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Bridging the Gap: Enhancing Financial Sustainability through Fintech Adoption, Financial Literacy, and the Mediating Role of Digital Leadership

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ABSTRACT

Purpose: This study aims to establish the interconnection between Digital Leadership, Financial literacy, financial sustainability, and fintech adoption, with a focus on how these constructs interact in an organizational setting, specifically regarding improving leadership and financial performance.

Design/Methodology: This study applied a quantitative research design whereby a structured questionnaire was used to collect data from respondents in different business sectors. Regression analysis, alongside hypothesis testing using T-statistics and P-values, was used to determine the coefficients of the relationships between the constructs.

Findings: The results indicate a significant positive correlation between the constructs. Financial Literacy increases both Digital Leadership and Financial Sustainability while Fintech Adoption largely raises Digital Leadership and has a moderate effect on Financial Sustainability. The research proves that high levels of Digital Leadership are strongly connected with levels of Financial Sustainability, thus proving the link between these two organizational constructs.

Research Limitations/Implications: A cross-sectional study design did not capture the developmental processes of the constructs. Future research should consider longitudinal studies to observe changes and developments as organizations progress in their digital journeys. Studying these constructs in other industries may provide more information about how useful the models are in different settings.

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Introduction

Over the past few years, there has been rapid development of financial technology, or fintech,

which has revolutionized the financial platform and brought in a new age of efficiency and opportunity (Cetindamar et al., 2024). With the increase in solutions offered through the use of fintech, the public is not only going to see the improvement of the ease of financial transactions but also the availability of such services (Rehman & Mia, 2024). It is imperative to note that despite the crucial advantages, the use of fintech services is still quite varied and not uniform across the population and regions (Informasi et al., 2024). There is a dire need to examine the relationship between the use of fintech, financial literacy, and financial sustainability, as well as ascertain the relevance of digital leadership in responding to these issues (Restu Millaningtyas et al., 2024). Fintech is believed to have a positive impact on the process of financial inclusion, particularly in societies that are not very developed (Mavlutova et al., 2023).

Through the use of online technologies, people and enterprises can receive the necessary financial services and products that were previously unobtainable (Koskelainen et al., 2023). However, the success of these innovations depends on the user's capacity to manage them, and hence, the significance of financial literacy (Suparno et al., 2023). The level of financial knowledge is the individual's ability to make rational decisions regarding finances and is one of the key factors that determine the extent to which people can harness and benefit from the opportunities offered by Fintech solutions (Munir et al., 2023). Even the most innovative and high-level financial technologies, if the basic financial concepts are not fully understood, will not deliver the intended results of helping users avoid detrimental financial decisions and result in financial instability (Krajčík et al., 2023). Another area that is most affected by the relationship between fintech and financial literacy is financial sustainability, which ensures the organization's long-term financial health, including the steady growth of a company's net income, strong returns on investments, and growing cash balance (Hasan et al., 2023). As Fintech solutions offer new ways to manage, invest, and save money, the question arises: how can members of society make sure that these technologies are beneficial to their financial security in the long run, instead of being a hindrance? To answer this question, it is necessary to look at how fintech can be managed and developed through proper means of digital management (Luo et al., 2022).

Digital leadership, as the capacity to engage others in the pursuit and use of digital technologies, has become a critical factor in addressing fintech and financial literacy issues (Farias-Gaytan et al., 2022). Policymakers and business leaders in the Fintech industry are responsible for helping users successfully apply relevant technologies (Seldal & Nyhus, 2022). In this regard, a proper analysis of the digital leadership approach signifies that it is possible to develop further initiatives aimed at increasing the financial literacy of the population, the proper usage of fintech, and sustainable financial conditions (Frimpong et al., 2022). It embraces not only the promotion of innovative technologies, but also the preparation of users for the new world in which they will face numerous challenges in the financial sector (Setiawan et al., 2022). Therefore, this study examines the following relationships: Fintech adoption, financial literacy, financial sustainability, and digital leadership mediation (Kass-Hanna et al., 2022). This study aims to establish the effect of digital leadership in mediating the relationship between fintech adoption and financial literacy and understand the moderating effects of the variables under analysis on financial sustainability (Firmansyah & Susetyo, 2022). The study draws upon literature review, case investigations, and, where possible, quantitative evidence to map out the mechanisms by which digital leadership can promote fintech, increase people's appreciation of financial matters, and encourage sustainable financial wellbeing (Al-Okaily et al., 2021). The relevance of this study is that it provides practical recommendations to financial industry stakeholders (Vergara & Agudo, 2021).

It would be valuable for policymakers to learn the ways in which it is possible to develop and promote fintech solutions' usage and financial literacy (Monteiro & Leite, 2021). Financial institutions and players in the fintech sector can obtain insights into how to improve the relevance of their services to different classes of users (Lyons & Kass-Hanna, 2021). Researchers and

practitioners can use it to establish educational interventions that strengthen individuals' financial management and the responsible use of fintech products (Cho & Park, 2021). Therefore, to narrow the gap between fintech adoption, financial literacy, and financial sustainability considering the lack of effective digital leadership, this research will offer its input towards positively influencing financial literacy, helping fintech organizations to become more sustainable, and thus presenting stakeholders with a better and more inclusive financial ecosystem (Pierri & Timmer, 2021).

