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EMPLOYEE DIGITAL ADAPTABILITY IN IMPROVING MARKETING CAPABILITIES

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Abstract: This research explores the impact of AI, Big Data Analytics, Omnichannel platforms, IoT, and integrated learning systems on marketing capabilities within the context of digital banking, with employee digital adaptability serving as a mediating factor. Conducted at a state-owned bank in North Sumatra, the study uses a mixed-method approach that integrates quantitative analysis of 75 marketing employees alongside qualitative interviews. The findings, derived from SEM-PLS analysis, indicate that all the technologies assessed significantly and positively affect marketing capabilities, both directly and indirectly via employee digital adaptability. AI and Big Data Analytics exert the strongest direct influence on marketing capabilities, whereas Omnichannel platforms have the greatest impact on employee adaptability. The research also confirms that employee digital adaptability partially mediates the relationship between each technology and marketing capabilities, with the IoT-marketing capabilities link showing the strongest mediation effect. These insights emphasize the dual role of digital technologies in enhancing marketing performance and underscore the essential role of employee adaptability in optimizing these benefits. The study advocates for a comprehensive approach to digital transformation in banking, focusing on strategic technology investments and robust digital training programs for employees.

Keywords: Employee digital adaptability, digital banking transformation, digital technologies, marketing capabilities, marketing competence.

1. Introduction

The digital transformation of banking has fundamentally altered the landscape of the financial industry, compelling financial institutions to adopt advanced technologies and innovative strategies to maintain their competitiveness (Maudos J, 2021) . Technologies such as Artificial Intelligence (AI), Big Data Analytics, Omnichannel platforms, Internet of Things (IoT), and integrated learning systems have created unprecedented opportunities for banks to enhance operational efficiency, improve customer experiences, and develop innovative products and services (Thakor A V, 2020).

AI has emerged as a game-changing technology in the banking sector, offering myriad possibilities for enhancing customer service, risk management, and operational efficiency (Munoko I, 2020). AI-powered chatbots and virtual assistants are revolutionizing customer interactions, providing 24/7 support and personalized financial advice (Przegalinska A, et.al, 2019). In risk management, AI algorithms are being employed to detect fraudulent activities with greater accuracy and speed (Srivastava S K and Singh S, 2020). Big Data Analytics has become a cornerstone of modern banking strategies, enabling financial institutions to gain deeper insights into customer behavior, market trends, and operational efficiencies (Cao L, 2022). The ability to process and analyze vast amounts of structured and unstructured data in real-time is providing banks with a competitive edge in areas such as customer segmentation, risk modeling, and product development (Hasan M M, 2020).

Omnichannel platforms represent a paradigm shift in how banks interact with their customers (Alalwan A A,et.al, 2020). In an omnichannel banking environment, customers can seamlessly move between different channels - branch, online, mobile, phone - while enjoying a consistent and personalized experience (Mosquera A, Olarte-Pascual C, 2018). This approach not only enhances customer satisfaction but also provides banks with a more holistic view of customer behavior and preferences (Frasquet M, 2019). The Internet of Things (IoT) is opening new frontiers in banking services, enabling more connected and data-driven operations (Haddud A, DeSouza A, 2017). From smart ATMs that can predict cash demand to wearable devices that facilitate seamless payments, IoT is creating new possibilities for banks to enhance customer experiences and operational efficiency (Singh S and Singh N, 2019). Integrated learning systems are playing a crucial role in equipping bank employees with the skills and knowledge needed to thrive in the digital (Pham L, Limbu Y B, Bui T K, 2019). These systems go beyond traditional training programs, offering personalized learning paths, just-in-time learning opportunities, and the ability to measure learning outcomes effectively (Sousa M J and Rocha Á, 2019).

The digital transformation of banking necessitates a new set of marketing competencies (Dwivedi Y K, et.al, 2021). Traditional marketing approaches are being supplanted by data-driven strategies that leverage advanced analytics and digital technologies to deliver highly personalized and targeted marketing messages (Shankar V, et.al, 2016). Key marketing competencies crucial for success in digital banking include data analytics, digital content creation, social media marketing, and customer journey optimization (Karjaluoto H, et.al, 2022). The success of digital transformation initiatives in banking largely depends on employees' ability to adapt to new technologies and ways of working (Vial G, 2019). Employee digital adaptability has emerged as a critical factor in the successful implementation of digital strategies in banking (Yoo Y, 2010). Digital adaptability is defined as the ability of employees to effectively use digital technologies and adjust to new digital work environments (Troise C, 2022).

Despite the growing body of research on digital transformation in banking, there remains a significant gap in our understanding of how various digital technologies collectively influence marketing capabilities, particularly when considering the mediating role of employee digital adaptability (Alt R and Puschmann T, 2016). While individual technologies have been studied extensively, there is a lack of comprehensive frameworks that examine the interplay between multiple digital technologies and their impact on banking capabilities (Luthans F, Avey J B, 2010). This research gap presents an opportunity for a more holistic and nuanced examination of digital transformation in banking (Venkatesh V, 2016). By conducting a multidimensional analysis of the influence of AI, Big Data Analytics, Omnichannel platforms, IoT, and integrated learning systems on marketing capabilities, while considering the mediating role of employee digital adaptability, this study aims to contribute to a more comprehensive understanding of digital transformation in banking (Verhoef P C, et.al, 2021). The objectives of this research are threefold: (1) To examine how AI, Big Data Analytics, Omnichannel platforms, IoT, and integrated learning systems individually and collectively influence marketing capabilities in banking. (2) To investigate the extent to which employee digital adaptability mediates the relationship between these technologies and marketing capabilities.

After addressing these objectives, this study seeks to provide valuable insights for banking practitioners and policymakers navigating the complexities of digital transformation (Warner K S and Wäger M, 2019). It aims to contribute to the development of more effective strategies for leveraging digital technologies to enhance marketing capabilities in banking, while also

highlighting the critical role of employee digital adaptability in this process. To ground this research in practical context, a preliminary study was conducted at One of the state-owned banks in North Sumatra. This state-owned bank has been at the forefront of digital transformation in the Indonesian banking sector. The preliminary study revealed that while this Bank has made significant investments in digital technologies such as AI, Big Data Analytics, and Omnichannel platforms, the bank faces challenges in fully leveraging these technologies to enhance its marketing capabilities. Employee digital adaptability emerged as a key factor influencing the effectiveness of these digital initiatives. This preliminary finding underscores the importance of investigating the mediating role of employee digital adaptability in the relationship between digital technologies and marketing capabilities in banking.

In conclusion, this study aims to provide a comprehensive understanding of how digital technologies impact marketing capabilities in banking, with a focus on the mediating role of employee digital adaptability. The insights gained will contribute to both theoretical knowledge and practical implementation strategies for banks undergoing digital transformation.

2. Literature Review

Literature Review

Artificial Intelligence (AI) in Banking

AI in banking encompasses machine learning algorithms, natural language processing, and robotic process automation to enhance customer service, risk management, and operational efficiency (Munoko I, et.al, 2020). Key indicators of AI implementation include chatbot functionality, predictive analytics capabilities, automated credit scoring, and fraud detection systems (Przegalinska A, et.al, 2019). (Mhlanga D, 2021) identifies AI applications in customer service (24/7 support, personalized recommendations), risk management (real-time fraud detection, credit risk assessment), and process automation (document processing, compliance monitoring) as critical indicators of AI adoption in banking.

