The Role of Digital Capabilities and Financial Literacy in Shaping Crypto Investment: A Systematic Review Digital Financial Era

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Abstract. This article aims to examine the role of digital capabilities and financial literacy in shaping crypto investment behavior through a systematic literature review approach. The method used is systematic *literature review based* on the PRISMA protocol, by analyzing 15 articles published in 2018–2024 from various national and international databases. The results of the study show that the combination of digital capabilities and financial literacy significantly shapes rational, adaptive, and risk-resistant investment behavior in the crypto ecosystem. This study produces a conceptual model that places these two variables as the foundation for human resource (HR) transformation in facing the era of decentralized finance (*Decentralized Finance*). Policy implications offered include cross-disciplinary curriculum design and community-based training to enhance community preparedness. Novelty of this article lies in the simultaneous integration of digital capabilities and financial literacy in the context of crypto investment and digital HR transformation, which has not been widely discussed in previous studies.

Keywords: *Digital Capabilities, Financial Literacy, Crypto Investment, HR, Defi.*

INTRODUCTION

The digital revolution has brought about significant changes in the global financial sector, especially with the emergence of blockchain technology and crypto assets that allow financial transactions to be carried out directly without traditional intermediaries. This phenomenon gave birth to the concept of decentralized finance (DeFi), a financial system that operates without a central authority, which fundamentally challenges conventional financial models and opens up new opportunities for wider financial inclusion.

In this context, digital capability and financial literacy are two very crucial aspects for individuals to be able to participate effectively and safely in the crypto investment ecosystem. Digital capability includes the ability to access, understand, and utilize digital technology, including an understanding of blockchain mechanisms, smart contracts, and the use of complex DeFi platforms. Meanwhile, financial literacy involves an understanding of basic financial concepts such as investment risk, portfolio diversification, asset management, and the ability to make wise and informed financial decisions. Digital capability is the ability to utilize digital technology effectively, including in the context of complex crypto investment (Bawden, 2008). Investors with high digital capabilities are able to understand the technical structure of blockchain and avoid cyber threats (Nugroho & Fatimah, 2022). They can read whitepapers, analyze market trends, and manage the security of digital assets through features such as cold storage and two-factor authentication (Hidayat & Salim, 2021).

The rapid development of digital assets in Indonesia has also increased public interest in crypto investment. However, on the other hand, the level of financial literacy and digital capabilities of the Indonesian people is still relatively low, which is a major challenge in dealing with the high risks inherent in crypto investment. Extreme price volatility, lack of comprehensive regulation, and the potential for fraud and technical errors require investors to have a strong understanding both technically and financially in order to manage risk effectively. Many cases of financial losses experienced by novice investors are caused by a lack of

understanding of crypto market mechanisms, the use of security features, and failure to detect increasingly sophisticated fraud schemes.

In addition, the rapid innovation in digital finance requires continuous adaptation from market players. Investors who do not have adequate digital capabilities will have difficulty keeping up with the development of new technologies and features that continue to emerge, such as decentralized exchanges (DEX), yield farming, staking, and various other crypto derivative products. Meanwhile, low financial literacy can lead to speculative, impulsive investment behavior, and lack of consideration of risk management and portfolio diversification aspects.

This study aims to review relevant literature on the relationship between digital capabilities, financial literacy, and crypto investment behavior. In addition, this study proposes a conceptual model of human resource (HR) transformation that can support individual adaptation and readiness in facing a financial system without authority, so as to improve the security, efficiency, and sustainability of crypto investment in Indonesia. The digital revolution in the global financial sector has been marked by the presence of blockchain technology and crypto assets, which enable a financial system without conventional intermediaries through a model*Decentralized Finance*(DeFi). This phenomenon creates both opportunities and challenges, especially in terms of individual readiness to manage risk and make investment decisions independently.

Various empirical studies show that the success of investors in facing the dynamics of the crypto market is not only determined by technical knowledge, but also financial capabilities. Research by Hidayat & Salim (2021) highlights the importance of digital literacy in avoiding cyber threats and understanding technological features such as cold *storage*. Meanwhile, Kristian & Setyawan (2024) underlined the role of financial literacy in avoiding speculative and irrational decisions.

Although digital transformation has revolutionized the financial landscape, academic literature still shows fragmentation in understanding the relationship between digital capabilities and financial literacy. Many previous studies have discussed the two separately, without highlighting the synergistic potential when the two are integrated. This gap becomes even more crucial in the era of Decentralized Finance (DeFi), when technology and finance are converging to form a new paradigm that requires a holistic approach. Ironically, while the industry is rapidly adopting DeFi innovations, academic studies on its impact on human capital transformation are still shallow and fragmented. The lack of a systematic framework that can be implemented in practical policies exacerbates the existing implementation vacuum. This study aims to fill this void by offering an integrative conceptual synthesis of digital capabilities and financial literacy, while deconstructing the synergistic mechanisms of the two in shaping rational investment behavior in the era of decentralized finance.