Therefore, while there is a dissenting implementation of fintech solutions, it results in varying financial literacy as well as making financial sustainability difficult. Concerning the effect of digital leadership in moderating these problems, the current understanding is limited, which hinders efforts towards devising solutions. This study attempts to solve this problem by investigating how digital leadership determines the relationship between fintech adoption and financial literacy and its cumulative effect on financial sustainability. The purpose of this research is to examine a range of research questions concerning the contribution of digital leadership and to establish ways to improve its performance to foster financial sustainability.

This research is useful because it focuses on a topic that is relevant but has not received the attention it should, which examines the interdependence between fintech and the adoption of financial literacy and the effects that these elements have on financial sustainability, all of which play core roles in the current economy. Therefore, examining the existence of the digital leadership connection between these concepts, this study provides information on how leadership approaches will improve value. Information about these dynamics will help local and national authorities, financial institutions, and others to create better strategies and enhance the utilization of fintech solutions and financial literacy in the future.

Literature Review

Fintech Adoption and Financial Sustainability

According to Nurohman et al. (2021), financial technology refers to all innovative breakthroughs in the contemporary world's financial industry, including mobile money, Bitcoins, P2P lending, and robo-advisors. The use of these technologies provides significant opportunities for increasing financial sustainability; however, they also create various new issues (Faqih & Aziz, 2021). An organization's capacity to sustain its financial well-being in the long run is known as its financial sustainability. This involves generating enough income to cover operational costs, fulfilling financial commitments, and supporting future expansion without depending on unreliable or unsustainable funding sources (Weerawardena et. al., 2010). Organizations that are financially sustainable typically have robust and varied income sources, implement effective financial management strategies, and possess adaptability to respond to shifts in economic conditions.

According to Mahmood et al. (2021), the concept of fintech involves the enhancement of financial sustainability through the use of technology to deliver efficient, reliable, and transparent financial systems. In general, such solutions benefit customers by providing them with easy and powerful tools to handle money, savings, and investments (Azeez & Akhtar, 2021). For instance, mobile banking applications and digital wallets enable users to monitor their expenditures, set expenses, and make transactions, thereby enhancing their financial status and well-being (Cetindamar Kozanoglu & Abedin, 2021). Similarly, automated investment services are commonly referred to as robo-advisory services, which provide investment recommendations to users on how they can grow wealth in the long run (Winarsih et al., 2020). According to Arner et al. (2020), fintech solutions can act as a tool to decrease expenses and increase the efficiency of operations with the help of well-planned financial decisions. Technologies such as blockchain can enhance the effectiveness and security of transactions, as well as the tools of data analysis that can help analyze financial outcomes and tendencies (Vučinić, 2020). By using these efficiencies, there can be better decision-making regarding resource use and, hence, better financial sustainability (Musabegović

et al., 2019). However, it has been found that being a user of fintech means defying financial sustainability in a way (Khakwani et al., 2024). It is crucial to note that fintech solutions' implementation depends on several characteristics such as the users' level of financial literacy, quality and security of the technology, and the overall economic conditions (Cetindamar et al., 2024). This means that, for instance, the effective application of specific streaming instruments as a part of fintech will remain unattainable because of the lack of appropriate financial perception and, as a consequence, probable unsound financial choices and vulnerability (Rehman & Mia, 2024). For instance, people who invest their money in automatic trading solutions do not understand the prospects of losing their investments (Informasi et al., 2024). According to Restu Millaningtyas et al. (2024), the main issues arising from the nature of IT are the instability and volatility of the technologies that dominate the sector, and that their rate of evolution can be swift. With continuous development and innovation of the Fintech solutions, it may also come with new complexities like new risks that may range from cybersecurity, risks that arise from regulatory policies among others (Mavlutova et al., 2023). Financial sustainability depends not only on the implementation of new technologies, but also on adequate control and additional legislation that will help avoid negative consequences (Koskelainen et al., 2023). Based on the above literature, the following hypothesis is proposed.
H1: Fintech adoption has a positive and significant relationship with financial sustainability.

Financial Literacy and Financial Sustainability
According to Suparno et al., 2023) financial literacy and financial sustainability are symbiotic and presupposed, since financial literacy serves as the foundation on which sustainable finances are created. The concept of financial literacy is defined as an individual's competence in making the right financial decisions enabling him or her to allocate, protect, and invest their money in the right manner (Munir et al., 2023). This enables a person to practice good personal financial management, which has a significant impact on his/her financial future (Krajčík et al., 2023). According to Hasan et al. (2023), financial literacy helps create proper user behavior, including the formation of financial plans and necessary forecasts, such as budgeting, savings for pension age and insurance, investments, etc., in this way, people can be aware of these instruments and the key terms, thus avoiding such crucial mistakes as taking too much debt or managing an investment ineffectively, which negatively impacts financial sustainability (Luo et al., 2022). For Instance, it is easier for informed people to equally empower themselves economically by saving and investing to have a sound financial future and protect against future economic shocks (Farias-Gaytan et al., 2022).