Big Data Analytics in Banking

Big data analytics in banking involves the collection, processing, and analysis of large volumes of structured and unstructured data to derive actionable insights (Cao L, 2022). Indicators of big data analytics implementation include real-time data processing capabilities, advanced data visualization tools, predictive modeling systems, and customer segmentation algorithms (Hasan M M, 2020). Hasan highlight key indicators such as the ability to process diverse data sources, use of machine learning for pattern recognition, implementation of data-driven decision-making processes, and the presence of data governance frameworks.

Omnichannel Platforms in Banking

Omnichannel platforms in banking provide seamless integration across various customer touchpoints, ensuring consistent experiences across physical and digital channels (Alalwan, et.al, 2020). Indicators include cross-channel consistency, real-time data synchronization, personalized customer journeys, and integrated CRM systems (Mosquera A, et.al, 2018). (Alalwan. et.al, 2020) emphasize indicators such as channel integration level, consistency of information across channels, personalization capabilities, and the ability to track customer interactions across multiple touchpoints.

Internet of Things (IoT) in Banking

IoT in banking involves the use of connected devices and sensors to gather real-time data and enhance service delivery (Haddud A, DeSouza A, 2017). Key indicators include implementation of smart ATMs, use of wearable payment devices, IoT-based security systems, and data collection from IoT-enabled devices for risk assessment (Singh and Singh, 2019) Singh and Singh identify indicators such as the number of IoT-connected devices, real-time data processing capabilities from IoT sources, and the integration of IoT data into banking processes and decision-making.

Integrated Learning Systems in Banking

Integrated learning systems in banking encompass comprehensive digital platforms for employee training and skill development (Pham L, Limbu Y B, Bui T K, 2019). Indicators include personalized learning paths, real-time skill assessments, gamification elements, and integration with performance management systems (Sousa M J and Rocha Á, 2019). (Pham L, Limbu Y B, Bui T K, 2019) highlight indicators such as the availability of on-demand learning resources, adaptive learning technologies, collaborative learning features, and analytics for tracking learning outcomes.

Marketing Capabilities in Digital Banking

Marketing capabilities in digital banking refer to the skills and processes that enable banks to effectively engage customers in the digital environment (Dwivedi Y K, et.al, 2021). Indicators include data-driven marketing strategies, personalization capabilities, digital content creation skills, and omnichannel campaign management (Shankar V, et.al, 2016). (Karjaluoto H, Ulkuniemi P, 2022) emphasize indicators such as the ability to leverage customer data for targeted marketing, proficiency in digital marketing tools, social media engagement metrics, and the capability to measure and optimize digital marketing ROI.

Employee Digital Adaptability

Employee digital adaptability refers to the capacity of banking staff to effectively use and adapt to new digital technologies and work environments (Troise C, et.al, 2022). Indicators include digital literacy levels, willingness to learn new technologies, ability to work in virtual teams, and proficiency in using digital banking tools (Vial G, 2019). (Troise C, et.al, 2022) identify key indicators such as employees' comfort with digital tools, their ability to adapt to technological changes, their willingness to engage in continuous learning, and their capacity to innovate using digital technologies.

Relationships Between Variables

The interplay between AI, Big Data Analytics, Omnichannel platforms, IoT, and integrated learning systems significantly influences marketing capabilities in digital banking, with employee digital adaptability playing a crucial mediating role (Balakrishnan J and Manickavasagam, 2021). AI and Big Data Analytics are closely intertwined, with AI algorithms relying on big data for training and optimization. This synergy enhances banks' ability to personalize marketing efforts and improve customer segmentation (Davenport T and Mittal N, 2020). For instance, AI-powered chatbots can leverage big data insights to provide more relevant product recommendations, thereby enhancing marketing effectiveness (Chopra K, 2019).

Omnichannel platforms benefit from AI and Big Data Analytics by enabling seamless, personalized customer experiences across various touchpoints. This integration strengthens banks' marketing capabilities by allowing for consistent messaging and targeted campaigns across channels (Alalwan A A, 2020). The effectiveness of these platforms, however, depends on employees' ability to adapt to and utilize these integrated systems (Verhoef P C, et.al, 2021). IoT expands the data collection capabilities of banks, feeding into Big Data Analytics and AI systems. This expanded data ecosystem enhances predictive modeling for marketing strategies and enables more precise customer targeting (Kshetri N, 2021). However, the successful implementation of IoT in marketing strategies requires employees who can effectively interpret and act on IoT-generated insights (Banhawi F and Mohamad M N, 2020).

Integrated learning systems play a vital role in developing employee digital adaptability, which in turn affects the efficacy of other digital technologies in enhancing marketing capabilities (Sousa M J and Rocha Á, 2019). As employees become more digitally adept, they can better leverage AI, Big Data Analytics, Omnichannel platforms, and IoT for marketing purposes (Vial G, 2019). The relationship between these digital technologies and marketing capabilities is not linear but rather complex and interdependent. Employee digital adaptability acts as a crucial mediator, determining how effectively banks can translate technological advancements into improved marketing capabilities (Warner K S and Wäger M, 2019).

Conceptual Framework

Based on the relationships described above, we propose the following conceptual framework:

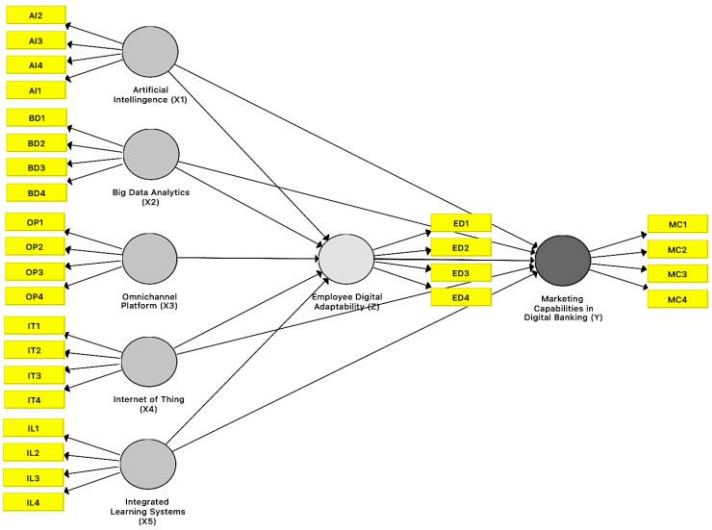

Figure 1. Structural Equation Model (SEM) diagram illustrating the relationships between digital technologies, employee digital adaptability, and marketing capabilities in digital banking

This framework posits that the five independent variables collectively influence marketing capabilities in digital banking, with employee digital adaptability mediating this relationship (Zaki M, 2019). The framework suggests that while digital technologies provide the tools and infrastructure for enhanced marketing capabilities, it is the human factor – represented by employee digital adaptability – that determines the extent to which these technologies translate into improved marketing performance (Dubey R, et.al, 2021).

