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Original Research Article

AI-Driven Customization in Financial Services: Implications for Social Innovation in Nepal

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Abstract
The study examines the association and influence of Artificial intelligence (AI) adoption and social innovation on decision-making within the Nepalese banking sector. A descriptive and causal-comparative research design is employed in the study. With a purposive sampling design, the study used 230 respondents from commercial banks in Nepal. The study findings show that AI technologies ($\beta = 0.205$) and social innovation ($\beta = 0.395$) significantly contribute to decision-making ($|p < 0.05|$). The study scrutinizes specific approaches for fostering social innovation by implementing AI-driven decision-making. Findings revealed meaningful associations between AI, social innovation, and decision-making, emphasizing the interconnected nature of these elements. The study identifies actionable strategies for leveraging AI to promote social innovation. The research implications extend to strategic management, urging financial institutions to integrate AI technologies strategically, aligning technological advancements with societal needs, and fostering a holistic approach to responsible AI adoption. This study contributes valuable insights to the evolving discourse on AI in financial services, providing a nuanced understanding of its implications for decision-making and social innovation within the unique context of Nepalese commercial banks.

Introduction
Artificial intelligence (AI) is one example of how technology is evolving so quickly that it is becoming a disruptive influence in many global businesses, including banking (Butenko, 2018). There are ramifications for many industries since AI is widely acknowledged to have the ability to transform decision-making processes, improve customer service, and increase company efficiency (Konigstorfer & Thalmann, 2020). Although artificial intelligence (AI) is widely used in backend (server-side) services like credit rating and stock prediction, Nepalese commercial banks have not thoroughly investigated how AI may affect customer engagement and decision-making procedures (Casu et al., 2016; Dahal et al., 2020; Navale et al., 2016). The adoption and effects of artificial intelligence (AI) in Nepalese commercial banks are this study's main subjects, highlighting the technology's role in decision-making and ability to spur social innovation.

The banking industry confronts issues due to artificial intelligence's

(AI) potentially revolutionary influence on various facets of everyday life, as demonstrated by the significant investments and growing adoption of AI in the US and China (Kaya et al., 2019). Potential barriers to the broad use of AI include data protection regulations and the highly regulated banking industry. Notwithstanding these obstacles, the substantial impact of AI on bank profitability cannot be understated, particularly in a setting where data-driven financial services providers, like FinTech start-ups and significant tech companies upending established banking models, are becoming more and more competitive in the banking industry (Ghimire et al., 2021; Malik, 2014; Mohammed, 2021). What specific areas of decision-making in Nepalese commercial banks stand to benefit the most from artificial intelligence (AI), and how does the degree of AI integration affect social innovation and how employees in the banking industry make decisions? What suggestions may be made to Nepal's regulators, lawmakers, and commercial banks to create a favorable atmosphere for AI-driven decision-making and social innovation in the banking sector? This is a significant question for strategists and the present financial market.

Conventional decision-making methods in Nepalese commercial banks might not be sufficient to navigate the intricate and ever-changing business environment. This could result in inefficiencies that cause mistakes, delays, and less-than-ideal choices, ultimately affecting the bank's overall performance (Dahal 2021; Kumar et al., 2017). The promise of artificial intelligence (AI) in processing large volumes of data, producing insights, and improving decision-making accuracy may not be entirely realized by Nepalese commercial banks due to a lack of adoption and integration of AI technology in decision-making processes.

Furthermore, there is a shortage of knowledge and research on how AI deployment in Nepalese commercial banks might support social innovation. Because of this knowledge gap, banks cannot effectively use AI's potential to address social issues, advance inclusive development, and offer financial services focused on their customers' needs. The research focuses on fostering social innovation as a crucial element of growth in the banking industry in Nepal. It establishes an environment that makes it easier for banks to effectively apply AI technology in their decision-making processes.

Following specific objectives bound this study to the future direction.

1. To explore the relationship and effect of adopting AI technologies and social innovation, assessing their collective impact on the decision-making processes of employees within Nepalese commercial banks.
2. To analyze specific approaches to foster social innovation through the implementation of AI-driven decision-making in the context of the banking sector in Nepal.

