Enhancing Banking Officer's Competency and Data Security Frameworks in Digital Transformation

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Abstract
The banking sector, as a cornerstone of national economies, faces unprecedented challenges due to the rapid digitalisation of financial services. While digital tools have revolutionised loan

management processes, enhancing operational efficiency and decision-making, they have also introduced significant risks, including cyber threats, fraud, and data breaches. This conceptual paper explores the critical intersection of professional competency and data security in the evolving role of banking loan officers, focusing on how digital tools can support their decision-making capabilities. Loan officers play a pivotal role in mitigating fraud risks through informed judgement and risk assessment, but their efficacy depends on the integration of advanced information technology systems and robust internal controls. This paper examines the behavioural and technological factors influencing loan officers' effectiveness and highlights the importance of aligning professional expertise with digital innovations to strengthen banking operations. It underscores the need for continuous competency enhancement and strategic IT integration to safeguard sensitive information and ensure secure, efficient loan management. The findings offer valuable insights for banks, regulators, and policymakers aiming to enhance the resilience of financial institutions in the digital age. The paper concludes by identifying research gaps and outlining directions for empirical studies on the relationship between professional competency, data security, and digital tool utilisation.

Keywords: Professional Competency, Data Security, Digital Tools, Loan Management, Banking Sector

Introduction

The banking sector, as a cornerstone of national economies, has undergone significant transformation in recent years, primarily driven by rapid technological advancements and increasing reliance on digital platforms. While these innovations have enhanced operational efficiency, they have also introduced a set of new challenges—particularly in managing loan processes and securing sensitive financial data. The complexity of modern banking systems, coupled with escalating cyber threats such as data breaches and social engineering, has heightened the need for stronger internal controls and robust data security. A survey by Klynveld Peat Marwick Goerdeler (KPMG, 2019) highlights key risks faced by banks in the Asia-Pacific region, where cyber threats, data breaches, and fraudulent activities have emerged as top concerns.

Loan management, as one of the largest components of a bank's credit risk, plays a pivotal role in the stability and soundness of banking institutions (Jin et al., 2023; Brown & Moles, 2014). However, inefficiencies in handling loan applications, coupled with the rising prevalence of fraud, create vulnerabilities that can destabilise a bank's operations. Fraudulent activities not only result in financial losses but also undermine customer trust and confidence. As banks handle vast amounts of personal and financial information in loan processes, robust data security measures are essential to protect against cyber-attacks and financial crime (Fukuyama et al., 2024: Ross & Hannan, 2007).

The increasing reliance on digital platforms has brought about both opportunities and risks for banking institutions. On the one hand, digital tools have streamlined loan management, improving processing times and decision-making efficiency. On the other hand, these tools have also expanded the attack surface for cybercriminals. The digitalisation of financial services has made data security a critical factor in ensuring the integrity of banking operations (Bianchi, 2021). A failure to implement adequate security measures can lead to significant financial losses, reputational damage, and legal repercussions (Kalimoldayev,

2024; Subbotina, 2009). Thus, safeguarding sensitive information is integral to mitigating fraud risks and enhancing decision-making, particularly in loan management (Sledgianowski et al., 2017).

In this evolving landscape, professional competency—the knowledge, skills, and judgement of banking loan officers—plays a vital role in managing risks associated with loan approval processes. Loan officers are responsible for assessing the credibility of borrowers and identifying potential fraud risks by scrutinising financial statements, transaction patterns, and client behaviours (Goedde-Menke & Ingermann, 2024; ACFE, 2020). Their ability to make informed judgements can significantly reduce fraud risks, but this competency must be supported by advanced information technology systems and strong internal controls (Masciandaro, 1999). Technology can assist officers by automating routine tasks such as risk assessments and fraud detection, allowing them to focus on more complex, high-value decisions.

The relation between professional competency and digital tools has become increasingly important in the loan management process. Information technology systems, when integrated with internal control frameworks, can serve as a force multiplier, improving the efficiency of risk management and decision-making. This combination of human expertise and technological support is essential for maintaining data security and ensuring operational soundness. As banks continue to adopt digital solutions, the evolving role of loan officers, supported by these tools, becomes central to building secure, reliable, and resilient banking systems.

This conceptual paper explores how the integration of professional competency and digital tools enhances both loan management processes and data security in the banking sector. By doing so, the paper aims to provide a robust framework for understanding how these two elements—competency and technology—can work together to mitigate fraud risks and safeguard banking operations. The findings provide practical implications for banks, regulators, and policymakers seeking to strengthen the resilience of the financial sector in the digital age. As banking institutions continue to digitalise, understanding the evolving role of loan officers and the tools they use will be critical in developing strategies that protect against emerging threats while supporting sustainable growth.

Development of Digital Banking and Information Technology in Banking Industry
The banking industry faces increasing challenges in managing loan applications, especially with the rising sophistication of fraud techniques and inadequacies in current internal control mechanisms. Loan application fraud poses a serious threat not only to the financial stability of banking institutions but also to the wider economy and individual welfare (Amoh et al., 2021; Nobanee & Ellili, 2018). Despite advancements in automated risk-screening tools, fraudsters continue to exploit vulnerabilities in banking systems, often exacerbated by the lack of professional competency among loan officers in effectively identifying and managing loan-related risks.

Previous research has highlighted that many bank officers struggle with due diligence, leading to erroneous decisions in loan approvals (Nyamongo & Temesgen, 2013). These errors are frequently attributed to insufficient knowledge, inadequate training, and the absence of

a robust internal control framework. Consequently, fraud not only compromises the financial health of banks but also diminishes customer trust, adversely affecting market share and long-term profitability (Asmah et al., 2020).