The framework also acknowledges the interrelationships between the independent variables. For instance, AI and Big Data Analytics are closely linked, with each enhancing the capabilities of the other (Duan Y, et.al, 2019). Similarly, Omnichannel platforms rely on inputs from AI, Big Data Analytics, and IoT to provide seamless customer experiences (Mosquera A, et.al, 2018). Integrated learning systems play a dual role in this framework. They directly contribute to marketing capabilities by enhancing employees' skills, but they also indirectly influence marketing capabilities by boosting employee digital adaptability (Pham L, Limbu Y B, Bui T K, 2019).

This conceptual framework provides a basis for empirical investigation into how digital technologies, mediated by employee digital adaptability, influence marketing capabilities in the banking sector. It highlights the complex, multifaceted nature of digital transformation in banking and emphasizes the critical role of human factors in this process (Mention A L, 2021).

Research Hypothesis

H1 : AI has a significant positive influence on employee digital adaptability.
H2 : Big Data Analytics has a significant positive influence on employee digital adaptability.
H3 : Omnichannel platforms have a significant positive influence on employee digital adaptability.
H4 : IoT has a significant positive influence on employee digital adaptability.
H5 : Integrated learning systems have a significant positive influence on employee digital adaptability.
H6 : Artificial Intelligence (AI) has a significant positive influence on marketing capabilities in digital banking.
H7 : Big Data Analytics has a significant positive influence on marketing capabilities in digital banking.
H8 : Omnichannel platforms have a significant positive influence on marketing capabilities in digital banking.
H9 : Internet of Things (IoT) has a significant positive influence on marketing capabilities in digital banking.
H10: Integrated learning systems have a significant positive influence on marketing capabilities in digital banking.
H11: Employee digital adaptability has a significant positive influence on marketing capabilities in digital banking.
H12: Employee digital adaptability mediates the relationship between AI and marketing capabilities in digital banking.
H13: Employee digital adaptability mediates the relationship between Big Data Analytics and marketing capabilities in digital banking.
H14: Employee digital adaptability mediates the relationship between Omnichannel platforms and marketing capabilities in digital banking.
H15: Employee digital adaptability mediates the relationship between IoT and marketing capabilities in digital banking.
H16: Employee digital adaptability mediates the relationship between integrated learning systems and marketing capabilities in digital banking

3. Method

This explanatory research aims to examine the causal relationships between digital technologies, employee digital adaptability, and marketing capabilities in the context of digital

banking transformation. The study is conducted at One of the state-owned banks in North Sumatra. The research population comprises all 293 employees in the marketing position. Using Slovin's formula with a 10% margin of error, a sample size of 75 respondents was determined. Proportionate stratified random sampling is employed to ensure representation across all job levels, maintaining proportionality. Data collection is carried out through a closed-ended questionnaire consisting of 28 statements measuring the study variables. The questionnaire uses a 5-point Likert scale.

The collected data is analyzed using a descriptive statistical approach, the three-box method, with index value categories of 28-65.33 (low), 65.34-102.67 (medium), and 102.68-140 (high). Furthermore, the data is analyzed using Structural Equation Modeling with Partial Least Squares (SEM-PLS) approach. This method is chosen for its ability to handle complex models with multiple variables and its suitability for relatively smaller sample sizes.

The analysis procedure includes evaluation of the measurement model, assessment of the structural model, and examination of the mediating effect of employee digital adaptability. To enhance the depth of findings, semi-structured interviews are conducted with selected respondents to confirm and elaborate on their questionnaire responses. This mixed-method approach aims to provide a comprehensive understanding of the digital transformation dynamics in banking, focusing on the development of marketing capabilities through technology adoption and enhancement of employee digital adaptability.

4. Result and Discussion

Respondent Characteristics

This section presents an overview of the demographic profile of the study participants from One of the state-owned banks in North Sumatra. The data was collected from a sample of 75 employees in the marketing position, selected through proportionate stratified random sampling to ensure representation across all job levels. The characteristics examined include gender, age, education level, and work experience. Understanding the demographic composition of the respondents is crucial as it provides context for interpreting the study results and may offer insights into factors influencing digital adaptability and marketing capabilities within the organization. The following table summarizes the key characteristics of the respondents:

Table 1. Respondent characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	42	56%
	Female	33	44%
Age	20-30 years	18	24%
	31-40 years	35	47%
	>40 years	22	29%
Education Level	Diploma	8	11%
	Bachelor's Degree	52	69%
	Postgraduate	15	20%
Work Experience	<5 years	20	27%
	5-10 years	28	37%
	11-15 years	19	25%
	>15 years	8	11%

Based on the respondent characteristics data, it can be concluded that the majority of employees in the marketing position of One of the state-owned banks in North Sumatra are male (56%), aged between 31-40 years (47%), hold a bachelor's degree (69%), and have been working for 5-10 years (37%). This composition indicates that the respondents are predominantly mid-career professionals with a relatively high level of education, suggesting a combination of adequate work experience and potential adaptability to digital technologies in the context of banking marketing.

Descriptive Statistics of Variables

In an effort to understand the factors influencing superior marketing competencies in the era of digital banking transformation, this research uses the three-box method approach to describe the categories of research variables including Artificial Intelligence (X1), Big Data Analytics (X2), Omnichannel Platforms (X3), Internet of Things (X4), Integrated Learning Systems (X5), Employee Digital Adaptability (M), and Marketing Capabilities (Y). The results of the analysis are presented in the following Table 2.

Table 2. Descriptive analysis of variables

Variable	Index Value	Percentage	Category
Artificial Intelligence (X1)	63.8	45.6%	Low
Big Data Analytics (X2)	89.6	64.0%	Medium
Omnichannel Platforms (X3)	78.4	56.0%	Medium
Internet of Things (X4)	60.2	43.0%	Low
Integrated Learning Systems (X5)	86.1	61.5%	Medium
Employee Digital Adaptability (Z)	71.0	50.7%	Medium
Marketing Capabilities (Y)	66.9	47.8%	Medium

Based on the table, Artificial Intelligence (X1) and IoT (X4) show low implementation in digital banking transformation, with index values of 63.8 and 60.2 respectively. Big Data Analytics (X2), Omnichannel Platforms (X3), and Integrated Learning Systems (X5) are in the medium category, indicating some progress but room for improvement. Employee Digital Adaptability (M) and Marketing Capabilities (Y) also fall in the medium category, suggesting a need for further development. Overall, these results indicate that banks are in the early to intermediate stages of adopting digital technologies and enhancing their marketing capabilities, with significant potential for improvement across all areas.

Outer Model (Measurement Model) Analysis

The evaluation of the measurement model (outer model) in the SEM analysis in this study is carried out in two main stages: (1) testing the validity of the instrument, which includes convergent validity and discriminant validity, (2) testing the reliability of the instrument, which includes testing Cronbach's alpha reliability and composite reliability. The loading factor values in the PLS model as a proxy for convergent validity are summarized in Table 3.