The knowledge gap regarding using artificial intelligence (AI) in decision-making processes inside Nepalese commercial banks must be filled, and this study is essential to doing so. It examines the possible advantages and difficulties of using AI, concentrating on the broader effects of social innovation in the banking industry. The study explores how AI may address social issues, promote inclusive growth, improve customer-centric banking services, and improve operational efficiency. The results help Nepalese commercial banks identify areas where their decision-making has to be significantly improved. Still, they also offer valuable suggestions for legislators and regulators looking to foster a supportive climate. The research promotes ethical and efficient AI applications by addressing infrastructure, data protection, legal frameworks, and talent development issues. It benefits the academic community by broadening the body of knowledge on the application of AI in the banking sector, particularly in developing nations like Nepal. This provides insightful information for subsequent studies and comparative assessments. In the end, this research can stimulate constructive transformation, improve operational effectiveness, encourage equitable development, and support long-term expansion in Nepalese commercial banks and the banking sector as a whole.

The research is divided into five sections to assess the issue thoroughly. The Introduction summarises the study's history, problem statement, aims, and reasoning. The Literature Review section examines theoretical and empirical issues, particularly on frameworks and hypothesis generation. Research Methodology describes the strategies used, including design, population, sample, data sources, and collecting methods. The result and discussion present the findings in tables and visualizations, including descriptive data and analytical remarks. The Conclusion section summarises the critical findings and provides conclusions. The References section compiles all referenced sources into a standardized structure, maintaining academic integrity throughout the study.

Literature Review

The study of Al-Araj et al. (2022) highlights how AI is relevant to all banking activities and how prevalent it is in contemporary business contexts. According to scholars like Ali Karam and Sleimi (2018), and Rai et al. (2023), there is a positive link and a critical role for consumer trust as a mediator between the quality of E-banking services and customer happiness. Investigating Indian investors' knowledge and perceptions of robo-advisors, Bhatia et al. (2021) highlight aspects such as data security, cost-effectiveness, and trust. A thorough review of AI applications in customer-facing financial services is given by Hentzen et al. (2022), who also underscore the necessity for an empirical study on consumer behavior and regulatory issues by classifying research themes. The transformational impact of AI in financial services is the main topic of Biallas and O'Neill (2020), who also stress the importance of governance, customer responsibility, and ethical issues. With a focus on the many areas of research, Pau et al.(1990) assessment provides insights into the landscape of AI applications in banking, finance, and insurance. The guest post by Mogaji et al. (2022) delves into the application of AI in financial services marketing, highlighting the responsibility of financial service providers for AI-enabled technologies and addressing ethical, prejudice, and regulatory issues.

Suresh and Rani (2020) noticed emerging trends in AI technology, such as voice-assisted banking, anti-money laundering practices, and customer service. Kumar et al. (2021) studied the impact of AI on the operation of Automated Teller Machines (ATMs) and customer happiness. Their findings indicate that although consumers are typically happy, efficient administration of ATMs is essential. Rahman et al. (2021) investigate the significance and difficulties of adopting artificial intelligence (AI) in Malaysian banking, determining the variables impacting customers' propensity to embrace AI. Positive opinions towards AI adoption and its potential advantages are revealed in Rashmi and Nirmal's (2021) study, which focuses on the use and effect of AI in banking procedures.

Regarding the use of AI in the Lebanese banking industry, Boustani (2022) finds that while it can improve transaction quality, it cannot replace human contact. Fernandez (2019) and Karki et al. (2023) focus on the possible ramifications for the financial system and the use of AI technologies in the financial services industry, highlighting their advantages. Kruse et al.(2019) examine the difficulties in implementing AI in the financial services industry, underscoring the significance of process competencies and role models. The influence of AI on the banking sector is examined by Mehrotra (2019), who highlights the necessity of striking a balance between automation and human interaction. The study by Bhatia et al. (2021) looks at how aware Indian investors are of robo-advisory services and what kind of view they have of them, and it reveals aspects that affect investor perception. In their literature evaluation, Hentzen et al. (2022) emphasize the need for more significant empirical research and comprehensive theories in the context of artificial intelligence in customer-facing financial services.