Novelty of this article lies in the presentation of a conceptual model that synergizes digital capabilities and financial literacy as the main pillars in forming rational crypto investment behavior, as well as a strategy for transforming human resources towards readiness to face a DeFi-based digital economy. The systematic approach used also makes this article have theoretical and practical contributions in the development of more integrated digital financial literacy.

Thus, strengthening digital capabilities and financial literacy is not only an individual need, but also an important strategy in building an inclusive, safe, and highly competitive digital financial ecosystem in today's digital economy era. Support from the government, educational institutions, and industry players is also needed to accelerate the improvement of

community competence, so as to minimize risks, increase public trust, and encourage the growth of a healthy and sustainable crypto market.

LIBRARY STUDY

DIGITAL CAPABILITIES

Digital capability is a set of abilities that enable individuals to access, understand, and effectively utilize digital technology in various aspects of life, both for personal and professional purposes (Bawden, 2008). In the context of crypto investment, digital capability is not only limited to the ability to use hardware and software, but also includes an in-depth understanding of blockchain technology, smart contracts, and how decentralized finance (DeFi) platforms work. Individuals with high digital capabilities can easily navigate various digital wallet applications, crypto exchanges, and identify security features such as two-factor authentication and cold storage. In addition, they are able to utilize various data sources and analytical tools to monitor crypto market developments in real-time, read project whitepapers, and understand the mechanisms of staking, yield farming, and token governance that are increasingly common in the DeFi ecosystem. Strong digital capabilities are also the main bulwark in avoiding various forms of cybercrime, fraud, and phishing attacks that are rampant in the world of digital assets. Investors with good literacy are more critical of information and are able to avoid fraudulent schemes (Kristian & Setyawan, 2024; Ujung et al., 2023).

FINANCIAL LITERACY

Financial literacy is an individual's ability to understand, analyze, and use financial concepts and instruments in making effective and responsible decisions (Lusardi & Mitchell, 2014). In the realm of crypto investment, financial literacy is becoming increasingly important due to the high price volatility, complexity of digital financial products, and the risks inherent in crypto assets. Financial literacy includes an understanding of the principles of portfolio diversification, risk management, fundamental and technical analysis, and knowledge of digital asset regulation and taxation. Investors with good financial literacy tend to conduct due diligence before investing, understand the importance of diversification to minimize risk, and are able to manage expectations regarding potential profits and losses. In addition, financial literacy also helps individuals avoid excessive speculative behavior, understand fraudulent schemes, and anticipate the impact of regulatory changes on their investment portfolios.

CRYPTO INVESTMENT BEHAVIOR

Investment behavior in crypto assets is greatly influenced by a combination of risk perception, level of technical knowledge, and the speed of changing market information (Chen et al., 2020). The lack of these two factors makes investors vulnerable to FOMO and emotional decisions (Rahmawati & Nugroho, 2020). Investors who have good digital capabilities and financial literacy tend to be more careful, rational, and able to control their emotions when facing extreme price fluctuations. They are better able to analyze market trends, read signals from on-chain data, and utilize various technical indicators to determine the optimal time to enter and exit the market. Conversely, the lack of digital capabilities or financial literacy often makes investors vulnerable to impulsive behavior, FOMO (fear of missing out), and are easily influenced by hype or rumors on social media. Empirical studies show that investment behavior based on mature knowledge and analysis tends to produce more stable and sustainable portfolio performance in the long term.

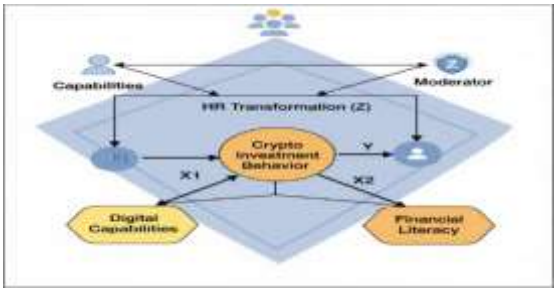
HR TRANSFORMATION IN THE DEFI ERA

The transformation of human resources (HR) in the era of decentralized finance (DeFi) requires the development of new

skills that are relevant to the dynamics of the digital industry. Today's HR is required to have high technological adaptability, data-based decision-making, and flexibility in dealing with non-traditional financial models that continue to develop. HR in the DeFi era is required to be technologically adaptive and have critical and analytical thinking skills (Siregar & Ramli, 2020). Organizations that support the improvement of digital literacy and capabilities of their HR will be better prepared to face disruption (Harahap & Bakti, 2021). In addition to mastering technical aspects, HR also needs to build analytical, critical thinking, and collaborative skills in an increasingly digital and global work environment. Organizations that are able to encourage the development of digital capabilities and financial literacy in their employees will be better prepared to face technological disruption, manage risks, and take advantage of investment opportunities in the crypto and DeFi ecosystems. This transformation also has implications for the need for continuous education and training, both through formal programs and independent learning, so that HR remains relevant and competitive amidst very rapid changes.

