Predicting consumer demand, evaluating market trends, and assessing loan risk.
Prescriptive Analytics	Offers recommendations for optimal actions considering constraints and objectives.	Determining optimal loan pricing, resource allocation, and investment optimisation.
Cognitive Analytics	Utilises advanced technologies like machine learning to replicate human intellect and reasoning.	Analysing customer feedback sentiment, automating processes, and fraud detection.

2.7 Business Analytics Tools

By helping banks to derive insights from data and make data-driven choices, business analytics tools play a crucial role in the banking sector. The financial services industry has seen increased use of data visualisation technologies like Tableau and Power BI because of their capacity to turn complicated data into engaging visual representations (Peddoju and Upadhyay, 2020). These technologies enable banks to evaluate enormous amounts of data and display it understandably. For instance, research by Munawar et al. (2021) showed how real-time visual insights on risk exposures and trends through data visualisation tools increased the effectiveness of risk reporting.

Banks use data mining tools to glean important information and patterns from massive databases, such as IBM SPSS Modeler and RapidMiner (Sarawut and Jirapon, 2023). These technologies use sophisticated algorithms to find abnormalities, correlations, and hidden patterns in the data. Data mining techniques were utilised to identify fraudulent activity in banking transactions in research by Kaur et al. (2021), which enhanced fraud detection and prevention.

Banks create predictive models that project future events based on previous data using tools for predictive modelling like SAS Enterprise Miner and Python's sci-kit-learn module (Ben Rabia and Bellabdaoui, 2022). These technologies use statistical and machine learning techniques to identify trends and generate predictions. For instance, Cunha (2023) study used predictive modelling approaches to estimate bank client turnover, allowing proactive retention initiatives to be implemented.

Because they analyse and comprehend human language, natural language processing (NLP) technologies like sentiment analysis and chatbot systems have become popular in the banking sector (Dongbo et al., 2023). NLP systems examine chatbot interactions, social media data, and consumer reviews to extract useful information. By assessing client feedback in real-time and pinpointing areas for improvement in banking services, Mashaabi et al. (2022) showed how NLP approaches increased customer satisfaction.

2.8 Customer Service Delivery in Banking Operations

The provision of customer service is an essential component of banking operations that directly affects client satisfaction and loyalty. However, banks frequently struggle to provide individualised and effective client care due to several circumstances. A study by Goot and Pilgrim (2020) has shown a discrepancy between what customers expect from banks' customer care and what they receive. Customers expect individualised services and prompt replies from banks, yet many banks find it difficult to deliver on these demands, according to Mogaji et al. (2021). This discrepancy highlights the necessity for banks to use analytics tools and customer data to obtain insights into specific client preferences and adjust their services accordingly.

The capacity to analyse enormous volumes of customer data and derive insightful information is provided by business analytics solutions. For instance, Das and Nayak (2022) study showed how business analytics methods like segmentation and clustering are utilised to group clients according to their preferences and habits. Banks create specialised service offerings and target marketing efforts to cater to the demands of certain client categories by studying customer segmentation.

Additionally, consumer feedback analysis and customer satisfaction measurement have been done using sentiment analysis. For instance, Pantea's (2022) study used sentiment analysis techniques to analyse consumer feedback data and pinpoint areas where banking services needed to be improved. Banks proactively address consumer problems, improve service quality, and increase customer happiness by tracking customer sentiment.

2.9 Employee Motivation

Employee motivation is a key component to increase efficiency and performance in banking operations. In the financial services sector, there are issues with identifying and resolving employee motivation. Motivated employees are more engaged, effective, and dedicated to their employers. For instance, Ali and Anwar (2021) conducted a study in the banking sector that found a favourable correlation between employee motivation and work performance. The research also points out knowledge gaps about the drivers of employee motivation in banking operations and the shortage of efficient motivational treatments.

Tools for business analytics are very helpful in analysing and enhancing employee motivation. For instance, banks identify high-performing workers and acknowledge their accomplishments by evaluating employee performance data, promoting a culture of recognition and incentive. According to research by Ghatak (2022), rewarding top performers with analytics-driven interventions favours staff engagement and satisfaction.

Additionally, analytics technologies assist banks in identifying variables influencing employee engagement and motivation. Banks can pinpoint areas for improvement and provide focused interventions by evaluating employee survey data and performance measures. In research by Mishra, Singh, and Tripathy (2020), analytics tools were used to examine data on employee satisfaction and pinpoint areas that need improvement. This allowed for interventions that improved employee motivation and engagement.