The revolutionary power of AI in emerging markets is emphasized by Biallas and O'Neill (2020), who address issues such as high prices and client identification. Financial inclusion depends on infrastructure investment, competitive dynamics, and responsible AI deployment. A comprehensive survey of real-world AI applications is given by Pau et al. (1990), who offer insights on 250 AI initiatives across several financial domains. The incorporation of AI into financial services marketing is examined by Mogaji et al. (2022), who highlight the regulatory obstacles and customized consumer profiles. In the analysis of AI's impact on financial services, Xie (2019) outlines advances and discusses barriers to ethical AI deployment. To improve justice and accessibility, Lee (2020) champions a legislative framework governing AI in financial services. Analysis of AI implications on the banking industry, Mahalakshmi et al. (2022) emphasize these technologies' transformational and automation advantages. Ia and Miglionico (2019) examine the potential benefits of AI and ML in the financial services industry, focusing on process, product, and risk management improvements.

In discussing operational excellence, AI, and lean principles in the financial services industry, Boute et al. (2022) offer ideas for digital, autonomous, and intelligent operations. Mogaji et al. (2022) discussed the difficulties associated with AI-driven digital marketing, focusing on moral issues and the need for human interaction in the consumer experience. The analysis of AI perspectives in the banking industry by Costa et al. (2022) revealed differing opinions on the operational and strategic implications. In their investigation of the revolutionary effects of AI on financial services, Kaswan et al. (2023) emphasized the necessity of security protocols and safeguards.

Rahman et al. (2023) analysis of the use of AI in Malaysian banking offers insights into fraud detection, obstacles, and variables affecting customer intention. In this systematic review, Fares et al. (2023) added industry expertise by classifying AI in banking research into three areas: strategy, process, and customer. Nguyen et al. (2023) provided insights into the revolutionary nature of big data, AI, and ML in financial technology, demonstrating their widespread effect.

The use of AI in e-commerce, company management, and finance is examined by Pallathadka et al. (2023), who highlight the advantages of operational effectiveness and consumer experience. Al-Araj et al. (2022) examined how AI has affected Jordanian banks' accounting information systems, emphasizing how AI may completely change business models. In their discussion of the consumer viewpoint on AI adoption in Asian nations, Noreen et al. (2023) found essential correlations between awareness, attitude, and intention to embrace AI in the banking industry. The following paradigm recognizes the difficulties in implementing AI, such as legal restrictions, moral dilemmas, and balancing technical advancement and customer-focused strategies. The research framework aims to provide a nuanced understanding of the implications of artificial intelligence (AI) on commercial banks' decision-making processes by synthesizing insights from various studies. This will offer valuable perspectives for strategic planning, operational enhancement, and responsible AI adoption in Nepal's financial sector.

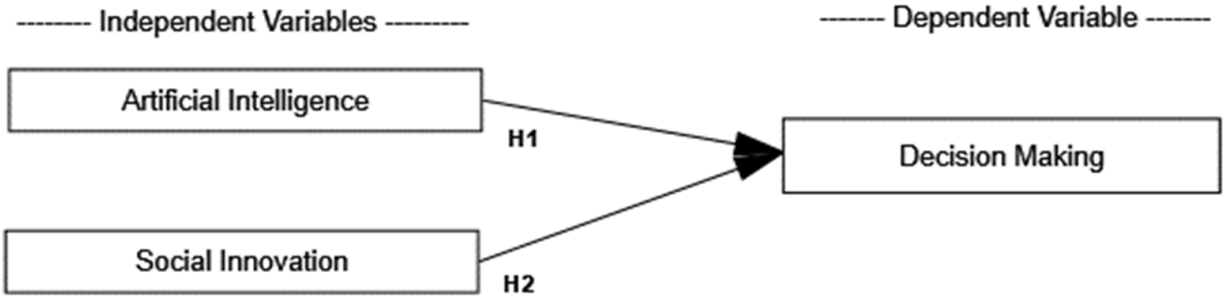

Figure 1: *Research Framework*

The study is based on the following alternative hypothesis:

H1: Artificial intelligence and the decision-making process of commercial bank workers are positively correlated.

H2: Employee decision-making at commercial banks has a favorable and substantial association with social innovation.

Methodology

The study used a descriptive and causal-comparative research approach to examine the correlations between the investigated variables. The study ascertained the quantity and kind of cause-and-effect connections between the variables using causal research, sometimes referred to as explanatory research. Research topics, particular hypotheses to investigate, and well-defined structures characterize descriptive and causal designs. This methodology enables a thorough comprehension of the study issue by amalgamating quantitative data with qualitative thoughts.