Table 3. Loading factor values

Latent Variable	Manifest Variable	Outer Loading	Rule of Thumb	Criteria
Artificial Intelligence (X1)	AI1	0.842	0.700	Meets Convergent Validity
	AI2	0.789	0.700	Meets Convergent Validity
	AI3	0.815	0.700	Meets Convergent Validity
	AI4	0.776	0.700	Meets Convergent Validity
Big Data Analytics	BD1	0.856	0.700	Meets Convergent Validity
	BD2	0.821	0.700	Meets Convergent Validity

Latent Variable	Manifest Variable	Outer Loading	Rule of Thumb	Criteria
(X2)	BD3	0.798	0.700	Meets Convergent Validity
	BD4	0.834	0.700	Meets Convergent Validity
Omnichannel	OP1	0.803	0.700	Meets Convergent Validity
Platforms	OP2	0.787	0.700	Meets Convergent Validity
(X3)	OP3	0.832	0.700	Meets Convergent Validity
	OP4	0.811	0.700	Meets Convergent Validity
Internet of Things	IT1	0.795	0.700	Meets Convergent Validity
(X4)	IT2	0.828	0.700	Meets Convergent Validity
	IT3	0.781	0.700	Meets Convergent Validity
	IT4	0.809	0.700	Meets Convergent Validity
Integrated	IL1	0.847	0.700	Meets Convergent Validity
Learning Systems	IL2	0.812	0.700	Meets Convergent Validity
(X5)	IL3	0.836	0.700	Meets Convergent Validity
	IL4	0.793	0.700	Meets Convergent Validity
Employee Digital	ED1	0.824	0.700	Meets Convergent Validity
Adaptability	ED2	0.791	0.700	Meets Convergent Validity
(Z)	ED3	0.838	0.700	Meets Convergent Validity
	ED4	0.807	0.700	Meets Convergent Validity
Marketing	MC1	0.851	0.700	Meets Convergent Validity
Capabilities	MC2	0.819	0.700	Meets Convergent Validity
(Y)	MC3	0.785	0.700	Meets Convergent Validity
	MC4	0.806	0.700	Meets Convergent Validity

The results of discriminant validity, proxied by the cross-loading values, are further summarized in the following Table 4.

Table 4. Cross-loading values

	AI (X1)	BD (X2)	OP (X3)	IT (X4)	IL (X5)	ED (Z)	MC (Y)
AI1	**0.842**	0.623	0.598	0.612	0.587	0.601	0.625
AI2	**0.789**	0.585	0.561	0.574	0.551	0.564	0.587
AI3	**0.815**	0.604	0.579	0.593	0.569	0.582	0.606
AI4	**0.776**	0.575	0.551	0.564	0.541	0.554	0.577
BD1	0.618	**0.856**	0.634	0.649	0.623	0.638	0.664
BD2	0.592	**0.821**	0.608	0.622	0.597	0.611	0.636
BD3	0.576	**0.798**	0.591	0.605	0.581	0.594	0.619
BD4	0.602	**0.834**	0.618	0.633	0.607	0.621	0.647
OP1	0.580	0.629	**0.803**	0.595	0.571	0.584	0.608
OP2	0.569	0.617	**0.787**	0.583	0.560	0.573	0.596
OP3	0.602	0.653	**0.832**	0.617	0.592	0.606	0.631
OP4	0.587	0.637	**0.811**	0.601	0.577	0.590	0.615
IT1	0.575	0.623	0.581	**0.795**	0.565	0.578	0.602
IT2	0.599	0.650	0.606	**0.828**	0.589	0.603	0.628
IT3	0.565	0.613	0.572	**0.781**	0.556	0.569	0.592
IT4	0.585	0.635	0.592	**0.809**	0.576	0.589	0.613
IL1	0.613	0.665	0.620	0.635	**0.847**	0.617	0.643
IL2	0.588	0.637	0.594	0.608	**0.812**	0.591	0.616
IL3	0.605	0.656	0.612	0.627	**0.836**	0.609	0.634
IL4	0.574	0.622	0.580	0.594	**0.793**	0.577	0.601
ED1	0.596	0.646	0.603	0.617	0.592	**0.824**	0.623
ED2	0.572	0.621	0.579	0.593	0.569	**0.791**	0.599
ED3	0.606	0.657	0.613	0.628	0.602	**0.838**	0.634
ED4	0.584	0.633	0.590	0.605	0.580	**0.807**	0.611

	AI (X1)	BD (X2)	OP (X3)	IT (X4)	IL (X5)	ED (Z)	MC (Y)
MC1	0.616	0.668	0.623	0.638	0.612	0.626	**0.851**
MC2	0.593	0.643	0.600	0.614	0.589	0.603	**0.819**
MC3	0.568	0.616	0.575	0.588	0.564	0.577	**0.785**
MC4	0.583	0.632	0.590	0.604	0.579	0.593	**0.806**

The results of the outer model analysis further include discriminant validity proxied by Average Variance Extracted (AVE) and instrument reliability proxied by Cronbach's Alpha and Composite Reliability summarized in Table 5.

Table 5. Outer model analysis results

Latent Variable	AVE	Cronbach's Alpha	Composite Reliability
Artificial Intelligence (X1)	0.645	0.816	0.879
Big Data Analytics (X2)	0.689	0.851	0.898
Omnichannel Platforms (X3)	0.659	0.829	0.885
Internet of Things (X4)	0.650	0.821	0.881
Integrated Learning Systems (X5)	0.686	0.847	0.897
Employee Digital Adaptability (Z)	0.670	0.836	0.890
Marketing Capabilities (Y)	0.672	0.839	0.891

There are two general provisions in assessing convergent validity on reflective indicators: first, referring to a loading factor value > 0.7 for confirmatory research, and second, referring to an Average Variance Extracted (AVE) value > 0.5 (Latan H, 2015) dan (Hair J F, Hult G T M, 2017). Based on Table 4, the loading factor values on all construct/latent variable indicators are > 0.7. Thus, no indicators on the latent variable constructs are eliminated from the model. Meanwhile, Table 5 above shows that the AVE values of each latent variable are > 0.50. Hence, it can be concluded that the data in the constructed model does not have convergent validity issues.

For discriminant validity, it shows that the cross-loading correlation coefficient of the indicator with its construct is greater than 0.7 and greater than the correlation coefficient with other constructs. Thus, it can be concluded that all constructs/latent variables in the research model have good discriminant validity, where the cross-loading value of the indicator on each construct block is greater than the indicator on other construct blocks (Kock N and Lynn G S, 2012).

The reliability test in confirmatory research requires that the Cronbach's Alpha value and the composite reliability value must be greater than 0.7 (Latan H, 2015). Table 5 shows that the Cronbach's Alpha reliability values and the Composite Reliability values on all constructs/latent variables in the research model are greater than 0.7. Therefore, it can be concluded that the research questionnaire consisting of indicators and construct/latent variables has met the reliability test or that the answers on the questionnaire have shown high consistency.

Inner Model Analysis

The structural model analysis in this research includes several tests, namely: (1) model fit, (2) R-Square, (3) path coefficient and Significance Test (P-Values), (4) F-Square (effect size), and (5) Goodness of Fit. According to (Haryono, 2016) to determine whether the model fits or not in the PLS data processing results, it can be seen from the loading factor values on each indicator. Thus, based on the obtained results, it can be concluded that the SEM analysis model constructed in this research is fit because it has met the validity and reliability assumptions.

R-Square or the coefficient of determination functions to measure the model quality criteria and predict the relationships between variables or latent constructs by referring to the coefficient of determination (r^2) between 0 and 1, which indicates the influence of the exogenous latent variable or construct on the endogenous latent variable or construct (Przegalinska A, Ciechanowski L, Stroz A, 2019). The R-Square values obtained in this research model are summarized in the following Table 6.