Furthermore, the rapid advancement of digital technologies and information technology (IT) systems has presented both opportunities and challenges for the banking sector. While digital tools have improved operational efficiency and data security in loan management, many banks have yet to fully integrate these systems into their internal control frameworks, leaving significant gaps that can be exploited by cybercriminals and fraudsters (Härle et al., 2015). The relationship between the professional competency of loan officers and the utilisation of IT tools remains underexplored, especially in terms of how these factors can work together to strengthen internal controls and enhance data security in loan management.

Given these challenges, this study seeks to explore how the integration of professional competency with the effective use of digital tools can enhance loan management processes. It aims to address a critical gap in the literature by examining how individual competencies, organisational practices, and technological innovations can jointly mitigate fraud risks and fortify internal control systems in the banking sector.

Bank officers play a central role in assessing loan application risks, interacting directly with clients (Johnston & Abbott, 2005; Hinterseer, 2001). However, their effectiveness in identifying risky clients has been questioned. Some studies argue that bank officers focus more on financial goals than on risk assessment (Favarel-Garrigues et al., 2011; Dhillon et al., 2013). Nevertheless, professionally trained officers are crucial in detecting fraud and safeguarding the institution from financial risks (Kemal, 2014). The risk-based approach (RBA), as endorsed by the Financial Action Task Force (FATF, 2014), offers a practical framework for managing risks efficiently. Yet, the ambiguity in red flags and regulatory guidelines (Rahman, 2013) remains a challenge, making advanced digital tools essential for improving accuracy in risk identification.

Judgement and Decision Making (JDM) in Loan Management
Professional judgment is pivotal in the decision-making process, particularly in uncertain situations (Heyrani et al., 2016; Lipshitz & Shulimovitz, (2007). While JDM is well-documented in accounting and auditing (Norman et al., 2010; Trotman, 1998), limited attention has been given to its application in banking, especially concerning risk judgment in loan evaluations. Decision-making processes in banking rely heavily on professional competency and the availability of timely, accurate information, both of which can be enhanced by digital tools that improve data quality and security (Andersson, 2004; Koonce et al., 2024).

In the fast-paced banking environment, loan officers often operate under constraints like limited time and information. Behavioural Decision Theory (BDT) suggests that decision-makers rely on heuristics in such scenarios (Mosier & Fischer, 2010). Advanced IT systems can mitigate these constraints by providing structured and secure data, reducing errors, and supporting better decision-making (Ogunmokun et al.,2024). This highlights the critical

intersection between professional competency and digital tools in ensuring robust internal controls and data security.

Loan Management in Banking Institutions

Loans are fundamental components of the financial system, providing liquidity to both businesses and individuals (CPE, 2021). Banks act as critical information intermediaries, assessing borrowers' creditworthiness through exclusive data that informs market signalling (Banna et al., 2018; Lummer & McConnell, 1989). The loan assessment process requires a high degree of professional competency among bank officers, who must evaluate multiple dimensions of a borrower's profile, such as character, capacity, capital, conditions, and collateral (Haron & Shanmugam, 1994). Effective judgment by loan officers is essential for reducing risks, as poor lending decisions can result in substantial financial losses for banks (Carabelli, 2019; Apergis, 2024).

In recent years, the integration of information technology (IT) into loan management has enhanced the accuracy and efficiency of risk assessments (jin et al., 2023). Digital tools allow for improved data analysis, streamlining loan screening processes, and strengthening internal control systems within banks (Wei et al., 2018; Pancotto et al., 2024). For example, regulatory frameworks, such as those set by Bank Negara Malaysia, stress the need for rigorous loan approval processes, highlighting the importance of precise borrower evaluation (BNM, 2021). By combining advanced IT systems with professional expertise, banks can not only safeguard data security but also improve fraud detection and strengthen their internal control mechanisms (Wang et al., 2019). Therefore, a synergy between professional competency and IT utilisation is crucial for securing and optimising loan management practices.

Fraud in Banking Institutions

Fraud poses a significant threat to financial institutions, damaging reputations and eroding relationships with stakeholders, including customers, suppliers, and business partners (Sanusi et al., 2015). Fraudulent activities, such as falsifying financial documents to obtain loans, have become more sophisticated, with tactics evolving to include identity theft and unauthorised account access (Sanusi et al., 2015; Abu-Shanab & Matalqa, 2015). (PYMNTS, 2020). This underscores the need for robust internal controls and competent loan officers who can detect and mitigate such risks.

Traditional fraud detection methods in loan management have struggled to adapt to these sophisticated fraud schemes, often leading to inefficiencies and missed fraud cases (Eweoya et al., 2019). Financial losses from such frauds are significant, costing the banking sector billions each year (Sakawa, & Watanabel, 2022; Masters, 2008). In response, financial institutions have increasingly turned to forensic accountants and advanced fraud detection technologies to address this global issue (Gottschalk, 2014; Mason & Bohm, 2017).

The COVID-19 pandemic exacerbated the economic challenges faced by banks, with the financial strain contributing to increased fraud risks. During this time, banks have seen a rise in loan defaults and other financial crimes, placing further stress on their internal control systems (McKinsey & Company, 2020: Erum et al.,2024). The use of cutting-edge technology

has been instrumental in mitigating some of these risks, but ongoing vigilance is required as fraud schemes continue to evolve (Carminati et al., 2015).

In Malaysia, cybercrime has surged, with fraud being one of the leading forms of financial crime reported (Tariq, 2021). The economic downturn during the pandemic highlighted vulnerabilities in the banking sector, particularly in relation to digital security. Fraudsters have exploited these weaknesses, further emphasising the importance of both professional competency in risk management and the use of IT to safeguard against evolving threats.