The study's sample comprises 230 individuals, comprising workers from several tiers of Nepalese commercial banks. A combination of purposive and random sampling approaches can guarantee representation across various banks, departments, and job categories. When adopting AI and decision-making, the sample should try to represent a wide range of viewpoints and experiences. Although the study is aware of the drawbacks of purposive sampling, including the possibility of selection bias, it feels that the approach selected is in line with the goals of the study and the requirement for in-depth, contextually rich participant insights that are directly related to the research questions.

The structured questionnaire aimed to get quantitative information from the participants. Multiple-choice, Likert-scale, and demographic items were included in the questionnaire. Depending on what was practical and accessible for participants, the questionnaire was either online or in person. Fourteen Likert-type scale items

adapted from Hameed's (2022) were used in the study. In addition, three items relating to the respondents' demographics such as gender, age, and educational background, were utilized in the study. In the case of the study of each variable, respondents were asked to choose the relevant group. Social innovation and artificial intelligence (AI) are the independent variables covered in Section B. In addition to expressing agreement or disagreement with statements on the impact of AI on unemployment and faith in the AI scientific community, participants are invited to provide their thoughts on social entrepreneurship, the social economy, and the impact of design thinking on banking policy. Responses are collected using the Likert scale from "Strongly Disagree" to "Strongly Agree." The respondents' insights on the decision-making practices of Nepalese banks concerning technology adoption, data utilization, optimism in problem-solving, consideration of alternatives, and timeliness in decision-making are centered in Section C, which focuses on the dependent variable of decision-making. The study protects participant identity and confidentiality while abiding by ethical standards. Participants gave informed consent, and their rights and privacy were upheld at every study stage.

Usable questionnaires were obtained, and their data were appropriately input into SPSS version 26 for Windows, the statistical tool for social research. Additionally, Microsoft Office Excel was utilized for data processing. Regression analysis, correlation analysis, and descriptive statistics were among the suitable statistical methods used to examine the quantitative data that had been gathered. Regression analysis examines the relationship between multiple independent variables and a single dependent variable. Statistical tools used to arrive at the findings included validity and reliability, Cronbach's Alpha, descriptive statistics such as percentage, mean, mean differences, standard deviation, coefficient of variation, and bivariate coefficient of correlations. The following regression model serves as the study's foundation:

$$\text{Decision Making } (Y) = a + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \ldots\ldots (i)$$

Where,
X_1= Artificial Intelligence
X_2= Social Innovation
β_1, & β_2, = Regression coefficients of X_1 and X_2
ε = Error term capturing another explanatory variable not explicitly included in the model.

Demographic Profile of the Respondents

Table 1 presents a comprehensive demographic description of the research participants, including key attributes such as gender, age distribution, and educational background.

Table 1: *Study Demographics*

Groups	Frequency	Percentage
Gender		
Male	129	56.1
Female	101	43.9
Total	230	100.0
Age		
Below 25 years	53	23.0
26 to 40 years	47	20.4
41 to 50 years	67	29.1
Above 51 years	63	27.4
Total	230	100.0
Academic Qualification		
Plus Two Completed	38	16.5
Bachelor	33	14.3
Master	147	63.9

Groups	Frequency	Percentage
MPhil and PhD	12	5.2
Total	230	100.0

Reliability and Validity of the Instrument

The paper thoroughly examines the notions of validity and reliability, emphasizing their importance in ensuring the legitimacy and integrity of the data obtained. The test focuses on the research instrument's accuracy in measuring the desired components (validity) and the consistency and dependability of the results across time.

Table 2: *Reliability and Validity Test Result*

Variables	Items	Cronbach Alpha
Artificial Intelligence	5	.833
Social Innovation	4	.734
Decision Making	5	.808
Total	14	.891

Table 2 shows the results of the reliability and validity tests for the essential variables in the study. The Cronbach's Alpha coefficient for the variable Artificial Intelligence, which consists of five items, is 0.833, suggesting a high level of internal consistency. Similarly, the four-item variable Social Innovation has a Cronbach's Alpha of 0.734, indicating a high level of reliability. The Cronbach's Alpha for Decision Making, which consists of five items, is 0.808, showing good internal consistency. When all factors are included, the complete scale of 14 items has a remarkable overall dependability, with a Cronbach's Alpha of.891. These findings demonstrate the robustness and consistency of our assessment techniques for evaluating Artificial Intelligence, Social Innovation, and Decision Making in the context of AI-driven Personalisation in Financial Services.