SYNTHESIS OF CONCEPTUAL MODELS

The conceptual model in this study places digital capabilities and financial literacy as two main pillars in forming rational and adaptive investment behavior. The synergy between the two is the basis for HR transformation that is responsive to the development of technology and the digital market (Kristian & Setyawan, 2024).



Digital capabilities provide the technical foundation to understand and operate crypto investment instruments, while financial literacy equips individuals with a critical and strategic thinking framework in decision-making. The synergy between the two creates investors who are not only technologically proficient, but also financially wise, able to assess risks objectively, and not easily affected by market fluctuations or external pressures.

This model also emphasizes the importance of the role of continuing education and training in improving both capabilities. Educational institutions, regulators, and industry players need to work together to provide curriculum, literature, and learning platforms that are relevant to technological developments and the crypto market. Thus, an inclusive, safe, and sustainable digital investment ecosystem is created, and is able to drive the growth of the digital economy more broadly.

METHODOLOGY

This study uses a descriptive qualitative approach with a systematic literature study method to identify and analyze the relationship between digital capabilities, financial literacy, and crypto investment behavior. The study was conducted following the PRISMA protocol. *(Preferred Reporting Items for Systematic Reviews and Meta-Analyses),* which emphasizes the transparency of the literature selection and synthesis process.

The data collection process was carried out by searching for scientific articles in three main databases: Google Scholar, Directory of Open Access Journals (DOAJ), and Garuda. The keywords used

include: *digital capability*, *financial literacy*, *cryptocurrency investment*, *DeFi*, And *human capital transformation*.
The inclusion criteria applied include:

1. Articles published between 2018 and 2024;
2. Focus on issues related to digital capabilities, financial literacy, crypto investment, or HR in the digital era;
3. Open access and available in full text;
4. Using a qualitative conceptual, descriptive, or empirical approach.

Of the 82 articles identified in the initial stage, screening was carried out based on abstracts and content relevance, resulting in 15 main articles that were analyzed thematically. Data analysis was carried out using the technique content *analysis to* group the findings into main themes, namely: the role of digital capabilities, the influence of financial literacy, and the construction of a conceptual model of HR transformation in the context of digital finance.

DISCUSSION

THE ROLE OF DIGITAL CAPABILITIES

Digital capability is the main foundation for investors to enter and participate in the crypto investment ecosystem. In this context, digital capability not only includes basic skills in operating digital devices and applications, but also includes an in-depth understanding of blockchain technology, smart contracts, and cybersecurity mechanisms inherent in crypto assets. Investors with good digital capabilities are able to navigate various crypto exchange platforms, understand transaction procedures, and recognize important features such as two-factor authentication, cold storage, and data encryption. Digital capabilities play an important role in accessing and utilizing crypto technology. Digitally proficient investors can analyze trends, use on-chain data, and recognize potential risks (Wulandari & Prasetyo, 2018). Digital education and simulations are needed to improve these capabilities (Firdaus & Andayani, 2023).

In addition, digital capabilities also allow investors to conduct independent analysis of market trends, read crypto project whitepapers, and utilize various analytical tools and real-time data available online. This technical knowledge is crucial in identifying potential risks, such as price volatility, liquidity risk, and the threat of fraud (scams) and cyber-attacks. Thus, digital capabilities directly increase risk literacy and encourage more prudent and data-driven investment behavior.

On the other hand, low digital capabilities can make investors vulnerable to operational errors, such as incorrect asset transfers, loss of wallet access, or becoming victims of phishing and social engineering. Therefore, improving digital capabilities through education, training, and digital investment simulations is an important agenda in developing a healthy and sustainable crypto investment ecosystem.

THE INFLUENCE OF FINANCIAL LITERACY

Financial literacy plays a central role in shaping rational and responsible crypto investment behavior. Individuals with a high level of financial literacy will have a good understanding of the basic principles of investment, such as risk management, portfolio diversification, and long-term financial planning. They tend to be more critical in assessing information, able to distinguish between realistic investment opportunities and speculative schemes or even fraud. Financial literacy helps investors avoid speculative behavior, understand the fundamental factors of assets, and conduct due diligence before investing (Putra & Marlina, 2023; Suryani & Ramadhani, 2019). With this knowledge, investors can avoid impulsive investment behavior that is often triggered by FOMO (fear of missing out), social media hype, or

promises of instant profits from irresponsible parties.