Loan Application Fraud
Loan application fraud is a significant challenge for financial institutions, characterised by individuals intentionally misrepresenting their identities and financial situations to obtain loans unlawfully (Zhan & Yin, 2018; Dorfleitner & Jahnes, 2014). This type of fraud underscores the need for effective internal controls and the professional competency of loan officers in accurately assessing borrower profiles.

Loan risk, broadly defined as the probability of borrowers defaulting on their repayments, is compounded by unethical practices and weak internal controls (Chen, 2022; Atkins et al., 2015). The traditional "5 Cs" of credit assessment—character, capacity, capital, collateral, and conditions—remain fundamental to evaluating loan applications (Brown & Moles, 2016). However, to adequately manage loan risks in an increasingly complex financial environment, institutions must adopt a risk management framework that integrates professional judgment with technological innovations.

The integration of IT into loan management enhances internal controls, enabling banks to assess and monitor loan applications with greater precision (Błaszczyński et al.,2021). As digital banking continues to rise, leveraging advanced IT systems allows banks to bolster data security, detect fraud more efficiently, and enhance the overall effectiveness of their risk management strategies (Zhao et al., 2023). The interplay between professional competency and IT support is thus critical in addressing loan application fraud and ensuring the financial stability of banking institutions (Błaszczyński et al., 2021; Chen et al., 2022).

Framework on Judgment and Competency in Banking Loan Management
Theories on Judgement and Competency
Theories such as Behavioural Decision Theory, Attribution Theory, and Social Cognitive Theory illustrate the relationship between professional skills, decision-making, and the environment (Edwards, 1961; Kelley, 1967; Bandura, 1986). In the context of loan management, the integration of digital tools not only enhances the cognitive capabilities of loan officers but also strengthens internal control systems and safeguards sensitive financial data. By combining professional competency with evolving digital tools, banking institutions can significantly enhance risk assessments, improve data security, and streamline decision-making processes in loan management.

The exercise of professional judgement in banking loan management is affected by various factors, making it a complex process. The determinants of judgement and decision-making (JDM) can be classified into three main components: individual (person), contextual

(task), and organisational (environmental). These components collectively influence the quality of judgement exercised by bank officers when assessing loan risks. Individual factors, such as the officer's knowledge, experience, and decision-making abilities, are crucial in determining their capacity to make sound judgements (Nelson & Tan, 2005). In the context of banking, these individual variables become particularly significant when officers must assess loan applications, as the decisions they make can directly impact the bank's performance.

Contextual factors, which refer to the complexity of the task at hand, also play an essential role in influencing judgement. Loan assessment is often a challenging task that requires officers to evaluate incomplete or inconsistent data (Favarel-Garrigues et al., 2007). The complexity of the tasks, combined with the high stakes involved, demands a high level of competence and diligence from bank officers (Noviandy et al., 2024). Organisational factors, such as the regulatory environment and internal policies, further complicate the judgement process. Officers must balance the requirements of their institution with external pressures from regulators and stakeholders, making judgement even more challenging (Mala & Chand, 2015). Thus, the determinants of judgement in banking loan management are multidimensional, requiring a combination of individual competency, task-specific knowledge, and an understanding of the broader organisational context.

Loan Application Risk Judgement in Banking Institutions
The growing globalisation and competition in financial markets have forced banks to become more innovative in managing loan risks. Loan application risk judgement is a critical process that bank officers must perform to avoid potential errors and minimise financial losses. The ability to make accurate judgements depends heavily on the professional competency of the bank officers and the support provided by information technology (IT) systems. IT plays a pivotal role in enabling officers to process vast amounts of data efficiently and securely, which is essential in today's fast-paced banking environment (Edunjobi & Odejide, 2024).

Moreover, the use of IT in banking strengthens internal controls by providing automated systems for monitoring loan applications and detecting potential risks. With the assistance of IT, bank officers can assess loan risks more effectively, using advanced tools to gather, analyse, and interpret data about borrowers' risk profiles (Boushnak et al., 2018). This ensures that decisions are based on accurate and up-to-date information, thereby reducing the likelihood of fraud and non-compliance with regulations. IT also enhances data security by protecting sensitive financial information from breaches, ensuring that internal controls are robust and that regulatory standards are met (Rehman et al., 2019).

In conclusion, professional competency and IT integration are both vital in banking loan management. While professional judgement remains a key component of the loan risk assessment process, the use of IT strengthens internal controls and enhances data security, making the overall process more reliable and efficient. This interplay between human judgement and technology forms the backbone of effective loan management in the modern banking sector.

Competency

Competency can be defined from various perspectives. Vazirani and Nitin (2010) describe it as a characteristic that determines how people act or think. In financial institutions, officers often face challenges in decision-making, partly due to a lack of competency (Mcmurray, 1995). Barac (2009) links competency frameworks with professional accounting skills, while Orme and Ashton (2003) argue that ethics forms the foundation of competency, encompassing social, strategic, and transcendental ethics. Competency plays a key role in enabling officers to make sound judgments.

The concept of competency has evolved since its introduction by McClelland (1973) and Lawler (1994), transitioning from human resource management to various business disciplines. Research initially focused on individuals and departments but has expanded to include organisational levels. Mirabile (1997) defines competency as a combination of expertise, skills, and abilities necessary for successful job performance, especially in human resource management. Kauffeld (2006) identifies four key competencies for self-management teams: expertise, skills, collaboration, and creating a learning environment. These competencies influence how well technological skills are applied, with social competency playing a vital role.