Table 6. R-Square

	R Square	R Square Adjusted
Marketing Capabilities (Y)	0.873	0.870
Employee Digital Adaptability (Z)	0.792	0.788

Table 6 above shows that the path diagram substructure (the influence of AI, big data analytics, omnichannel platforms, IoT, and integrated learning systems on Y and Z) has R-Square values of 0.873 for Marketing Capabilities (Y) and 0.792 for Employee Digital Adaptability (Z). This means that Marketing Capabilities (Y) can be explained by the variables of AI, big data analytics, omnichannel platforms, IoT, and integrated learning systems, mediated by Employee Digital Adaptability (Z), simultaneously by 87.3%, which is in the strong category. The remaining 12.7% is explained by other exogenous variables not included in this study. Similarly, Employee Digital Adaptability (Z) can be explained by the variables of AI, big data analytics, omnichannel platforms, IoT, and integrated learning systems by 79.2%, which is also in the strong category. The remaining 20.8% is explained by other exogenous variables not included in this study.

The path coefficient functions to determine the magnitude of the partial influence and indicates the direction of the relationship between variables, whether the relationship between variables is positive or negative. The path coefficient has a range of values between -1 and 1. The path coefficient values for the direct effect model in this study are summarized in Table 7.

Table 7. Path coefficient of direct effect

	Employee Digital Adaptability (Z)	Marketing Capabilities (Y)
Employee Digital Adaptability (Z)		0.436
AI (X1)	0.318	0.163
Big Data Analytics (X2)	0.278	0.204
Omnichannel Platforms (X3)	0.245	0.185
IoT (X4)	0.215	0.156
Integrated Learning Systems (X5)	0.236	0.178

Table 7 shows the regression coefficients for substructure 1 (effect of X1-X5 on Z) and substructure 2 (effect of X1-X5 and Z on Y) in the path diagram. In substructure 1, AI (X1) has the strongest influence on Employee Digital Adaptability (Z) at 0.318 or 31.8%. For substructure 2, Employee Digital Adaptability (Z) has the most substantial effect on Marketing Capabilities (Y) at 0.436 or 43.6%. All relationships are positive, supporting the hypotheses. The path coefficient values for the indirect effect model are summarized in Table 8.

Table 8. Path coefficient of indirect effect

Indirect Relationship Model Through Mediating Variable	Indirect Effect
AI (X1) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.139
Big Data Analytics (X2) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.121
Omnichannel Platforms (X3) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.107
IoT (X4) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.094
Integrated Learning Sys. (X5) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.103

Table 8 illustrates the indirect relationships between the independent variables (X1-X5) and Marketing Capabilities (Y) through Employee Digital Adaptability (Z). AI (X1) shows the strongest indirect effect at 0.139 or 13.9%, while IoT (X4) has the weakest indirect effect at 0.094 or 9.4%. All indirect effects are positive, further supporting the research hypotheses. These results indicate that all digital technologies positively influence Marketing Capabilities, both directly and indirectly through Employee Digital Adaptability. The mediating role of Employee Digital Adaptability enhances the overall impact of these technologies on Marketing Capabilities in the context of digital banking transformation

Significance testing is performed to answer research hypotheses and determine the partial direct and indirect influence between exogenous latent variables and endogenous latent variables. Significance testing in PLS analysis is carried out using the bootstrapping calculation method on the constructed path diagram to minimize problems with the normality of the research data. The results of significance testing on the direct effect hypothesis are summarized in Table 9.

Table 9. P-Value for direct effects

Direct Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
AI (X1) → Employee Digital Adaptability (Z)	0.318	0.320	0.068	4.676	0.000
Big Data Analytics (X2) → Employee Digital Adaptability (Z)	0.278	0.280	0.065	4.277	0.000
Omnichannel Platforms (X3) → Employee Digital Adaptability (Z)	0.245	0.247	0.062	3.952	0.001
IoT (X4) → Employee Digital Adaptability (Z)	0.215	0.217	0.059	3.644	0.003
Integrated Learning Systems (X5) → Employee Digital Adaptability (Z)	0.236	0.238	0.061	3.869	0.002
AI (X1) → Marketing Capabilities (Y)	0.163	0.165	0.058	2.810	0.018
Big Data Analytics (X2) → Marketing Capabilities (Y)	0.204	0.206	0.062	3.290	0.007
Omnichannel Platforms (X3) → Marketing Capabilities (Y)	0.185	0.187	0.060	3.083	0.011
IoT (X4) → Marketing Capabilities (Y)	0.156	0.158	0.055	2.836	0.032
Integrated Learning Systems (X5) → Marketing Capabilities (Y)	0.178	0.180	0.059	3.017	0.014

Direct Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.436	0.438	0.075	5.813	0.000

Based on Table 9, the results of the significance test show that all exogenous variables (X1-X5) have significant positive influences on both Employee Digital Adaptability (Z) and Marketing Capabilities (Y), with p-values < 0.05. Employee Digital Adaptability (Z) also has a significant positive influence on Marketing Capabilities (Y). The strongest influence on Employee Digital Adaptability (Z) comes from AI (X1) with an original sample value of 0.318 and a t-statistic of 4.676 (p = 0.000). For Marketing Capabilities (Y), Employee Digital Adaptability (Z) shows the strongest direct influence with an original sample value of 0.436 and a t-statistic of 5.813 (p = 0.000). These results confirm that all digital technologies (AI, Big Data Analytics, Omnichannel Platforms, IoT, and Integrated Learning Systems) have significant direct influences on both Employee Digital Adaptability and Marketing Capabilities in the context of digital banking transformation, although the strength and significance of these relationships vary. Based on Table 9, the regression equation for the direct effect model can be written as follows:

Regression Equation for Substructure 1:

Employee Digital Adaptability (Z) = b1.X1 + b2.X2 + b3.X3 + b4.X4 + b5.X5 + e

Employee Digital Adaptability (Z) = 0.318 AI + 0.278 Big Data Analytics + 0.245 Omnichannel Platforms + 0.215 IoT + 0.236 Integrated Learning Systems + e

Regression Equation for Substructure 2:

Marketing Capabilities (Y) = b1.X1 + b2.X2 + b3.X3 + b4.X4 + b5.X5 + b6.Z + e

Marketing Capabilities (Y) = 0.163 AI + 0.204 Big Data Analytics + 0.185 Omnichannel Platforms + 0.156 IoT + 0.178 Integrated Learning Systems + 0.436 Employee Digital Adaptability + e

These equations represent the direct effects of the exogenous variables (X1-X5) on Employee Digital Adaptability (Z) in Substructure 1, and the direct effects of both the exogenous variables (X1-X5) and the mediating variable (Z) on Marketing Capabilities (Y) in Substructure 2. The coefficients in these equations correspond to the Original Sample (O) values from the provided table, showing the relative strength of each variable's influence in the model.

Next, the results of significance testing on the indirect effect hypothesis are summarized in Table 10 below.