The Technology Acceptance Model (TAM) provides insight into how analytics tools are seen and used in employee motivation. TAM was used in research by Heslina and Syahruni (2021) to examine bank workers' perceptions of analytics tools used for performance management. The results showed that employee intention to utilise analytics tools was highly influenced by their perceived utility and usability, affecting their motivation and performance.

2.10 Safety and Security of Customers' Investments in the Bank

The safety and security of clients' investments are paramount in the banking industry. To secure customer investments, banks must ensure data privacy, take precautions against fraud, and adhere to legal standards. A study by Kaloudi and Li (2020) emphasised the necessity for strong security measures in the banking industry and the evolving threat landscape. Also, Perkins (2023) study highlighted identity theft, phishing attempts, and data breaches as major security threats for banks and their customers. The literature emphasises how crucial it is to review and bolster security precautions to safeguard customer assets constantly.

Tools for business analytics are quite useful in boosting security precautions and defending against fraud. As an illustration, transactional data is analysed by anomaly detection methods, such as machine learning algorithms, to spot patterns suggestive of fraud. According to research by Jayasingh and Sri (2023), banks better protect their customers' money by using anomaly detection algorithms to identify and stop fraudulent transactions.

Analytics technologies also help banks comply with regulations and spot any compliance problems. Banks spot unusual trends that point to non-compliance by examining transaction data and observing activity. Banks' use of analytics tools to identify suspected money laundering activities and assure regulatory compliance was demonstrated in research by Singh and Best (2019).

2.11 Employee Productivity

In banking operations, employee productivity is crucial to operational effectiveness and efficiency. Banks, however, face difficulties in maximising staff output, including identifying

areas for development and efficiently allocating resources. Studies have shown that the banking industry has comprehension and measurement gaps regarding staff productivity. The Pawlak and Kołodziejczak (2020) study found difficulties in establishing and measuring productivity measures for various bank functions. This emphasises the demand for a systematic strategy for assessing and enhancing worker productivity.

Business analytics solutions offer insightful information about employee performance and point out development opportunities. To identify top performers and set standards for others, analytics tools, for instance, examine employee performance data such as sales metrics or transaction volumes. In research by Haleem et al. (2022), it was shown how analytics tools assist in identifying top-performing individuals in a bank's sales force, which could then lead to more effective coaching and training interventions.

Additionally, by identifying time-consuming or inefficient operations or processes, analytics systems help optimise resource allocation. For instance, transactional data is analysed using process mining techniques to spot operational bottlenecks or pointless activities. In an analysis by Šperka and Halaška (2022), process mining techniques were useful in identifying inefficiencies in loan processing, resulting in improved workflow and higher production.

3.0 RESEARCH METHODOLOGY

This chapter outlines the research methodology employed in the study. The study objectives were used to justify the selection of the research philosophy, approach, strategy, time horizon, data collection techniques, data analysis, and ethical considerations.

3.1 Data Collection

Secondary data collection was used as the technique of data collection for this investigation and using data provided through review of financial institution reports and other studies. This choice was taken since the research only uses information from secondary sources.

3.2 Data Analysis

The chosen data analysis method for this study was a thematic analysis and spearman's rank order correlation coefficient. Thematic analysis was a good choice for this study because it enables a thorough examination of the information gathered from the literature review and case studies.

4.0 DATA ANALYSIS, FINDINGS AND DISCUSSIONS

Hypothesis 1

H_{o1}: There is no significant relationship between business analytics tools and customer service delivery.

The test statistics used in testing the above hypothesis is the spearman's rank order correlation coefficient. The computation of the value of the test statistics as done using SPSS is represented in the table below.

Table 1: Spearman rank order calculation
 Correlations

			BAT	CSD
Spearman's rho	BAT	Correlation Coefficient	1.000	.630**
		Sig. (2-tailed)	.	.000
		N	32	32
	CSD	Correlation Coefficient	.630**	1.000
		Sig. (2-tailed)	.000	.
		N	32	32

 **. Correlation is significant at the 0.01 level (2-tailed).
Source: Survey data, 2023.

The statistics gave an r value of 0.630 which is a substantial correlation between the variables. The significance level for a 2-tailed test shows that the result is statistically significant, 0.000, therefore, we can reject the null hypothesis which states that "there is no significant relationship between business analytics tools and customer service delivery and accept the alternative hypothesis, "there is significant relationship between business analytics tools and customer service delivery

Hypothesis 2

 Ho2: There is no significant relationship between business analytics tools and customer's investments.

 The test statistics used in testing the above hypothesis is the spearman's rank order correlation coefficient. The computation of the value of the test statistics as done using SPSS is represented in the table below.