In a strategic context, competencies provide a competitive advantage by combining intellectual, methodological, and product capabilities (Prahalad & Hamel, 1997). Technological advances and globalisation have further expanded the definition of competencies, incorporating process capabilities that enhance organisational performance. Competency is also a critical concept in education and workforce planning (Mulder, 2001). Boyatzis (1982) connected human resource management to organisational development, showing that competencies are valuable for workforce planning, selection, training, performance management, and succession planning. The concept has been applied globally across various fields and remains an important factor in research on skills and performance (Biemans et al., 2004).

Experience also enhances competency. Reinhard et al. (2012) found that officers with more experience in judgment tasks are better able to detect fraud, leading to more accurate decision-making. This underscores the importance of competency in decision-making, with officers who possess high levels of experience demonstrating greater accuracy. Competency frameworks also enable strategic thinking and produce more structured and higher-quality decision-making (Goldman & Scott, 2016). Competency is closely tied to professional skills. Barac (2009) suggests that expertise in relevant skills is crucial for competency. Competency frameworks require specific skills such as investigative abilities, communication, and analytical skills, all of which contribute to accurate decision-making and interpersonal effectiveness.

According to the Internal Professional Practices Framework (IPPF, 2013), Internal Auditors (IAs) must possess the necessary competencies to carry out their duties, including expertise in fraud detection. Hamdan et al. (2017) found that competency positively influences IAs' contributions to fraud detection, a finding applicable to bank officers responsible for assessing loan applications. Individual variables like competency, information processing ability, decision aids, and prior experience significantly impact judgment (Bonner,

1999; Mala & Chand, 2015). Studies consistently highlight competency as the most critical factor in judgment and decision-making, with numerous researchers reinforcing its importance (Priska et al., 2021; Gardi et al., 2020; Haleem et al., 2018; Keerthy & Jacob, 2014). Thus, this study examines competency as a key individual variable.

Internal Control

Internal control is a vital approach adopted by organisations to prevent fraud and ensure the achievement of operational, reporting, and compliance objectives (COSO, 2013). Pathak (2005) describes internal control as encompassing standards, policies, rules, and procedures, providing a powerful mechanism to minimise fraud. Research has consistently shown that internal control is crucial for business operations (Koutoupis & Malisiovas, 2021; Chang et al., 2019), serving as a tool for allocating and regulating resources while reducing fraud risks. In Italy, banking regulations follow the Bank of International Settlements (BIS) supervisory framework, guiding financial institutions to develop robust internal control models (Opromolla & Maccarini, 2010).

The effectiveness of internal control depends on management adherence to established procedures (Hanif, 2015; Gamage et al., 2014). Internal control systems enhance the reliability of information and risk management, supported by Pathak (2005), who emphasises their role in supporting effective organisational operations. The focus of internal control in this study is on managing the behaviour of bank officers when assessing loan application risk. Payne (1976) highlights how individuals' ability to perform tasks is influenced by both their behaviour and environmental factors. Even with good intentions, human error or deliberate falsification of work can lead to fraud. Hence, effective internal controls are necessary to mitigate these human weaknesses.

Bank Negara Malaysia (BNM) has established guidelines for financial institutions that outline policies and processes to manage risks (BNM, n.d.-a). Strong internal controls protect resources, improve efficiency, and reduce fraud risks (Trimisiu Tunji & Siyanbola Trimisiu Tunji, 2013; Zakaria et al., 2016; Ashbaugh-Skaife & Collins, 2009). Effective internal controls help bank officers assess loan application risks accurately, ensuring the validity of customer identification and limiting operational risks (Johari et al., 2014). The effectiveness of internal controls also depends on the quality and quantity of human resources. Choi et al. (2013) found that a competent workforce enhances internal controls, ensuring proper fraud detection and risk management. Investment in human resources positively impacts internal control quality, translating into better organisational performance.

Customer Due Diligence (CDD) plays a crucial role in internal controls, requiring banks to verify customers' identities and assess risks before providing services (FATF, 2012). CDD is part of the broader Anti-Money Laundering (AML) regime and involves ongoing risk assessments (FATF, 2014). Although CDD and Know Your Customer (KYC) are often used interchangeably, CDD encompasses a broader concept that includes customer risk management (Koker, 2006). Basel Committee guidelines highlight the importance of CDD in managing customer acceptance, identification, and risk (Basel Committee on Banking Supervision, 2001). Bank officers must rigorously follow CDD processes to mitigate risks and avoid penalties for negligence (Mat-Isa et al., 2015). By complying with CDD requirements,

officers can reduce the risk of fraud and ensure that internal controls effectively support organisational risk management strategies.

Conclusion and Implication

In the digital age, the role of banking loan officers is evolving to encompass both professional competency and the imperative of data security, facilitated by advanced digital tools. The integration of information technology into the decision-making processes enhances efficiency, accuracy, and the ability to manage risk. However, while digital tools such as expert systems can streamline operations and assist in fraud detection, the human element remains crucial for interpreting data and making sound judgements.

This paper highlights that professional competency, when supported by digital tools and robust data security measures, plays a critical role in improving loan application risk judgement. Loan officers must be equipped not only with technical skills but also with a deep understanding of organisational controls, IT systems, and cybersecurity strategies. As financial institutions increasingly rely on digital platforms, the alignment of competency and technology will be key to safeguarding sensitive information, mitigating fraud risks, and maintaining trust in the banking system.

Thus, the evolving landscape calls for continuous enhancement of loan officers' competencies, coupled with the strategic use of digital tools, to ensure effective, secure, and informed loan processing decisions. This paper lays the foundation for further empirical studies on the intersection of professional expertise, IT integration, and data security within the banking sector.