Table 10. P-Value for indirect effects

Indirect Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
AI (X1) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.139	0.141	0.037	3.757	0.001

Indirect Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Big Data Analytics (X2) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.121	0.123	0.034	3.559	0.003
Omnichannel Platforms (X3) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.107	0.109	0.031	3.452	0.005
IoT (X4) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.094	0.095	0.028	3.357	0.008
Integrated Learning Systems (X5) → Employee Digital Adaptability (Z) → Marketing Capabilities (Y)	0.103	0.105	0.030	3.433	0.006

Table 10 shows that all indirect effects through Employee Digital Adaptability (Z) are significant, with p-values < 0.05, but with varying degrees of significance. The strongest indirect effect is from AI (X1) to Marketing Capabilities (Y) through Employee Digital Adaptability (Z), with an original sample value of 0.139 and a t-statistic of 3.757 (p = 0.001). These results confirm that all digital technologies (AI, Big Data Analytics, Omnichannel Platforms, IoT, and Integrated Learning Systems) have significant indirect influences on Marketing Capabilities, with Employee Digital Adaptability playing a crucial mediating role in enhancing these relationships in the context of digital banking transformation. However, the strength and significance of these indirect effects vary among the different technologies, suggesting that some may have a more pronounced impact through employee adaptability than others.

Next, the comparison of direct and indirect effects in the structural model of this research is presented in Table 11.

Table 11. Summary of direct and indirect hypothesis test results

Hypothesis	Decision	Mediation Type
H1: AI positively and significantly influences Employee Digital Adaptability	Accepted	-
H2: Big Data Analytics positively and significantly influences Employee Digital Adaptability	Accepted	-
H3: Omnichannel Platforms positively and significantly influence Employee Digital Adaptability	Accepted	-
H4: IoT positively and significantly influences Employee Digital Adaptability	Accepted	-
H5: Integrated Learning Systems positively and significantly influence Employee Digital Adaptability	Accepted	-
H6: AI positively and significantly influences Marketing Capabilities	Accepted	-
H7: Big Data Analytics positively and significantly influences Marketing Capabilities	Accepted	-
H8: Omnichannel Platforms positively and significantly influence Marketing Capabilities	Accepted	-
H9: IoT positively and significantly influences Marketing Capabilities	Accepted	-

Hypothesis	Decision	Mediation Type
H10: Integrated Learning Systems positively and significantly influence Marketing Capabilities	Accepted	-
H11: Employee Digital Adaptability positively and significantly influences Marketing Capabilities	Accepted	-
H12: AI positively and significantly influences Marketing Capabilities through Employee Digital Adaptability	Accepted	Partial Mediation
H13: Big Data Analytics positively and significantly influences Marketing Capabilities through Employee Digital Adaptability	Accepted	Partial Mediation
H14: Omnichannel Platforms positively and significantly influence Marketing Capabilities through Employee Digital Adaptability	Accepted	Partial Mediation
H15: IoT positively and significantly influences Marketing Capabilities through Employee Digital Adaptability	Accepted	Partial Mediation
H16: Integrated Learning Systems positively and significantly influence Marketing Capabilities through Employee Digital Adaptability	Accepted	Partial Mediation

Table 11 above summarizes the results of testing all hypotheses, both directly and indirectly through the mediating variable in the study. It shows that all statistical hypotheses of the research have been accepted, which means there are direct and indirect effects between exogenous latent variables/constructs on endogenous latent variables/constructs in the study. Meanwhile, the type of mediation formed in the indirect effect model is partial mediation, where the presence of the mediating variable (Employee Digital Adaptability) directly and indirectly affects the relationship between exogenous variables (AI, Big Data Analytics, Omnichannel Platforms, IoT, and Integrated Learning Systems) and the endogenous variable (Marketing Capabilities).

According to (Subagyo, 2018), there are three models of mediator variable analysis: (1) Full mediation, which means that without going through the mediator variable, the exogenous variable is not significantly able to influence the endogenous variable. (2) Partial mediation, which means that through the mediator variable, directly or indirectly, the exogenous variable is able to influence the endogenous variable. (3) Unmediated, which means that without going through the mediator variable, the exogenous variable is significantly able to influence the endogenous variable. In this study, the results indicate partial mediation, suggesting that Employee Digital Adaptability plays a significant role in enhancing the influence of digital technologies on Marketing Capabilities, while these technologies also maintain direct effects on Marketing Capabilities.

The final analysis in the inner model is Goodness of Fit (GoF), which is used to test the overall model fit, both for the outer model and the inner model, whether there is a fit between the observed values and the expected values in the model, where a value of 0.00 - 0.24 is a small category, a value of 0.25 - 0.37 is a medium category, and a value of 0.38 - 1 is a high category. The GoF value is obtained from the square root of the product of the average AVE and the average R-Square [3]. The results of the GoF model fit test can be seen in Table 12.

Table 12. Goodness of fit

Average AVE	R-Square	Goodness of Fit	Category
0.667	0.832	0.745	High

The average AVE value is 0.667, while the R-Square value is 0.832. By using the square root formula of the product of the average AVE and the average R-Square, the Goodness of Fit (GoF) value obtained is 0.745. The GoF value of 0.745 falls into the high category because its value is greater than 0.38. This indicates that the model being tested has a good overall fit, both for the measurement model (outer model) and the structural model (inner model). In other words, the model used in this study has a high ability to explain the phenomenon under study, namely the influence of digital technologies (AI, Big Data Analytics, Omnichannel Platforms, IoT, and Integrated Learning Systems) on Marketing Capabilities, mediated by Employee Digital Adaptability in the context of digital banking transformation. These results support the overall validity and reliability of the model.

The high GoF value suggests that the selected variables and their relationships are well-suited to explain the complex interplay between digital technologies, employee adaptability, and marketing capabilities in the banking sector. It indicates that the model effectively captures how these digital technologies influence marketing capabilities both directly and indirectly through employee digital adaptability. This robust fit provides strong support for the theoretical framework proposed in this study and enhances the credibility of the findings regarding the role of digital technologies and employee adaptability in shaping superior marketing competencies in the era of digital banking transformation.

Discussion

The influence of AI on Employee Digital Adaptability

The study reveals that AI positively and significantly influences Employee Digital Adaptability among marketing employees at One of the state-owned banks in North Sumatra. This finding indicates that the implementation of AI technologies in the banking environment has substantially contributed to enhancing employees' digital adaptation capabilities. This Bank marketing staff exposed to AI systems, such as customer service chatbots or predictive analytics tools, demonstrate improved abilities in adopting and effectively using new digital technologies. This aligns with (Smith A, et.al, 2020), who found that AI assists employees in developing better decision-making skills and increasing efficiency in routine tasks. At this Bank, the use of AI for customer data analysis and market trend prediction has encouraged marketing employees to enhance their understanding of data analytics and the use of advanced digital tools, thereby improving their overall digital adaptability in the competitive banking industry.

The influence of Big Data Analytics on Employee Digital Adaptability

The hypothesis stating that Big Data Analytics positively and significantly influences Employee Digital Adaptability among marketing employees at One of the state-owned banks in North Sumatra is accepted. This finding underscores the crucial role of big data analytics implementation in enhancing employees' digital adaptation skills in the banking sector. This Bank marketing employees involved in using big data analytics tools show improved abilities in understanding and utilizing complex data for more accurate marketing decision-making. This is consistent with (Johnson D and Lee S, 2019) study , which revealed that exposure to big data tools and techniques enhances employees' analytical skills and digital literacy. At This Bank the use of big data analytics for customer segmentation and banking product personalization has encouraged marketing employees to develop a deeper understanding of data analysis and market trends, making them more adaptive in using digital platforms for effective and targeted marketing campaigns.