Table 2: Spearman rank order calculation
 Correlations

			BAT	CI
Spearman's rho	BAT	Correlation Coefficient	1.000	.863**
		Sig. (2-tailed)	.	.000
		N	32	32
	CI	Correlation Coefficient	.863**	1.000
		Sig. (2-tailed)	.000	.
		N	32	32

 **. Correlation is significant at the 0.01 level (2-tailed).
Source: Survey data, 2023.

The statistics gave an r value of 0.863 which is substantial correlation between the variables. The significance level for a 2-tailed test shows the result is statistically significant, 0.000, therefore, we can reject the null hypothesis which states that "there is no significant relationship between business analytics tools and customer's investments and accept the alternative

hypothesis, "there is significant relationship between business analytics tools and customer's investments.

Hypothesis 3

Ho₃: There is no significant relationship between business analytics tools and employee's productivity and motivation

The test statistics used in testing the above hypothesis is the spearman's rank order correlation coefficient. The computation of the value of the test statistics as done using SPSS is represented in the table below.

Table 3: Spearman rank order calculation

Correlations

			BAT	EP & M
Spearman's rho	BAT	Correlation Coefficient	1.000	.702**
		Sig. (2-tailed)	.	.000
		N	32	32
	EP & M	Correlation Coefficient	.702**	1.000
		Sig. (2-tailed)	.000	.
		N	32	32

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Survey data, 2023.

The statistics gave an r value of 0.702 which is a high correlation between the variables. The statistical significance level for a 2-tailed shows the result is statistically significant, 0.000, therefore, we can reject the null hypothesis which states that "there is no significant relationship between business analytics tools and employee's productivity and motivation and accept the alternative hypothesis, "there is significant relationship between business analytics tools and employee's productivity and motivation.

4.2 Discussion

The thorough data analysis results reported in this study offer persuasive proof of the significant and advantageous effects of business analytics tools on several important facets of London's banking operations. Financial institutions have seen revolutionary changes in how they service their clients, manage risks, and streamline operational procedures thanks to the introduction of business analytics (Rana et al., 2022; Krishnamoorthi and Mathew, 2018).

The first important finding shows that better customer service has been provided because of integrating business analytics tools into banking operations. Financial institutions have been able to customise their products and services to match the unique requirements of their customers by utilising the power of data-driven insights. The banks now have a competitive edge thanks to the increased level of personalisation that has led to better levels of customer contentment (Arnott et al., 2017) (Vidgen et al., 2017). According to Mohammad et al. (2022), financial institutions may boost their reputation by offering excellent client experiences and consolidating their market presence through better customer retention and good word-of-mouth recommendations.

Another crucial area that has been significantly impacted by the implementation of business analytics technologies in the banking sector is employee engagement and productivity

(Ramanathan et al., 2017). The data findings show that banks have successfully implemented analytics-driven performance recognition and reward systems to promote an office atmosphere that fosters employee productivity. Financial institutions foster a culture of excellence and devotion among their employees by recognising top performers and their accomplishments. Additionally, business analytics technologies have given banks the ability to pinpoint workers' training requirements and skill gaps. This helps facilitate their ongoing professional growth. Employees thus experience a sense of worth and support, which boosts overall productivity (Al-Okaily et al., 2022).

The strategic use of business analytics in banking operations has considerably improved risk management and customer investment protection. The information shows that banks have proactively used analytics technologies to discover possible hazards and weaknesses in their processes. Financial institutions strengthen their long-term relationships with their consumers and inspire confidence in the banking services they offer by promptly identifying and managing risks. This builds trust and credibility with their customers (The Bank of London, n.d.).

The good influence of business analytics on cost management and operational efficiency is one of the most important findings. Banks have been able to discover inconsistencies and improve their operations thanks to data-driven decision-making (Vidgen et al., 2017).

Financial institutions have attained the best possible use of resources which has increased overall operational efficiency by strategically allocating resources to areas with the best potential for revenue. The banking sector will benefit from sustained development and ongoing competition if these cost savings are reinvested in cutting-edge technology and customer-focused activities.

5.0 CONCLUSION AND RECOMMENDATIONS

This study examined the application of Business analytics technologies in improving banking operations in London. The study employed secondary data, which was gotten from Financial Times and articles, Bank of England reports and the reports of other commercial and investment banks operating in United Kingdom. The study revealed that: employing Business Analytics tools have significantly increased the banking operations in London through customer service delivery, protection of the customer's investments, staff productivity and motivation.