This conceptual paper on "Bridging Professional Competency and Data Security: The Evolving Role of Digital Tools for Banking Loan Officers" has several limitations. Firstly, it primarily focuses on the theoretical aspects without empirical validation, highlighting the need for future studies to test the proposed frameworks and hypotheses. The research is largely confined to the banking sector, which may limit generalisability to other industries that rely on digital tools differently. Additionally, the rapid evolution of technology may quickly render some findings outdated, as the competencies required of loan officer's change.

Future research should aim to empirically validate the relationships between professional competency, data security, and digital tool usage through qualitative and quantitative methods. Expanding the scope beyond banking to other sectors could provide a broader perspective on these dynamics. Investigating the role of artificial intelligence in enhancing decision-making processes and exploring training strategies to keep loan officers' skills aligned with technological advancements are also promising areas for future inquiry. Lastly, examining the effectiveness of current data security measures and the importance of digital literacy in mitigating cyber threats could further enrich the understanding of the evolving role of banking loan officers.

The research contributes to existing knowledge by extending the understanding of how digital tools influence the decision-making processes of banking loan officers, a critical yet underexplored area in financial management literature. By situating this study within the context of increasing cybersecurity threats and the digitalisation of financial services, it

provides a framework for aligning technological advancements with human expertise to mitigate fraud and enhance operational resilience. Furthermore, the findings have practical implications for the banking industry, offering actionable insights for integrating digital tools with professional training and robust internal controls. This contextual relevance makes the research valuable for banks, regulators, and policymakers as they navigate the complexities of safeguarding sensitive information while optimising loan management in the digital age.

References
Abu-Shanab, E., & Matalqa, S. (2015). Security and Fraud Issues of E-banking. International Journal of Computer Networks and Applications, 2(4), 179-188.

ACFE. (2020). 2020-Report-to-the-Nations.

Andersson, P. (2004). Does experience matter in lending? A process-tracing study on experienced loan officers' and novices' decision behavior. Journal of Economic Psychology, 25(4), 471-492.

Apergis, N. (2024). The role of loan loss provisions in income inequality: Evidence from a sample of banking institutions. Journal of Financial Stability, 73, 101299.

Ashbaugh-Skaife, H., Collins, D. W., Kinney Jr, W. R., & LaFond, R. (2006). The Effect of Internal Control Deficiencies on Firm Risk and Cost of Equity Capital. The Accounting Review, 83(1), 217-250.

Asmah, A. E., Atuilik, W. A., & Ofori, D. (2020). Antecedents and consequences of staff related fraud in the Ghanaian banking industry. Journal of Financial Crime, 27(1), 188-201.

Atkins, B., Dou, Y., Tee, J., Ng, Y., Atkins, B., Dou, Y., Ng, J., & Tee, Y. (2015). Corruption in Bank Lending: The Role of Timely Loan Loss Provisioning. https://ink.library.smu.edu.sg/soa_research

Bandura, A. (1977). Social Learning Theory. Stanford University: General Learning Corporation.

Banna, H., Ahmad, R., & Koh, E. H. (2018). How does total quality management influence the loan quality of the bank?. Total Quality Management & Business Excellence, 29(3-4), 287-300.

Barac, K., & van Staden, M. (2009). The correlation between perceived internal audit quality and defined corporate governance soundness. African Journal of Business Management, 3(13), 946–958. http://www.academicjournals.org/AJBM

Bianchi, M. T., & Cosentino, A. (2021). The Impact of Digitalization on the Company Value: A Nonperforming Loan Management Business Application. Intellectual Capital, Smart Technologies and Digitalization: Emerging Issues and Opportunities, 251-259.

Biemans, H., Nieuwenhuis, L., Poell, R., Mulder, M., & Wesselink, R. (2004). Competence-based VET in the Netherlands: Background and pitfalls. Journal of vocational education and training, 56(4), 523-538.

Błaszczyński, J., Almeida Filho, A. T., Matuszyk, A., Szeląg, M., & Słowiński, R. (2021). Auto loan fraud detection using dominance-based rough set approach versus machine learning methods. Expert Systems with Applications, 163, 113740.

Błaszczyński, J., Almeida Filho, A. T., Matuszyk, A., Szeląg, M., & Słowiński, R. (2021). Auto loan fraud detection using dominance-based rough set approach versus machine learning methods. Expert Systems with Applications, 163, 113740.

Błaszczyński, J., Almeida Filho, A. T., Matuszyk, A., Szeląg, M., & Słowiński, R. (2021). Auto loan fraud detection using dominance-based rough set approach versus machine learning methods. Expert Systems with Applications, 163, 113740.

BNM. (2020). Promoting Monetary Stability Our Role.

Bonner, S. E. (1999). Judgment and decision-making research in accounting. Accounting Horizons, 13(4), 385.

Boushnak, E., Rageb, M. A., Ragab, A. A., & Sakr, A. M. (2018). Factors Influencing Credit Decision for Lending SMEs: A Case Study on National Bank of Egypt. OALib, 05(11), 1–17. https://doi.org/10.4236/oalib.1104996

Brown, K., & Moles, P. (2014). Credit Risk Management. http://coursewebsites.ebsglobal.net.

Carabelli, C. (2019, 1 29). Risks of Bank Loan. Retrieved from https://budgeting.thenest.com/chargeoff-mortgage-29688.html:

Carminati, M., Caron, R., Maggi, F., Epifani, I., & Zanero, S. (2015). BankSealer: A decision support system for online banking fraud analysis and investigation. computers & security, 53, 175-186.

Carminati, M., Caron, R., Maggi, F., Epifani, I., & Zanero, S. (2015). BankSealer: A decision support system for online banking fraud analysis and investigation. computers & security, 53, 175-186.