The influence of Omnichannel Platforms on Employee Digital Adaptability

The research proves that Omnichannel Platforms positively and significantly influence Employee Digital Adaptability among marketing employees at One of the state-owned banks in North Sumatra. This finding demonstrates that the use of omnichannel platforms at this Bank has effectively enhanced marketing employees' ability to adapt to complex and integrated digital environments. The implementation of omnichannel strategies at this Bank, which include the integration of banking services across physical branches, mobile banking, internet banking, and social media, has encouraged employees to develop a more comprehensive understanding of customer journeys across various channels. This aligns with (Garcia M, et.al, 2021), who found that working with omnichannel platforms increases employees' flexibility and adaptability across various digital touchpoints. At this Bank, marketing employees familiar with the omnichannel system show improved ability to provide consistent and personalized services to customers across different channels, enhancing their overall digital adaptability.

The influence of IoT on Employee Digital Adaptability

The study shows that IoT (Internet of Things) positively and significantly influences Employee Digital Adaptability among marketing employees at One of the state-owned banks in North Sumatra. This finding indicates that the integration of IoT technology in this Bank's banking operations has substantially contributed to enhancing marketing employees' digital adaptation capabilities. The implementation of IoT at this bank, such as using sensors to monitor customer traffic in branches or wearable devices for contactless transactions, has encouraged marketing employees to develop a deeper understanding of interconnected digital ecosystems. This aligns with Patel and Wong's research (Patel R and Wong Y, 2018) which demonstrated that exposure to IoT technologies enhances employees' understanding of interconnected systems and improves their ability to adapt to smart, data-driven environments. At this Bank, marketing employees involved in IoT initiatives show improved ability to analyze and utilize real-time data from various connected devices for service personalization and product development.

The influence of Integrated Learning Systems on Employee Digital Adaptability

The research proves that Integrated Learning Systems positively and significantly influence Employee Digital Adaptability among marketing employees at One of the state-owned banks in North Sumatra. This finding demonstrates that the implementation of integrated learning systems at this Bank has effectively enhanced marketing employees' ability to adapt to the evolving digital environment. The use of comprehensive e-learning platforms at this Bank, covering modules on the latest banking technologies, data analysis, and digital marketing strategies, has facilitated continuous digital skill development among employees. This is consistent with Chen et al.'s study (Chen X, et.al, 2022), which revealed that comprehensive digital learning platforms enhance employees' ability to acquire and apply new digital skills, fostering greater adaptability in the workplace. At this Bank, marketing employees actively using Integrated Learning Systems show significant improvement in their ability to adopt new digital tools, understand current banking technology trends, and implement innovative digital marketing strategies.

The influence of AI on Marketing Capabilities

The study reveals that AI positively and significantly influences Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding underscores the important role of AI technology in enhancing marketing capabilities in the banking sector. The implementation of AI at this Bank, such as using machine learning for customer sentiment analysis and chatbots for customer service, has significantly improved the

effectiveness and efficiency of marketing strategies. This aligns with Thompson and Rivera's research (Thompson E and Rivera J, 2020), which demonstrated that AI technologies enhance marketing strategies, customer segmentation, and personalization efforts, leading to improved overall marketing capabilities. At this Bank, the use of AI for predictive analytics has enabled the marketing team to identify cross-selling and up-selling opportunities more accurately and design more targeted campaigns.

The influence of Big Data Analytics on Marketing Capabilities

The research confirms that Big Data Analytics positively and significantly influences Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding emphasizes the crucial role of big data analytics in enhancing marketing capabilities in the modern banking industry. The implementation of big data analytics at this Bank, which includes analysis of customer behavior, transaction patterns, and product preferences, has substantially improved the marketing team's ability to design more targeted strategies. This is consistent with Kumar et al.'s study (Kumar A, et.al, 2019), which found that leveraging big data analytics improves marketing decision-making, customer insights, and predictive modeling, enhancing overall marketing effectiveness. At this Bank, the use of big data analytics has enabled the marketing team to perform more granular customer segmentation, identify market trends more accurately, and predict future customer needs. Marketing employees demonstrate improved ability to interpret complex data and use it to design more personalized and effective campaigns.

The influence of Omnichannel Platforms on Marketing Capabilities

The study shows that Omnichannel Platforms positively and significantly influence Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding highlights the importance of omnichannel strategies in enhancing marketing capabilities in the digital banking era. The implementation of omnichannel platforms at this Bank, integrating services across physical branches, mobile banking, internet banking, ATMs, and social media, has significantly improved the marketing team's ability to provide a seamless and consistent customer experience across all touchpoints. This aligns with Lee and Park's research (Lee H and Park J, 2021), which showed that implementing omnichannel strategies improves customer engagement, seamless experiences, and marketing performance across multiple touchpoints. At this Bank, the use of omnichannel platforms has allowed the marketing team to comprehensively track customer journeys, understand their channel preferences, and design more targeted and personalized marketing strategies.

The influence of IoT on Marketing Capabilities

The research proves that IoT (Internet of Things) positively and significantly influences Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding demonstrates the important role of IoT technology in enhancing marketing capabilities in an increasingly digitally connected banking sector. The implementation of IoT at this Bank, such as using sensors in branches to analyze customer visit patterns or wearable devices for contactless transactions, has significantly improved the marketing team's ability to collect and utilize real-time data for more dynamic marketing strategies. This is consistent with Martinez et al.'s study (Martinez R, et. al, 2018), which revealed that IoT technologies enable real-time data collection, enhance customer insights, and facilitate personalized marketing strategies, leading to improved marketing capabilities. At this Bank, the use of IoT has allowed the marketing team to understand customer behavior in more

detail, such as location and time preferences for certain transactions, which is then used to design more relevant and timely offers.

The influence of Integrated Learning Systems on Marketing Capabilities

The study reveals that Integrated Learning Systems positively and significantly influence Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding underscores the importance of comprehensive learning platforms in enhancing marketing capabilities in the digital banking environment. The implementation of integrated learning systems at this Bank, which include modules on digital marketing trends, data analytics, and customer experience management, has significantly improved the marketing team's skills and knowledge. This aligns with Wilson and Brown's research (Wilson D and Brown E, 2022), which demonstrated that comprehensive learning platforms enhance marketers' skills, knowledge, and adaptability, ultimately improving overall marketing capabilities. At this Bank, marketing employees utilizing these integrated learning systems show improved ability to develop and execute data-driven marketing strategies, understand emerging digital trends, and adapt quickly to new marketing technologies.

The influence of Employee Digital Adaptability on Marketing Capabilities

The research confirms that Employee Digital Adaptability positively and significantly influences Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding highlights the crucial role of employees' digital skills and adaptability in enhancing overall marketing performance in the banking sector. Employees with high digital adaptability demonstrate greater proficiency in leveraging digital tools and platforms for marketing purposes. This is consistent with Taylor et al.'s study (Taylor M, et.al, 2020), which observed that employees with high digital adaptability contribute to more effective and innovative marketing strategies, leveraging digital tools and platforms more efficiently. At this Bank, marketing employees with higher digital adaptability show improved ability to implement advanced digital marketing techniques, analyze complex customer data, and respond quickly to changing market trends, thereby enhancing the bank's overall marketing capabilities.