According to Seldal and Nyhus (2022), poor financial literacy is likely to negatively affect financial sustainability. Poor financial education can result in poor money handling, such as poor control of debts, inadequate savings, and poor investment, leading to eternal money troubles (Frimpong et al., 2022). They may thereby make wrong decisions on borrowing high-interest-bearing loans or investment-related wrong decisions that are catastrophic to them in the long run (Setiawan et al., 2022). According to Kass-Hanna et al. (2022), financial literacy largely impacts financial sustainability in society. This means that, when large segments of the population are financially literate, their financial position, as well as that of the economic platform in general, is likely to be stable and healthy (Firmansyah & Susetyo, 2022). Banking enablement of the population increases economically responsible behaviors and thus decreases the occurrence of financial economic crises (Al-Okaily et al., 2021). Vergara and Agudo (2021) state that financial literacy is one of the key factors in financial sustainability because it enables an individual to obtain the necessary knowledge and make adequate decisions that retain financial stability in the future. Based on the above literature, the following hypothesis is proposed.
H2: There is a positive and significant relationship between financial literacy and sustainability.

Fintech Adoption and Financial Sustainability with Mediating effect of Digital Leadership
According to Monteiro and Leite (2021), the roots of Fintech adoption, the achievement of financial

sustainability, and the role of digital leadership lie at the heart of the matter as to how innovative technological solutions may cause shifts in balance that will impact economic stability and future development. The main purpose of fintech is to provide innovative ways of improving the processes of managing, accessing, and utilizing finances (Lyons & Kass-Hanna, 2021). These technologies can foster operational and cost efficiency in financial systems, resulting in financial sustainability (Cho & Park, 2021). Although the cooperative area has profited from it and sustainable finance can be achieved by fintech, it has its conditions: digital leadership (Pierri & Timmer, 2021). According to Nurohman et al. (2021), digital leadership fulfills the mediating function of fintech use, richness, and financial viability. Digital leaders are, therefore, required to oversee the application of fintech technologies to optimize their use to cater to a firm's goals (Faqih & Aziz, 2021). In particular, they play a vital role in creating a climate for synchronizing fintech innovations with current financial mechanisms (Mahmood et al., 2021). According to Azeez and Akhtar (2021), in the context of applying financial sustainability, leaders of fintech firms should consider it necessary not only to promote technologies but also to solve the issues related to them at the same time. This includes user financial literacy, where the focus is imposed on the ability of individuals to best deal with fintech applications (Cetindamar Kozanoglu & Abedin, 2021). Organizational executives can also encourage training and educational endeavors to increase users' awareness of how to fully leverage new technologies (Winarsih et al., 2020). According to Arner et al. (2020), digital leadership requires the coordination of a company's efforts to design effective risk management frameworks that may help avoid some of the negative effects of using fintech – for example, severe cases of cyber threats or problems with regulators. Through such risks, digital leaders can ensure financial stability by ensuring safe digital platforms for carrying out transactions (Vučinić, 2020). According to Musabegović et al. (2019), financial sustainability is one of the most promising areas that have benefited from the Fintech phenomenon; nonetheless, leadership in this process depends on digital factors. Good leadership is crucial because it leads to proper implementation of Fintech solutions, users' awareness of the technology applications, and, more noteworthy, risk control for the financial systems' sustainability and growth (Khakwani et al., 2024). Based on the above literature, the following hypothesis is proposed.

H3: There is a positive and significant relationship between Fintech Adoption and Financial Sustainability, with the mediating effect of Digital Leadership.

Financial Literacy and Financial Sustainability with Mediating Effects of Digital Transformation

According to Khakwani et al. (2024), digital transformation offers significant mediation between financial literacy and the level of financial sustainability. Financial literacy refers to the amount of knowledge and skills required to make efficient financial decisions, which are crucial for ensuring that sustainable financial status is achieved in society (Musabegović et al., 2019). It involves the ability to make decisions concerning spending, saving, and other financial risks; thus, it plays a crucial role in enhancing people's financial well-being (Faqih & Aziz, 2021). According to Lyons and Kass-Hanna (2021), digitalization, which is the implementation of digital technologies in all functional units of financial management, can increase the efficiency of financial literacy activities. With the help of financial applications, websites for budgeting, and investment applications, people can use their knowledge in a given field more effectively (Kass-Hanna et al., 2022). These application technologies enable improved tracking of expending, successful management of investments, and smarter decision-making, thereby enhancing financial sustainability (Luo et al., 2022). According to Rehman and Mia (2024), digital transformation also creates a connection with financial self-education and tools that eliminate gaps in financial literacy. Tutorials, financial calculators, and other animated applications from the sphere of social life extend financial knowledge and make it as practical as online platforms and various apps (Azeez & Akhtar, 2021). This accessibility guarantees that innovative digital instruments of superior personal finance are available to those who may have a lower level of financial literacy (Setiawan et al., 2022). According to (Monteiro & Leite, 2021) the use of digital means is described as an effector which

increases the transparency of the financial activities, thus, giving people more control over their financial decisions. For example, in the case of, digital banking services offer the ability to monitor the users' expenses and savings, following their plans and objectives within the field of sustainability (Krajčík et al., 2023). According to (Mavlutova et al., 2023) it can be stated that despite the fact that financial literacy plays a decisive role in attaining financial sustainability, digitalization acts as a multiplier factor to it. Computing devices and ICT not only facilitate the use of acquired financial literacy but also contribute to proficiency in financial education, strengthening financial control, and long-term financial stability (Millaningtyas et al., 2024). Based on the above literature, the following hypothesis is proposed.