Presentation and Analysis

This section summarises the research findings on AI-driven customization in financial services, examining the implications for social innovation in Nepal with a significant focus on the dependent variable, decision-making. The findings are painstakingly provided as tables, which include descriptive statistics, correlation data, and regression analysis results.

This part presents a complete study of the data using descriptive statistics, offering a quantitative panorama in the study of AI-driven customization in financial services.

Table 3: *Descriptive Statistics*

	N	Minimum	Maximum	Mean	SD
Artificial Intelligence	230	2.00	6.60	4.70	0.81
Social Innovation	230	2.75	7.00	4.96	0.75
Decision-Making	230	3.00	7.00	5.01	0.66

Table 3 shows descriptive statistics for the essential factors in the investigation. The mean score for the variable Artificial Intelligence, which ranges from 2.00 to 6.60, is 4.70, with a standard deviation of 0.81. The mean Social Innovation score ranges from 2.75 to 7.00, is 4.96 with a standard deviation of 0.75. For the variable Decision-Making, with scores ranging from 3.00 to 7.00, the mean is 5.01, and the standard deviation is 0.66. These descriptive statistics provide a comprehensive overview of the central tendency and variability within the responses for Artificial Intelligence, Social Innovation, and Decision-Making, providing valuable insights into the distribution of participant perspectives in the study of AI-driven Personalisation in Financial Services.

This section examines the interrelationships between variables using correlation analysis, revealing the intricate connections within the study. Correlation analysis is critical in demonstrating the interconnected dynamics of variables, providing crucial insights into the relationships that significantly impact the landscape of

AI-driven personalization in finance.

Table 4: *Correlations Result*

		AI	SI	DM
Pearson Correlation	Artificial Intelligence	1		
	Social Innovation	.622**	1	
	Decision-Making	.531**	.605**	1

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

Table 4 shows the correlations between the essential factors in the investigation. Pearson Correlation coefficients measure the degree and direction of correlations between Artificial Intelligence (AI), Social Innovation (SI), and Decision-Making (DM). The correlation coefficient between AI and SI is.622**, indicating a positive and statistically significant link. Similarly, the correlation between AI and DM is.531**, while the correlation between SI and DM is 605, both positive and statistically significant. The notation ** indicates that the correlation is essential at the 0.01 level (2-tailed), emphasizing the strength and dependability of the observed associations. These correlation findings help to further our knowledge of how AI, Social Innovation, and Decision-Making interact in the context of AI-driven Personalisation in Financial Services.

In this part, the study utilizes regression analysis to analyze the association between study variables, presenting a nuanced view of the factors impacting decision-making in the context of AI-driven customization within Nepal's socioeconomic landscape.

Table 5: *Regression Results*

Factors	Beta	t	Sig.
(Constant)	2.089	8.798	.000
Artificial Intelligence	.205	3.852	.000
Social Innovation	.395	6.863	.000
R = .637	R Square = .405	F Value = 77.36	.000

Dependent Variable: Decision Making

Table 5 shows the regression findings for the elements that influence decision-making in the context of AI-driven personalization in financial services. The Beta coefficients represent the degree and direction of the association between each independent and dependent variable. The constant term is 2.089, and it is statistically significant (p = .000). The Beta for Artificial Intelligence is 205, with a t-value of 3.852, showing a substantial positive effect on decision-making (p = .000). Social innovation has a beta of.395 and a t-value of 6.863, indicating a significant favorable influence on decision-making (p = .000). The total model has a high level of explanatory power, as evidenced by a R-value of .637, a R Square value of.405, and a substantial F value of 77.36 (p = .000). These findings shed light on the individual and collective contributions of artificial intelligence and social innovation to decision-making in the financial services sector.

The findings are relevant for strategic management in the financial services industry. The positive and statistically significant correlations between Artificial Intelligence (AI), Social Innovation (SI), and Decision-Making (DM) indicate that organizations that strategically incorporate AI and foster a culture of social innovation are more likely to improve their decision-making processes. Organizations that proactively invest in and incorporate AI tools into their operations may gain a competitive edge by making more efficient, data-driven decisions. Financial institutions proactively integrating their decision-making processes with social innovation principles are more likely to meet community needs, promote beneficial societal benefits, and improve long-term viability. Organizations may enhance decision-making results by strategically using AI technology and cultivating a culture of social innovation as part of their overall strategic management activities.