In light of the observed findings, it is recommended that:

1. ***Investment in Advanced Analytics Technology to Improve Customer Service Delivery-***London's banking institutions should set a high priority on making regular, significant investments in advanced analytics technology. These cutting-edge technologies have already shown that they can produce forecasts that are more accurate and provide deeper insights.
2. ***Quality Assurance & Data Governance to Protect Client Investments and Data-***Data governance and quality assurance methods must be given top priority if business analytics programs are to be successful. To maintain data accuracy, financial organisations must set up strong data governance systems.
3. ***Collaboration and Knowledge Sharing to reduce bank spending-***To fully realise the promise of business analytics, financial institutions must aggressively encourage a culture of collaboration and information sharing. Silos between teams and departments need to be broken down to get a full picture of how the bank is operating. This helps reduce bank spending and increases revenues since employees get to teach each other and share ideas and how to deal with certain circumstances.

4. ***Skill Development and Continuous Training to improve productivity -***The continual training and skill development of banking professionals must be prioritised, considering the fast-changing business analytics technology. Employees that receive extensive training are given the most up-to-date methods for utilising analytics.

5. ***Focus on Customer-Centric Analytics to Improve Customer Service Delivery-***A strategic priority for financial institutions should be the adoption of customer-centric analytics approaches. This will enable them to have a thorough grasp of their clientele. Banks should also foster a customer-centric culture by continually improving client interactions. This supports their role as dependable partners in their clients' financial journeys.

REFERENCES

Ajah, I.A. & Nweke, H.F (2019). Big data and business analytics: Trends, platforms, success factors and applications. *Big Data and Cognitive Computing*, *3*(2), p.32. https://www.mdpi.com/2504-2289/3/2/32

Ali, B.J. & Anwar, G. (2021). An Empirical Study of Employees' Motivation and Its Influence on Job Satisfaction. [online] papers.ssrn.com. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3822723.

Cedersund, M. (2023). Artificial Intelligence in banking: the future of the banking work environment. [online] www.theseus.fi. Available at: https://www.theseus.fi/handle/10024/803304 [Accessed 17 Jul. 2023].

Davenport, T.H.(2018). From analytics to artificial intelligence. *Journal of Business Analytics*, *1*(2), pp.73-80. https://www.tandfonline.com/doi/abs/10.1080/2573234X.2018.1543535

Mardiana, S. (2020). Modifying Research Onion for Information Systems Research. *Solid State Technology*, *63*(4), pp.5304-5313

Masri, N.E. & Suliman, A. (2019). Talent Management, Employee Recognition and Performance in the Research Institutions. Studies in Business and Economics, 14(1), pp.127–140. doi https://doi.org/10.2478/sbe-2019-0010.

Melnikovas, A. (2018). Towards an Explicit Research Methodology: Adapting Research Onion Model for Futures Studies. *Journal of Futures Studies*, *23*(2).

Mhlanga, D. (2020). Industry 4.0 in Finance: The Impact of Artificial Intelligence (AI) on Digital Financial Inclusion. *International Journal of Financial Studies*, [online] 8(3), p.45. doi https://doi.org/10.3390/ijfs8030045.

Nateghi, R. & Aven, T. (2021). Risk Analysis in the Age of Big Data: The Promises and Pitfalls. *Risk Analysis*. doi https://doi.org/10.1111/risa.13682.

Pantea, K. (2022). Handbook of Research on Consumer Behavior Change and Business Analytics in the Socio-Digital Era. [online] Google Books. IGI Global.

Perkins, N.B. (2023). Spreading a Digital Disease: The Circuit Split on Data Breaches and Its Effects on the Health Sector. Indiana Health Law Review, [online] 20(2), pp.435–459. doi https://doi.org/10.18060/27442.

Rahman, Md. M. (2023). The Effect of Business Intelligence on Bank Operational Efficiency and Perceptions of Profitability. FinTech, 2(1), pp.99–119. doi https://doi.org/10.3390/fintech2010008.

Scott, L. (2014). *Figure 2: The research onion (Saunders et al., 2012)*. [online] ResearchGate. Available at: https://www.researchgate.net/figure/The-research-onion-Saunders-et-al-2012_fig2_282912642.

Shirazi, F. & Mohammadi, M. (2018). A big business analytics model for customer churn prediction in the retiree segment. International Journal of Information Management. doi https://doi.org/10.1016/j.ijinfomgt.2018.10.005.

The Bank Of London. (n.d.). *The Bank of London: Home*. [online] Available at: https://thebankoflondon.com/.

Wandera, R. (2022). Customer Acceptance Analysis of Islamic Bank of Indonesia Mobile Banking Using Technology Acceptance Model (TAM). IJIIS: International Journal of Informatics and Information Systems, 5(2), pp.92–100. doi https://doi.org/10.47738/ijiis.v5i2.132.