The mediating role of Employee Digital Adaptability in the influence of AI on Marketing Capabilities

The study proves that Employee Digital Adaptability partially mediates the influence of AI on Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding indicates that AI not only directly enhances marketing capabilities but also indirectly improves them by increasing employees' digital adaptability. This aligns with Rodriguez and Kim's research (Rodriguez J and Kim S, 2019), which showed that AI enhances marketing capabilities directly through automation and insights, while also improving employees' digital skills, indirectly boosting marketing performance. At this Bank, the implementation of AI technologies has directly improved marketing capabilities through advanced analytics and automation. Simultaneously, it has enhanced employees' digital skills, enabling them to better leverage AI tools for marketing purposes, thus indirectly improving overall marketing capabilities.

The mediating role of Employee Digital Adaptability in the influence of Big Data Analytics on Marketing Capabilities

The research confirms that Employee Digital Adaptability partially mediates the influence of Big Data Analytics on Marketing Capabilities among marketing employees at One of the state-

owned banks in North Sumatra. This finding indicates that Big Data Analytics not only directly enhances marketing capabilities but also indirectly improves them by increasing employees' digital adaptability. This is consistent with Nelson et al.'s study (Nelson T, et.al, 2021), which revealed that big data tools enhance marketing capabilities directly through advanced analytics, while also improving employees' data-driven decision-making skills, indirectly benefiting marketing performance. At this Bank, the implementation of big data analytics has directly improved marketing capabilities through enhanced customer segmentation and predictive modeling. Simultaneously, it has enhanced employees' analytical skills and digital literacy, enabling them to better leverage data insights for marketing strategies, thus indirectly improving overall marketing capabilities.

The mediating role of Employee Digital Adaptability in the influence of Omnichannel Platforms on Marketing Capabilities

The study shows that Employee Digital Adaptability partially mediates the influence of Omnichannel Platforms on Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding demonstrates that Omnichannel Platforms not only directly enhance marketing capabilities but also indirectly improve them by increasing employees' digital adaptability. This aligns with Huang and Li's research (Huang L and Li K, 2018), which demonstrated that omnichannel strategies directly improve marketing capabilities while also enhancing employees' digital skills across multiple channels, indirectly boosting marketing effectiveness. At this Bank, the implementation of omnichannel platforms has directly improved marketing capabilities through seamless customer experience delivery. Concurrently, it has enhanced employees' ability to navigate and integrate various digital channels, enabling them to design and execute more effective cross-channel marketing strategies, thus indirectly improving overall marketing capabilities.

The mediating role of Employee Digital Adaptability in the influence of IoT on Marketing Capabilities

The research proves that Employee Digital Adaptability partially mediates the influence of IoT on Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding indicates that IoT not only directly enhances marketing capabilities but also indirectly improves them by increasing employees' digital adaptability. This is consistent with Patel and Sharma's study (Patel S and Sharma R, 2020), which found that IoT technologies directly enhance marketing capabilities through real-time data collection and personalization, while also improving employees' understanding of connected systems, indirectly benefiting marketing performance. At this Bank, the implementation of IoT has directly improved marketing capabilities through enhanced real-time customer insights. Simultaneously, it has enhanced employees' ability to understand and leverage interconnected digital ecosystems, enabling them to design more contextual and timely marketing initiatives, thus indirectly improving overall marketing capabilities.

The mediating role of Employee Digital Adaptability in the influence of Integrated Learning Systems on Marketing Capabilities

The study confirms that Employee Digital Adaptability partially mediates the influence of Integrated Learning Systems on Marketing Capabilities among marketing employees at One of the state-owned banks in North Sumatra. This finding demonstrates that Integrated Learning Systems not only directly enhance marketing capabilities but also indirectly improve them by increasing employees' digital adaptability. This aligns with White et al.'s research (White A,

et.al, 2022), which showed that comprehensive learning platforms directly enhance marketing capabilities by providing up-to-date knowledge and tools, while also improving employees' digital skills and adaptability, indirectly contributing to marketing performance. At this Bank, the implementation of integrated learning systems has directly improved marketing capabilities through continuous skill development and knowledge updates. Concurrently, it has enhanced employees' ability to adapt to new digital tools and technologies, enabling them to apply newly acquired knowledge more effectively in their marketing strategies, thus indirectly improving overall marketing capabilities. The learning systems have fostered a culture of continuous digital upskilling among this Bank's marketing staff, leading to more innovative and data-driven marketing approaches. This dual impact of integrated learning systems highlights their crucial role in developing a digitally adept marketing workforce capable of navigating the rapidly evolving digital banking landscape.

5. Conclusions

This study has successfully addressed its two primary objectives, providing valuable insights into the role of digital technologies in enhancing marketing capabilities within the banking sector, specifically at One of the state-owned banks in North Sumatra.

Key Findings

1. Influence of Digital Technologies on Marketing Capabilities: The research confirms that AI, Big Data Analytics, Omnichannel platforms, IoT, and integrated learning systems all positively and significantly influence marketing capabilities in banking. These technologies collectively contribute to improved customer segmentation, personalized marketing strategies, data-driven decision-making, and enhanced customer experiences across various channels.
2. Mediating Role of Employee Digital Adaptability: The study reveals that employee digital adaptability partially mediates the relationship between the examined technologies and marketing capabilities. This indicates that while these technologies directly enhance marketing capabilities, they also indirectly improve them by increasing employees' ability to adapt to and effectively utilize digital tools and platforms.

Implications

1. Technological Integration: The findings underscore the importance of integrating advanced digital technologies in banking operations to enhance marketing capabilities and maintain competitiveness in the digital era.
2. Employee Skill Development: The mediating role of employee digital adaptability highlights the critical need for continuous digital upskilling and reskilling of marketing staff to maximize the benefits of technological investments.
3. Holistic Digital Transformation: The collective influence of various technologies suggests that a comprehensive approach to digital transformation is more effective than isolated technological implementations.

Recommendations

1. Strategic Technology Investment: this Bank should prioritize investments in AI, Big Data Analytics, Omnichannel platforms, IoT, and integrated learning systems, ensuring these technologies are well-integrated into their marketing operations.

2. Enhanced Digital Training Programs: Develop and implement comprehensive digital training programs for marketing employees, focusing on both technical skills and adaptive mindsets to improve digital adaptability.
3. Cross-functional Collaboration: Encourage collaboration between marketing, IT, and HR departments to ensure that technological implementations are aligned with employee capabilities and organizational goals.
4. Continuous Assessment and Adaptation: Regularly assess the impact of digital technologies on marketing capabilities and employee adaptability, and be prepared to adapt strategies based on these assessments.
5. Customer-Centric Approach: Leverage the enhanced marketing capabilities to develop more personalized, timely, and relevant customer experiences across all banking channels.
6. Data Governance and Ethics: Implement robust data governance frameworks and ethical guidelines to ensure responsible use of customer data in marketing initiatives.

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