Chang, Y.-T., Chen, H., Cheng, R. K., & Chi, W. (2019). The impact of internal audit attributes on the effectiveness of internal control over operations and compliance. Journal of Contemporary Accounting & Economics, 15(1), 1–19. https://doi.org/10.1016/j.jcae.2018.11.002

Chen, L., Jia, N., Zhao, H., Kang, Y., Deng, J., & Ma, S. (2022). Refined analysis and a hierarchical multi-task learning approach for loan fraud detection. Journal of Management Science and Engineering, 7(4), 589-607.

Chen, L., Jia, N., Zhao, H., Kang, Y., Deng, J., & Ma, S. (2022). Refined analysis and a hierarchical multi-task learning approach for loan fraud detection. Journal of Management Science and Engineering, 7(4), 589-607.

Chen, L., Jia, N., Zhao, H., Kang, Y., Deng, J., & Ma, S. (2022). Refined analysis and a hierarchical multi-task learning approach for loan fraud detection. Journal of Management Science and Engineering, 7(4), 589-607.

Choi, J. H., Choi, S., Hogan, C. E., & Lee, J. (2013). The Effect of Human Resource Investment in Internal Control on the Disclosure of Internal Control Weaknesses. Auditing, 32(4), 169–199.

COSO. (2013). Internal Control — Integrated Framework. Committee of Sponsoring Organizations of the Treadway Commission.

CPE. (2021, July 07). AccountingTools ACCOUNTING CPE COURSES & BOOKS. Retrieved from accountingtools.com : https://www.accountingtools.com/articles/2017/5/13/loan

Dhillon, G., Ahmad, R., Rahman, A., & Ng, Y. M. (2013). The Viability of Enforcement Mechanisms under Money Laundering and Anti-Terrorism Offences in Malaysia. Journal of Money Laundering Control, 16(2), 171–192.

Dorfleitner, G., & Jahnes, H. (2014). What factors drive personal loan fraud? Evidence from Germany. Review of Managerial Science, 8, 89-119.

Edunjobi, T. E., & Odejide, O. A. (2024). Theoretical frameworks in AI for credit risk assessment: Towards banking efficiency and accuracy. International Journal of Scientific Research Updates 2024, 7(01), 092-102.

Edwards, W. (1961). Behavioral Decision Theory. Annual Review of Psychology, 12(1), 473-498.

Erum, N., Yousaf, A., Said, J., Musa, K., & Khan, S. (2024). Examining the impact of corruption and other macro-economic variables on capital accumulation in Pakistan. Management & Accounting Review (MAR), 23(2), 115-142.

Eweoya, I. O., Adebiyi, A. A., Azeta, A. A., & Azeta, A. E. (2019). Fraud prediction in bank loan administration using decision tree. Journal of Physics: Conference Series, 1299(1), 012037. https://doi.org/10.1088/1742-6596/1299/1/012037

FATF. (2014). The Banking Sector - Guidance for a Risk-Based Approach. FATF website. (n.d.). Financial Action Task Force (FATF).

FATF. (2014). The Banking Sector - Guidance for a Risk-Based Approach. FATF website. (n.d.). Financial Action Task Force (FATF).

Favarel-Garrigues, G., Godefroy, T., & Lascoumes, P. (2007). Sentinels in the Banking Industry: Private Actors and the Fight against Money Laundering in France. British Journal of Criminology, 48(1), 1–19.

Favarel-Garrigues, G., Godefroy, T., & Lascoumes, P. (2011). Reluctant Partners? Banks in the Fight Against Money Laundering and Terrorism Financing in France. Security Dialogue, 42(2), 179–196.

Fukuyama, H., Matousek, R., & Tzeremes, N. G. (2024). A unified framework for nonperforming loan modeling in bank production: An application of data envelopment analysis. Omega, 126, 103063.

Gamage, C. T., & Lock, K. L., & Fernando, A. A. J. (2014). Effectiveness of internal control system in state commercial banks in Sri Lanka. International Journal of Scientific Research and Innovative Technology, 1(5), 25–44. https://www.ijsrit.com/uploaded_all_files/1633729483_o2.pdf

Gardi, B., Ali, R., Al-Kake, F., & Majeed Hamawandy, N. (2020). The Effect of Capital Competence on the Profitability of Development and Investment Banks in Turkey. www.solidstatetechnology.us

Goedde-Menke, M., & Ingermann, P. H. (2024). Loan officer specialization and credit defaults. Journal of Banking & Finance, 161, 107077.

Goldman, E., & Scott, A. R. (2016). Competency models for assessing strategic thinking. Journal of Strategy and Management, 9(3), 258–280. https://doi.org/10.1108/JSMA-07-2015-0059

Gottschalk, P. (2014). Characteristics of financial crime investigation reports by fraud examiners. Journal of Investment Compliance, 15(4), 57–66. https://doi.org/10.1108/JOIC-04-2014-0014

Haleem, A., Low Lock Teng, K., & Abdul Rahman, T. (2018). International Journal of Economics and Financial Issues Impact of User Competency on Accounting Information System Success: Banking Sectors in Sri Lanka. International Journal of Economics and Financial Issues, 8(6), 167–175. https://doi.org/10.32479/ijefi.7212

Hamdan, S. L., Jaffar, N., Ab Razak, R., & Salleh, N. M. Z. N. (2017). The Effects of Internal Auditor's Competency and Whistleblowing Mechanism on Fraud Detection in Malaysia.

Hanif, M. (2015). The Impact of Internal Control Systems On Financial Performance of Banks : A Case of Banks in Pakistan Department of Management Sciences. Department of Management Sciences, 7(5), 1–29.

Härle, P., Havas, A., Kremer, A., Rona, D., & Samandari, H. (2015). The future of bank risk management McKinsey Working Papers on Risk.

Haron, S., & Shanmugam, B. (1994). Lending to small business in Malaysia. Journal of Small Business Management, 32(4), 88.