H4: There is a positive and significant relationship between Financial Literacy and Financial Sustainability with the mediating effect of Digital Transformation.

Digital Leadership and Financial Sustainability

According to Munir et al., 2023) this flow makes digital leadership an effective mediator in promoting financial sustainability, because it also involves the management of technology in organizations and financial structures. Every day, more technological features are introduced in financial management systems, which is why digital leaders are crucial so that technological advancements are adopted in the best manner possible to promote sustainable financial development (Firmansyah & Susetyo, 2022). According to Cho and Park (2021), digital leadership is more than just the introduction of technology tools and proper deployment of technology to develop the necessary technology infrastructure, which entails a strategic vision of how to apply technology to enhance the management of organizational financial performance and improve financial resilience. Digital leaders must actively implement and promote the use of advanced financial technologies, such as blockchain, artificial intelligence, and data analytics, while prioritizing the organization's objectives, including the attainment of financial sustainability (Hasan et al., 2023). This is due to the fact that when leaders outline a strategy and a vision for going digital, they can efficiently help improve financial processes, assist with the decision making process and hence help stabilise the financial department (Koskelainen et al., 2023). According to Informasi et al. (2024), digital executives are responsible for risks related to the digital transformation process. They are in charge of putting measures in place to protect the organization against cyber threats, protect personal data, and deal with any relevant laws (Frimpong et al., 2022). Thus, digital leaders' timely identification and mitigation of such risks work to prevent threats to the integrity of financial systems and to strengthen financial stability (Seldal & Nyhus, 2022). Additionally, digital leaders are important in change management processes, which include the encouragement of learning and embedding changes in an organization (Vučinić, 2020). About this, they advocate for the efficient training of clients, employees and all stakeholders in order to be able to harness these new technologies hence improving on the general Fintech literacy and capacity (Nurohman et al., 2021). This investment in human capital confirms that with the adoption of digital innovations, all advantages will be realized and that the organization is ready for changes in the financial environment (Khakwani et al., 2024). Based on the above literature, the following hypothesis is proposed.

H5: Digital leadership has a positive and significant relationship with financial sustainability.

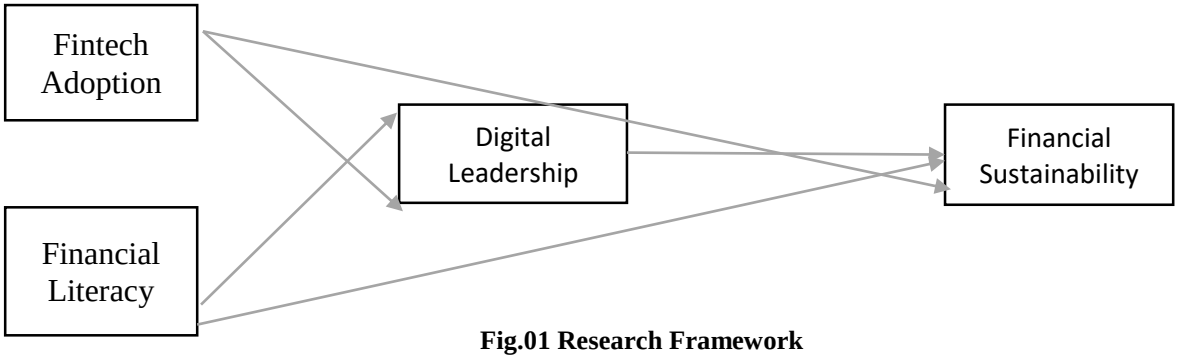

Fig.01 Research Framework

Material and Methods

Research Design

This study uses a quantitative research approach to examine the role of digital leadership as a moderator of the relationship between fintech adoption, financial literacy, and financial sustainability (Khakwani et al., 2024). The goal-oriented approach of the research methodology allows for the accurate and detailed identification of the factors through the use of a structured questionnaire (Munir et al., 2023). It allows for the elaboration of clear conclusions that reveal how digital leadership affects the relationships between the variables of fintech adoption, financial literacy, and financial sustainability.

Research Instrument Measurement

Digital Leadership evaluates the effectiveness in two areas. The ability to lead a Digital Agenda, level of awareness, strategic input, confidence in the use of digital tools, and support for innovation (Erhan et al., 2022). Financial Literacy checks inflationary expectations, rates of interest, and various financial services–one's ability to go through a financial decision-making improvement process (Mutlu & Özer, 2022). Financial Sustainability assesses organizational resource readiness for continuous positive stability, commitment to financial wealth, risks, and overall strategic planning (Mwenda et al., 2023). Fintech Adoption assesses the level of financing technology, focusing on the realization of the degree of understanding, readiness, and integration of Fintech improvements in the enhancement of financial processes (Aloulou et al., 2024).

Construct	Item	Source
Digital Leadership	04 Items	(Erhan et al., 2022)
Financial Literacy	05 Items	(Mutlu & Özer, 2022)
Financial Sustainability	04 Items	(Mwenda et al., 2023)
Fintech Adoption	07 Items	(Aloulou et al., 2024)

Data Collection

The study acquires data through a structured questionnaire from people in organizations that are members of Fintech adoption and financial literacy, operating within the industrial estate zones in Pakistan. The total number of respondents who participated in the survey was 330, and they were screened based on the company's interaction with Fintech, the relevance of digital leadership theories, and strategies that endorse financial viability. Convenience sampling is also used so that the study would cover a broad range of professionals from different sectors. Participants completed the data collection online using Google Forms, which explained the purpose of the study, the role of participants, and the measures taken to protect participants' information. The survey questions were timed to allow respondents a certain number of days to complete the survey, and gentle reminders were sent to complete the survey.

Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) and partial least squares structural equation Modeling (PLS-SEM) (Khakwani et al., 2024). First, a descriptive analysis method was used to present the characteristics of the sample, such as demographic characteristics and other related factors. Descriptive analysis was employed to ascertain the degree of association between the following variables: fintech adoption, financial literacy, digital leadership, and financial sustainability. Multiple regression analysis was then performed to determine the main effects of these variables and test the mediating effects of digital leadership on these relationships. This approach enables us to establish an understanding of how digital leadership affects the relationship between fintech adoption, financial literacy, and sustainable financial performance.

Analysis and Results

This section discusses the correlations between major constructs: Digital Leadership, Financial Literacy, Financial Sustainability, and Fintech Adoption in the context of the developed theory. Hypothesis testing allows us to measure the strength and significance of such relationships using coefficients, T-statistics, and P-values based on statistical methods (Mahmood et al., 2021). The presented results are essential for identifying the interdependencies of these variables in business settings and using them in practice to address the challenges of digital transformation, financial literacy, and the effective integration of financial technologies. The findings not only support the theoretical framework of the present research, but also provide insights into the processes that are essential for effective leadership and responsible financial management in the modern digital environment.

Table 01 Demographic analysis

Demographic Questions	Description	Frequency	Percentage
1. Gender	Male	153	63.7%
	Female	87	36.3%
2. Age	Between 20-35	202	84.2%
	Between 36-50	23	9.6%
	Above 50	15	6.3%
3. Experience	Less than 5 Years	124	51.7%
	Less than 10 Years	43	17.9%
	Less than 15 Years	53	22.1%
	More than 15 Years	20	8.3%
4. Level of Education	Diploma	19	7.9%
	Intermediate	76	31.7%
	Bachelors	73	30.4%
	Masters	42	17.5%
	Other	30	12.5%
4. Position	Supervisors	69	28.7%
	Middle Level Managers	117	48.8%
	Top Level Managers	54	22.5%

The demographic breakdown shows that the sample population comprises 240 people and is highly uneven in terms of some categories. The sex distribution was mainly male, with 63.7% of the participants, while females accounted for 36.3%.

The age data points out that the majority of the clients are young; approximately 84.2% of the respondents were between 20 and 35 years of age, which implies a relatively young workforce, possibly at the early stages of their careers. This is true according to the experience breakdown, whereby 51.7% of the participants agreed that this notion had less than 5 years of experience and 8.3% had more than 15 years of experience.

The population is well-educated, predominantly having higher education, and a significant number of people have at least a bachelor's degree. Specifically, 30.4% had achieved a bachelor's degree, and 17.5% of the respondents had attained a master's degree, indicating that the workforce was educated.

This work position data presents a structural hierarchy with 28.7% supervisors, 48.8% middle-level managers, and 22.5% top-level managers, meaning that respondents are randomly spread over organizational levels but contain many people in middle management positions.

This structure indicates an organization with a large part of manpower who must be involved in managerial and supervisory duties, which is supported by the level of professionalism that is anchored in professionalism despite the young age of most employees.

The Measurement Model

Table 02 Factor Loading Outer Model

	Digital Leadership	Financial Literacy	Financial Sustainability	Fintech Adoption
DL1	**0.869**			
DL2	**0.872**			
DL3	**0.876**			
DL4	**0.845**			
FA1				**0.789**
FA2				**0.856**
FA3				**0.805**
FA4				**0.828**
FA5				**0.789**
FA6				**0.838**
FA7				**0.770**
FL1		**0.749**		
FL2		**0.801**		
FL3		**0.822**		
FL4		**0.873**		
FL5		**0.875**		
FS1			**0.799**	
FS2			**0.861**	
FS3			**0.577**	
FS4			**0.420**	

FA= Fintech Adoption, FL= Financial Literacy, DL= Digital Leadership, FS= Financial

Sustainability

Table 02 shows the results of the measurement model for the relationships among digital leadership, financial literacy, financial sustainability, and fintech adoption. The degree of association between each measured variable and the corresponding latent factor is indicated by factor loadings, which can also be used to determine the goodness of the constructs in terms of the model.

Digital Leadership: Items DL1 to DL4 demonstrated satisfactory factor loadings, ranging from 0.845 to 0.876. These high loadings indicate that the indicators above are highly reflective of the digital leadership construct; therefore, the measure is reliable in the context of this model (Munir et al., 2023). The high level of cross-loading shows that the construct is consistent, which might be crucial when it comes to leadership in technologically advanced organizations.

Financial Literacy: The other indicators FL1 through FL5 also have high loadings ranging from 0.749 to 0.875, with FL4 and FL5 having the highest loadings. This implies that these aspects of financial literacy are well-developed and applicable within the model, which may be due to the key components of financial literacy and essentials needed in the modern economy (Khakwani et al., 2024).