Discussions

This study's findings are consistent with and complement other research efforts that contribute to a complete knowledge of the multidimensional influence of Artificial Intelligence (AI) in transforming financial services. Al-Araj et al.'s (2022) examination of AI in current corporate contexts is consistent with the focus on AI-driven customization in Financial Services, emphasizing AI's pervasiveness across banking operations. Furthermore, Ali Karam and Sleimi's (2018) study, which found a favorable relationship between E-banking service quality and customer happiness, is consistent with the analysis of factors impacting decision-making, in which AI and social innovation emerge as key contributors. Bhatia et al. (2021) analysis of Indian investors' knowledge and perceptions of robo-advisors, focusing on criteria such as cost-effectiveness, trust, and data security, is similar to the inquiry into AI's effects on decision-making in the financial services industry.

Furthermore, Hentzen et al. (2022) thorough survey of AI applications in customer-facing financial services and categorizing study themes is consistent with the investigation into the relationships between Artificial Intelligence, Social Innovation, and Decision-Making. Biallas and O'Neill (2020) work emphasizes ethical issues, governance, and consumer responsibility, consistent with the more significant themes in the study about the proper integration of AI in financial services. Mogaji et al. (2022) investigation of the integration of AI in financial services marketing, which addresses ethical concerns, biases, and legal hurdles, is similar to our assessment of these issues in the context of decision-making. The second collection of research strengthens and expands upon these ideas. Suresh and Rani (2020) recognition of new AI trends, such as customer assistance and voice-assisted banking, is consistent with the changing environment of AI-driven Personalisation in Financial Services. Rahman et al. (2021) investigation of the significance and limitations of AI adoption in Malaysian banking is consistent with the analysis of the elements influencing customers' intent to use AI. These diverse perspectives contribute to a more nuanced understanding of AI's transformative role in financial services, ranging from e-banking and robo-advisors to customer-facing interactions, marketing strategies, and overall financial institution strategic management. These findings emphasize the importance of responsible AI adoption, ethical concerns, and strategic alignment to fully realize AI's promise in defining the future of financial services.

Conclusion and Recommendation

This study has effectively fulfilled its stated goals and given insightful information about the complex dynamics of AI-driven personalization in financial services in the context of Nepalese commercial banks. The main objective was to investigate how implementing AI technology and encouraging social innovation relate to one another, emphasizing how these factors together affect how workers in Nepalese commercial banks make decisions. The study's primary goal is to identify the connections between social innovation and the adoption of AI technology and how these relationships affect decision-making. The research found significant links and contributions of social innovation and AI technologies to the decision-making environment of the Nepalese banking industry through a thorough examination of survey responses and statistical evaluations. The results highlight how interrelated these elements are and how important it is for them to work together to influence how bank personnel make decisions. This study investigated how to use AI-driven decision-making in Nepal's banking industry to promote social innovation. Upon further examination of the survey results, the study determined the critical elements and tactics that foster social innovation in the context of artificial intelligence adoption. Banks looking to incorporate these components into their decision-making processes proactively can benefit from our investigation's concrete insights and deepen our grasp of the complex interactions between AI and social innovation.

This study has significant ramifications for strategic management in the financial services industry. The links found, and the combined effects of social innovation and AI technologies on the decision-making processes of personnel in Nepalese commercial banks are strategically significant. Financial institutions that understand the interdependence between AI adoption and social innovation may strategically utilize the insights gathered from this study to guide their decision-making methods. Strategic AI technology implementation may improve customer experience, data-driven decision-making, and operational efficiency while supporting larger strategic goals. Financial institutions may strategically link organizational ideals with society's demands by emphasizing

social innovation and supporting responsible and ethical AI activities. This report recognizes AI as a technology enabler and a catalyst for positive social change, and it urges financial institutions to incorporate AI into their entire organisational plans deliberately. The results highlight how crucial it is to take a comprehensive approach to strategic management that considers social and technical developments to promote long-lasting and significant decision-making procedures in the financial services industry.

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