Heyrani, F., Vakilifard, H., Banimahd, B., & Roudposhti, F. R. (2015). The Effect of Auditors ' Social Traits on Their Judgments to Resolve the Conflicts between the Auditor and the Management Based on Selected Traits : Over-confidence and Machiavellianism Personality. Journal of Applied Environmental and Biological Sciences, 5, 186–201.

Hinterseer, K. (2001). The Wolfsberg Anti-Money Laundering Principles. Journal of Money Laundering Control, 5(1), 25-41.

Jin, J., Li, N., Liu, S., & Nainar, S. K. (2023). Cyber attacks, discretionary loan loss provisions, and banks' earnings management. Finance Research Letters, 54, 103705.

Jin, J., Li, N., Liu, S., & Nainar, S. K. (2023). Cyber attacks, discretionary loan loss provisions, and banks' earnings management. Finance Research Letters, 54, 103705.

Johari, R. J., Mohd-Sanusi, Z., Mat-Isa, Y., & Ghazali, A. W. (2014). Comparative Judgment of Novice and Expert on Internal Control Tasks: Assessment on Work Effort and Ethical Orientation. Procedia - Social and Behavioral Sciences, 145(August), 352–360.

Johnston, R. B., & Abbott, J. (2005). Placing Bankers in the Front Line. Journal of Money Laundering Control, 8(3), 215–219.

Kalimoldayev, A. M., Mazakova, A. T., Burgegulov, A. D., Sametova, A. A., & Mukhayev, D. K. (2024). Application of Digital Technologies for Ranking Loan Borrowers. In Ecological Footprint of the Modern Economy and the Ways to Reduce It: The Role of Leading Technologies and Responsible Innovations (pp. 105-109). Cham: Springer Nature Switzerland.

Kauffeld, S. (2006). Self-directed work groups and team competence. Journal of occupational and organizational psychology, 79(1), 1-21.

Keerthy, T. & Jacob, N. A. (2014). Competency Assessment of Bank Employees in India. International Journal of Organizational Behaviour and Management Perspectives, 3(3), 1112–1116.

Kelley, H. H. (1967). Attribution Theory in Social Psychology. In Orpen, C. (1980), the Relationship between Expected Job Performance and Causal Attributions of Past Success or Failure. The Journal of Social Psychology, 112(1), 151–152.

Koonce, L., Mongold, C., Quaid, L., & Winchel, J. (2024). Judgments about the Quality of Loans and Loan Originators under Expected versus Incurred Loss Accounting. Available at SSRN 4099729.

Koutoupis, A. G., & Malisiovas, T. (2023). The effects of the internal control system on the risk, profitability, and compliance of the US banking sector: A quantitative approach. International Journal of Finance & Economics, 28(2), 1638-1652.

KPMG. (2019). Gl obal Banki ng Fraud Survey The multi-faceted threat of fraud: Are banks up to the challenge?

Lawler III, E. E. (1994). From job-based to competency-based organizations. Journal of organizational behavior, 15(1), 3-15.

Lipshitz, R., & Shulimovitz, N. (2007). Intuition and emotion in bank loan officers' credit decisions. Journal of Cognitive Engineering and Decision Making, 1(2), 212-233.

Lummer, S. L., & McConnell, J. J. (1989). Further evidence on the bank lending process and the capital-market response to bank loan agreements. Journal of financial economics, 25(1), 99-122.

Mala, R., & Chand, P. (2015). Judgment and decision-making research in auditing and accounting: future research implications of person, task, and environment perspective. Accounting Perspectives, 14(1), 1-50.
Mala, R., & Chand, P. (2015). Judgment and decision-making research in auditing and accounting: future research implications of person, task, and environment perspective. Accounting Perspectives, 14(1), 1-50.

Masciandaro, D. (1999). Money laundering: the economics of regulation. European Journal of Law and Economics, 7, 225-240.

Mason, S., & Bohm, N. (2017). Banking and fraud. Computer law & security review, 33(2), 237-241.

Masters, J. L. (2008). Fraud and money laundering: the evolving criminalization of corporate non-compliance. Journal of Money Laundering Control, 11(2), 103–122. https://doi.org/10.1108/13685200810867447

Mat-Isa, Y., Mohd-Sanusi, Z., Haniff, M. N., & Barnes, P. A. (2015). Money Laundering Risk: From the Bankers' and Regulators Perspectives. Procedia Economics and Finance, 28(April), 7–13.

McClelland, D. C. (1973). Testing for competence rather than for" intelligence.". American psychologist, 28(1), 1.

McClelland, D. C., & Boyatzis, R. E. (1982). Leadership motive pattern and long-term success in management. Journal of Applied psychology, 67(6), 737.

Mcmurray, G. (1995). THE PRACTICAL COMPLIANCE OFFICER : TECHNICALITY.

Mirabile, R. J. (1997). Everything you wanted to know about competency modeling. Training & development, 51(8), 73-78.

Morekwa Nyamongo, E., & Temesgen, K. (2013). The effect of governance on performance of commercial banks in Kenya: a panel study. Corporate Governance: The international journal of business in society, 13(3), 236-248.

Mosier, K. L., & Fischer, U. (2010). The role of affect in naturalistic decision making. Journal of Cognitive Engineering and Decision Making, 4(3), 240-255.

Mulder, M. (1999). Competentie ontwikkeling in organisaties.[Competence development in organizations]. Assen: Van Goram.

Nelson, M., & Tan, H. T. (2005). Judgment and decision making research in auditing: A task, person, and interpersonal interaction perspective. Auditing: A journal of practice & theory, 24(s-1), 41-71.