Financial Sustainability: The loadings of the financial sustainability indices (FS1 to FS4) have higher variations, ranging from 0.420 to 0.861. This also indicates that the items that load less (i.e., FS3 and FS4) may not be efficient in measuring the construct or that there are different dimensions of financial sustainability that are not equally well captured by this model (Faqih & Aziz, 2021).

Fintech Adoption: Items FA1 to FA7, concerning fintech adoption, indicate loadings that range from 0.770 to 0.856, which clearly shows a strong reflection of the fintech adoption construct. It is evident that these constant and high values hinge on the correlation between these indicators and the use of fintech. The outer model shows the factor loadings of the items from the current study; for the most part, all items are good indicators of their assigned construct, with some degree of deviation in financial sustainability. This could be due to the variation in the economic status of the different countries or other factors that were not captured in the model and would require more research or modification of the model so that all relevant variables are captured correctly.

R-Square and Adjusted R-Square

Table 03 R-Square and Adjusted R-Square

	R Square	R Square Adjusted
Digital Leadership	**0.784**	**0.782**
Financial Sustainability	**0.563**	**0.557**

Table 03 displays the R-square and adjusted R-square values for Digital Leadership and Financial Sustainability. It can be observed that Digital Leadership has a very high R-square value of 0.784, and an adjusted R-square of 0.782 of the total amount of variance in Digital Leadership accounted for by the model or about 78.2% was explained, while the penalty for the number of predictors was relatively low (Mahmood et al., 2021).

This indicates a high level of compatibility and significant ability of the model to explain this construct. However, the results for Financial Sustainability are smaller, with values of 0.563 for the R-square and 0.557 for the adjusted R-square, accounting for approximately 56.3% of the variance of the independent variables (Munir et al., 2023). This provides a moderate level of fit, meaning that other variables outside the proposed model might affect Financial Sustainability.

Construct Reliability and Validity

Table 04 Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital Leadership	**0.889**	**0.891**	**0.923**	**0.749**
Financial Literacy	**0.882**	**0.885**	**0.914**	**0.681**
Financial Sustainability_	**0.619**	**0.708**	**0.770**	**0.472**
Fintech Adoption	**0.913**	**0.914**	**0.931**	**0.658**

Table 04 outlines the reliability and validity measures for four constructs: The following are the clusters Digital Leadership, Financial Literacy, Financial Sustainability, and Fintech Adoption. Cronbach's alpha (rho_A), Composite Reliability, and Average Variance Extracted (AVE) were used to assess the constructs.

The results of the reliability and validity of Digital Leadership present strong and positive indicators, with Cronbach's alpha and rho_A being around 0.891; thus, the Composite Reliability of 0.923 and for AVE, it was found to be 0.749 (Khakwani et al., 2024). These high values prove high internal consistency, and a considerable portion of the variance is accounted for by this construct; therefore, construct reliability and validity can be considered high.

Financial Literacy also showed satisfactory reliability; the values of Cronbach's alpha and rho_A were close to 0.882, and the Composite Reliability was 0.914. The AVE at 0.681 is also reasonable, which means that the validity of the construct is justified, as it can encompass the core idea of financial literacy successfully (Faqih & Aziz, 2021).

Financial Sustainability is slightly less reliable and valid than the other factors, with a Cronbach's alpha of 0.619 and AVE of 0.472, both of which are below the generally accepted norm, while rho_A and Composite Reliability are slightly higher, indicating certain inconsistencies in the extent to which the items reflect the construct (Millaningtyas et al., 2024). Reliability analysis shows that all the values for Fintech Adoption are above 0.913, and the study has very high reliability, with all the values being very close to 0.914 and an AVE of 0. 658, which means that the internal consistency is high, and an adequate amount of variance is described by the construct (Firmansyah & Susetyo, 2022).

In general, most constructs are clear and valid, although some ambiguities still appear in the measurement of Financial Sustainability, indicating that the measures of this construct could need reconsideration or model improvements.

Discriminant Validity

Table 05 Fornell-Larcker Criterion

	Digital Leadership_	Financial Literacy	Financial Sustainability_	Fintech Adoption
Digital Leadership	**0.866**			
Financial Literacy	**0.865**	**0.825**		
Financial Sustainability_	**0.718**	**0.721**	**0.687**	
Fintech Adoption	**0.851**	**0.881**	**0.706**	**0.811**

Table 05 presents the Fornell-Larcker criterion to evaluate discriminant validity among the four constructs: Digital Leadership, Financial Know-how, Financial Viability, and Fintech Conversion. Discriminant validity establishes whether variables that are not expected to be truly related are related (Vučinić, 2020). The diagonal of this table is the square root of the AVE for each construct, which, according to the Fornell-Larcker criterion, should be higher than the off-diagonal elements in its row and column.

This ensures that a construct has more communality with its indicators than with the other constructs. The digital Leadership diagonal value of the linear correlation coefficient, r, was 0.866, which is slightly higher than the correlation between Financial Literacy and Financial Sustainability (r= 0.865) and Fintech Adoption (r= 0.851). This shows acceptable discriminant validity because the value for the discriminant validity should be equal to or greater that 0.7 (Hasan et al., 2023).