Furthermore, financial literacy encourages investors to conduct due diligence before making investment decisions, including reading prospectuses, analyzing the reputation of project developers, and understanding the legal and tax risks that may arise. Thus, financial literacy not only functions as a self-protection tool, but also as a catalyst for building investment behavior that is oriented towards sustainability and long-term asset growth.

CONCLUSION

This study confirms that the synergy between digital capabilities and financial literacy is not only important but also essential in shaping rational, adaptive, and risk-resistant crypto investment behavior. The findings show that investors who master both aspects are able to read market trends using on-chain data, avoid impulsive investments, and manage risks more effectively. In the complex and disruptive digital financial landscape, technical understanding and financial capabilities need to be integrated into a critical and strategic thinking framework. In this way, investors can identify opportunities and proactively avoid increasingly sophisticated fraud schemes.

The conceptual model in this article offers a new contribution to the academic literature by combining two core competencies as drivers of digital HR transformation. Theoretically, this model fills the literature gap with a multidimensional approach that unites the technology and finance domains. Practically, these findings can be used as a basis for designing educational curricula, community training, and digital-based financial inclusion strategies. This model is a new, more relevant and contextual basis for thinking in facing investment challenges in the DeFi era.

This article not only bridges the gap in previous studies but also opens a new direction for the development of an inclusive, safe and sustainable digital investment ecosystem. Investment in digital capabilities and financial literacy is no longer an option, but a key strategy in creating resilient human resources and stable financial markets. The model produced in this study is an important foundation for the formation of investors who are technologically proficient, financially wise and ready to face digital disruption sustainably.

IMPLICATIONS

The main implications of this study reflect the importance of a multidimensional approach in understanding digital financial literacy, which does not separate the domains of technology and finance. Theoretically, this article supports the integration of digital capabilities and financial literacy as the basis for HR transformation in facing the increasingly complex digital financial ecosystem. Practically, there is an urgency to design technology-based public education and community training programs that are responsive to the dynamics of the crypto and DeFi markets. Educational institutions are advised to develop cross-disciplinary curricula that include blockchain literacy, digital investment, and data-based risk mitigation. The government has a strategic role as a facilitator of digital financial inclusion through adaptive policies and national literacy campaigns, while industry players need to ensure transparency and user-friendly technology-based education. Strengthening these two capabilities should be seen as a long-term investment for individual resilience, financial system stability, and expanding community participation in the digital economy, so that it can encourage inclusive and sustainable growth.

However, this study has several important limitations that need to be considered. First, because it is entirely based on a systematic literature review, this

study does not involve primary data or empirical validation that can strengthen the generalization of the conceptual model produced. Second, the number of articles analyzed is limited to 15 publications in the 2018–2024 period, so it is possible that the latest developments in the DeFi ecosystem and investor behavior have not been fully covered. Third, the geographic, demographic, and regulatory contexts have not been an explicit focus, even though these factors greatly influence the level of digital capability and financial literacy. Fourth, the conceptual model developed is exploratory in nature and has not been tested quantitatively or through a quantitative approach *mixed methods*, so that its external and implemented validity is still limited. Therefore, further research needs to overcome these limitations so that theoretical and practical contributions can be maximized in forming an inclusive and adaptive digital financial ecosystem.

SUGGESTIONS AND RECOMMENDATIONS

Based on the identified findings and limitations, further research is suggested to adopt a cross-country or demographic approach to further explore the influence of social, economic, and regulatory contexts on investment behavior in the crypto ecosystem. Differences in geographic and cultural characteristics are believed to influence the level of digital capability and financial literacy, as well as investor response to risk. Population focus can be directed at millennials, Gen Z, and novice investors in developing and developed countries to obtain a richer comparative picture. This approach will not only broaden the generalizability of the findings but also provide a stronger foundation in designing strategies to improve digital and financial literacy contextually. Cross-country research can also contribute to mapping the readiness of global human resources in facing the wave of increasingly decentralized and disruptive digital financial transformation.

On the other hand, cross-disciplinary collaboration in education and research is a strategic urgency in forming new competencies in the DeFi era. Higher education institutions need to develop curricula that integrate information technology, digital finance, and data-based investment behavior. To test the empirical validity of the conceptual model that has been developed, future research is recommended to use a quantitative approach or mixed-method with primary data. The use of mediating variables such as critical *thinking*, *behavioral bias*, or *investment intention is* also recommended to strengthen the causal relationship in the theoretical framework. In addition, educational experiments based on digital financial literacy training can be used to measure behavioral changes directly. This approach will strengthen the practical and policy relevance of the study results, while encouraging the development of an inclusive, resilient digital financial ecosystem based on the real competencies of the community in the digital era.

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