Nobanee, H., & Ellili, N. (2018). Anti-money laundering disclosures and banks' performance. Journal of Financial Crime, 25(1), 95-108.

Norman, S. M., Avolio, B. J., & Luthans, F. (2010). The impact of positivity and transparency on trust in leaders and their perceived effectiveness. The leadership quarterly, 21(3), 350-364.

Noviandy, T. R., Idroes, G. M., & Hardi, I. (2024). Enhancing loan approval decision-making: an interpretable machine learning approach using LightGBM for digital economy development. Malaysian Journal of Computing (MJOC), 9(1), 1734-1745.

Ogunmokun, O. C., Mafimisebi, O., & Obembe, D. (2024). Bank lending behaviour and small enterprise debt financing. Journal of Entrepreneurship in Emerging Economies, 16(3), 675-697.

Opromolla, G., & Maccarini, M. (2010). The control system in the Italian banking sector: Recent changes in the application of Legislative Decree No. 231 of June 8, 2001. Journal of Investment Compliance, 11(2), 16-22.

Orme, G., & Ashton, C. (2003). Ethics–a foundation competency. Industrial and Commercial Training, 35(5), 184-190.

Pancotto, L., Gwilym, O., & Williams, J. (2024). The evolution and determinants of the non-performing loan burden in Italian banking. Pacific-Basin Finance Journal, 84, 102306.

Pathak, J. (2005). Risk management, internal controls and organizational vulnerabilities. Managerial Auditing Journal, 20(6), 569–577. https://doi.org/10.1108/02686900510606065

Payne, J. W. (1976). Task Complexity and Contingent Processing in Decision Making: An Information Search and Protocol Analysis. Organizational Behavior and Human Performance, 16(2), 366–387.

Prahalad, C. K., & Hamel, G. (1997). 17 The Core Competence of the. Resources, Firms, and Strategies: A Reader in the Resource-based Perspective, 235.

Priska, S., Lestari, P., & Guritno, A. (2021). Factors Affecting the Performance of Islamic Banking Employees (Vol. 1). www.ojk.go.id

PYMNTS. (2020). Deep Dive: Why Teamwork Makes the Dream Work When It Comes to Fraud Prevention. Retrieved 21st June 2021, from https://www.pymnts.com/buy-now-pay-later/2020/new-report-the-role-of-flexible-payment-options-in-bringing-customers-back-into-stores/

Rahman, R. A., & Anwar, I. S. K. (2014). Effectiveness of Fraud Prevention and Detection Techniques in Malaysian Islamic Banks. Procedia - Social and Behavioral Sciences, 145, 97–102. https://doi.org/10.1016/j.sbspro.2014.06.015

Rehman, Z. U., Muhammad, N., Sarwar, B., & Raz, M. A. (2019). Impact of risk management strategies on the credit risk faced by commercial banks of Balochistan. Financial Innovation, 5(1). https://doi.org/10.1186/s40854-019-0159-8

Reinhard, M. A., Dahm, J., & Scharmach, M. (2012). Perceived Experience and Police Officers' Ability to Detect Deception. Policing an International Journal of Police Strategies & Management, 35(4), 822–834.

Ross, S., & Hannan, M. (2007). Money Laundering Regulation and Risk-Based Decision-Making. Journal of Money Laundering Control, 10(1), 106–115.

Sakawa, H., & Watanabel, N. (2022). Accounting frauds and main-bank monitoring in Japanese corporations. Journal of business ethics, 180(2), 605-621.

Sanusi, Z. M., Rameli, M. N. F., & Isa, Y. M. (2015). Fraud schemes in the banking institutions: prevention measures to avoid severe financial loss. Procedia Economics and Finance, 28, 107-113.

Sledgianowski, D., Gomaa, M., & Tan, C. (2017). Toward integration of Big Data, technology and information systems competencies into the accounting curriculum. Journal of Accounting Education, 38, 81-93.

Subbotina, N. (2009). Challenges that Russian Banks Face Implementing the AML Regulations. Journal of Money Laundering Control, 12(1), 19–32.

TARIQ, Q. (2021, April 24). Bank scams increasingly targeting mobile users, says cybersecurity firm. Retrieved from thestar.com.my: https://www.thestar.com.my/tech/tech-news/2021/04/27/bank-scams-increasingly-targeting-mobile-users-says-cybersecurity-firm (accessed 10 September 2021)

Trotman, K. T. (1998). Audit judgment research—Issues addressed, research methods and future directions. Accounting & Finance, 38(2), 115-156.

Usman Kemal, M. (2014). Anti-money laundering regulations and its effectiveness. Journal of Money Laundering Control, 17(4), 416-427.

Wang, H., Guo, C., & Cheng, S. (2019). LoC—A new financial loan management system based on smart contracts. Future Generation Computer Systems, 100, 648-655.

Wei, X., Gotoh, J. Y., & Uryasev, S. (2018). Peer-to-peer lending: Classification in the loan application process. Risks, 6(4). https://doi.org/10.3390/risks6040129

Zakaria, K. M., Nawawi, A., & Salin, A. S. A. P. (2016). Internal controls and fraud – empirical evidence from oil and gas company. Journal of Financial Crime, 23(4), 1154–1168. https://doi.org/10.1108/JFC-04-2016-0021

Zhan, Q., & Yin, H. (2018). A loan application fraud detection method based on knowledge graph and neural network. ACM International Conference Proceeding Series, Part F137692, 111–115. https://doi.org/10.1145/3194206.3194208

Zhao, S., Huang, Y., Chen, L., Wang, C., Li, S., Chen, L., & Pan, G. (2023, June). Loan fraud users detection in online lending leveraging multiple data views. In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 37, No. 4, pp. 5428-5436).