Financial Literacy has a diagonal value of 0.825, which is slightly lower than the correlation coefficient with Digital Leadership of 0.865, but higher than that with Financial Sustainability of 0.721 and Fintech Adoption of 0.881. The diagonal value of Financial Sustainability is 0.687, which is rather low compared to the coefficients obtained for Digital Leadership and Financial Literacy (0. 718 and 0.721 correspondingly) (Cetindamar Kozanoglu & Abedin, 2021).
The diagonal value of Fintech Adoption is 0.811, which is lower than the correlation coefficient between the current study's measure of Financial Literacy (0.881), which suggests discriminant validity between the two constructs.

In general, it can be stated that a number of examined constructs reveal satisfactory levels of discriminant validity; however, the level of discriminant validity between Financial Literacy and both Digital Leadership and Fintech Adoption, as well as between Financial Sustainability and the rest of the investigated constructs can be considered questionable (Azeez & Akhtar, 2021).

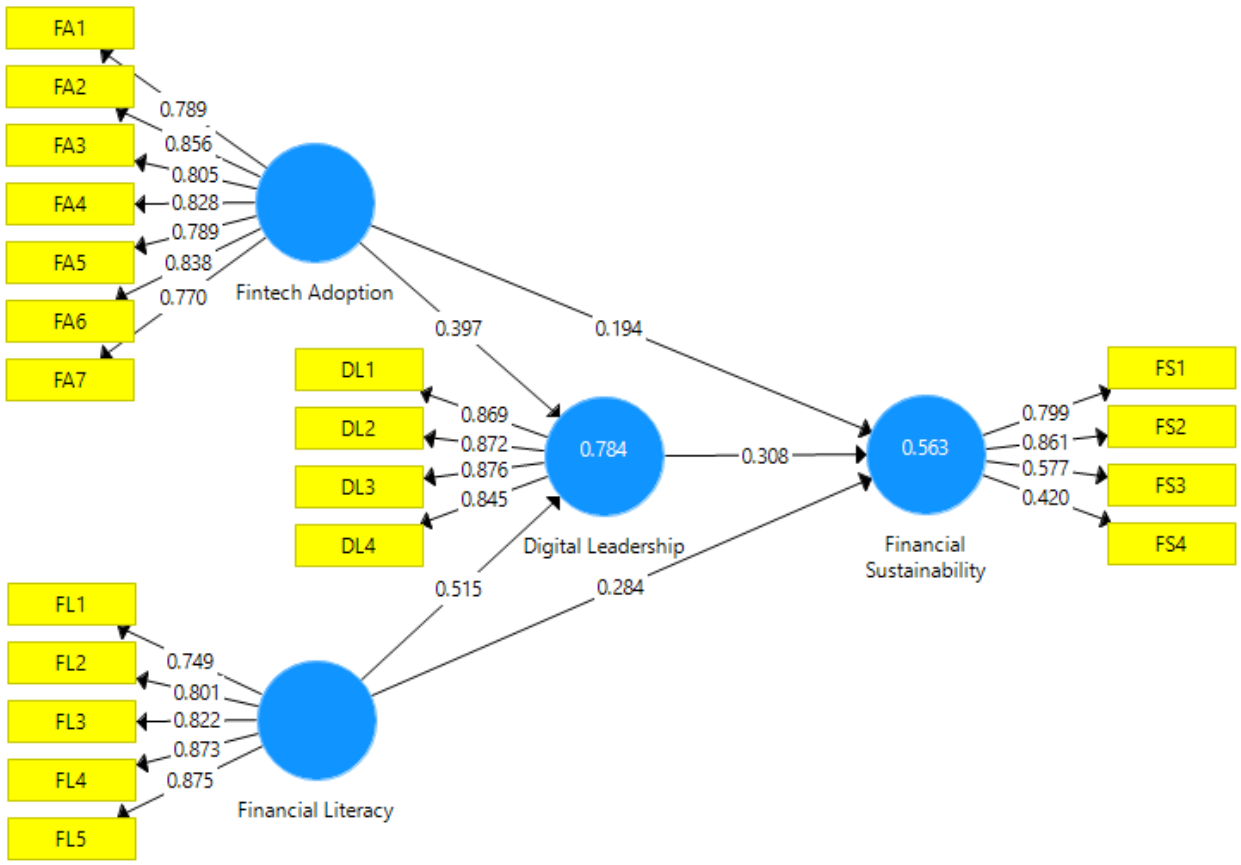

Fig.02 PLS-SEM Framework

Testing of Hypothesis

Table 06 Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Digital Leadership_ -> Financial Sustainability_	0.308	0.301	0.091	3.364	**0.001**
Financial Literacy -> Digital Leadership_	0.515	0.515	0.092	5.590	**0.000**
Financial Literacy -> Financial Sustainability_	0.284	0.289	0.089	3.202	**0.001**
Fintech Adoption -> Digital Leadership_	0.397	0.395	0.089	4.474	**0.000**
Fintech Adoption -> Financial Sustainability_	0.194	0.191	0.087	2.229	**0.026**

Table 06 provides the statistical results for testing the hypotheses linking various constructs: digital leadership, financial literacy, financial sustainability, and fintech adoption. These are the original sample coefficients, sample means, standard deviations, T-statistics, and P-values for each hypothesis shown in the table. Digital Leadership to Financial Sustainability: In the case of the original sample, the coefficient was equal to 0.308, showing that there is a positive association between them, with a t-statistic of 3.364 and a P-value of 0.001, which indicates that the hypothesis is accepted (Rehman & Mia, 2024). This relationship is statistically significant, indicating that a higher level of Digital Leadership has a positive impact on Financial Sustainability (Arner et al., 2020).

Financial Literacy to Digital Leadership: As this hypothesis demonstrates, the coefficient is rather high, being 0.515 for a positive value, T-statistic equal to 5.590, and p-value of 0.000, which clearly

supports the hypothesis that Financial Literacy greatly contributes to the improvement of Digital Leadership. The stability of the results is supported by the similarity between the original sample and the sample mean, as both are 0.515 (Winarsih et al., 2020). Financial Literacy to Financial Sustainability: Here, a coefficient of 0.284 with a T-statistic equal to 3.202 and a level of significance equal to P-value = 0.001 The analysis carried out shows that Financial Literacy has a positive and considerable impact on Financial Sustainability. This relationship is statistically significant, stressing the role of financial literacy in fostering proper financial behavior. Fintech Adoption to Digital Leadership: As the coefficient was equal to 0.397, the result reveals a positive influence of Fintech Adoption on Digital Leadership. The T-statistic of 4.474 and the P -value of 0.000 show that there is a positive connection, which in turn means that adopting the Fintech strategy can improve leadership in the digital sphere by several notches (Rehman & Mia, 2024). Fintech Adoption to Financial Sustainability: The coefficient of 0.194, which is less than the other values, also shows a positive correlation with the T-statistic, equal to 2.229, and the P-value is equal to 0.026 (Vergara & Agudo, 2021). This result implies that although Fintech Adoption has a positive relationship with Financial Sustainability, it is less significant compared to Digital Leadership. In sum, the findings show positive and highly significant correlations between these constructs (Al-Okaily et al., 2021). The data highlight Financial Literacy and Fintech Adoption as the two factors central to strengthening leadership skills and financial fitness. These research outcomes can help formulate future development plans, leadership programs, and financing schemes that include literacy and technology to promote 'organizational health' and overall organizational development.

Conclusion

The detailed discussions presented in this study show the multifaceted relations between Digital Leadership, Financial Literacy, Financial Sustainability, and Fintech Adoption, which underlines the close connection between these constructs for enhancing organizational performance. Statistical data prove the significance of Financial Literacy as a factor that boosts leadership competencies and financial efficiency; the notion that leadership must be educated to manage contemporary economic challenges is stipulated (Luo et al., 2022). Further, Fintech Adoption also shows shifts in Digital Leadership, where organizations need to adopt a digital solution to sustain a competitive edge in a dynamic market environment. Hypothesis 4, testing the impact of Fintech Adoption on Financial Sustainability, shows that although fintech has a moderate positive impact, it is crucial to recognize that technology is a significant driver in contemporary business approaches, but it needs to be optimally incorporated into an organization's strategic plan (Mavlutova et al., 2023). In summary, these results not only support the argument of the present research hypotheses but also underscore the paramount need to promote development in the spheres of education and technology to enhance organizational performance and make the business world more open and productive (Cetindamar et al., 2024). This research clearly points to the fact that the future of leadership effectiveness and organizational success lies in the achievement of financial literacy and innovative use of technology.

Recommendations

Organizations should insist on the recapitulation of financial education across all managerial tiers to improve the company's strategic plan and sustainability performance. In addition, the inculcation of fintech into organizational practices may enhance Digital Leadership, as it fosters more adaptive and knowledgeable leadership in organizations. Promoting conditions for the development and use of fintech can also contribute to financial sustainability in the long term through the optimization of activities.

Future Directions

Future research should also examine the relationship between these constructs as causal variables in different organizations to understand how the characteristics of the organization and the

environment may enhance or weaken the relationships between these constructs. Longitudinal research could provide further understanding of the process of integration of fintech and its impact on the leadership and financial condition of organizations in the long run. Further, research on the part played by novel technologies and educational approaches may help to better understand how leadership can be improved and organizational financial soundness bolstered in a world that is rapidly becoming more digital.

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Appendix, Questionnaire

Code	Items	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Stro Agr
Digital Leadership						
DL1	I am aware of the significance of digital transformation in my organization.					
DL2	I actively contribute to the development of digital strategies in my organization.					
DL3	I am confident in utilizing digital tools to enhance organizational efficiency.					
DL4	I support the adoption of innovative digital solutions in my organization.					
Financial Literacy						
FL1	I know what inflation and interest rates changes mean.					
FL2	I make a price comparison when buying a product or service.					
FL3	I pay attention to the price/performance ratio when buying a product or service.					
FL4	I have knowledge about financial products.					
FL5	I can do anything I put in my mind.					
Financial Sustainability						
FS1	I am committed to ensuring the long-term financial health of my organization.					
FS2	I understand the financial risks associated with my organization's operations.					
FS3	I make decisions that contribute to the financial sustainability of my organization.					
FS4	I am aware of the financial implications of my organization's strategic decisions.					
Fintech Adoption						
FA1	I understand the benefits of adopting Fintech solutions in my organization.					
FA2	I am open to learning about new Fintech technologies.					
FA3	I encourage the use of Fintech solutions to improve financial operations.					
FA4	I believe Fintech adoption can provide a competitive advantage.					
FA5	I stay updated on the latest developments in Fintech.					
FA6	I support the integration of Fintech solutions into our existing systems.					
FA7	I believe that Fintech adoption is essential for future growth.					