Digital Financial Literacy and the Financial Health of the Owners of Micro Enterprises in Calapan City

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ABSTRACT: Digital financial literacy refers to understanding and using digital technologies to manage finances. However, owners cannot sustain their business growth due to a lack of financial access and limited knowledge of technologies. The purpose of this research is to investigate whether digital financial literacy influences the financial health of Calapan City microenterprise owners. The investigator specifically chose 76 microenterprise proprietors in Calapan City. Using a quantitative research approach and descriptive correlation data, the study was able to collect the necessary data to accurately anticipate a particular problem or hypothesis. To convert the qualitative responses into numerical values, the Likert scale was employed. Researchers created questionnaires and used them to interview microenterprise owners to obtain data. Data input and analysis were conducted using a correlational technique to examine the relationship between digital financial literacy and the financial health of the microenterprise owners. The data has been displayed in tabular format. The research found that digital knowledge, awareness of digital financial services, practical know-how in using digital financial services, and the ability to avoid fraud substantially influenced the financial health of the microenterprise owners. Nevertheless, the research underscored the importance of promoting digital financial literacy among owners of microenterprises to enhance their financial health. For this reason, the study proposes that microenterprise owners should have strategies to have more stable financial health.

KEYWORDS - Ability to avoid fraud, awareness in digital financial services, digital financial literacy, digital knowledge, practical know-how in using digital financial services

I. INTRODUCTION

The advent of digital technology in the modern world has undeniably changed many aspects of life. It has also expanded into education, communication, business, and even finance. In modern times where most transactions can be done digitally, most businesses and individuals rely on technology to keep their businesses working and growing as well as to manage their finances. With these factors at hand, entrepreneurs must have adeptness in digital financial literacy. This causes entrepreneurs to need higher financial sophistication to effectively use fintech products and avoid fraud. According to Morgan et al. (2019), digital financial education programs are needed to improve digital financial literacy, focusing on skills critical for the digital economy. Moreover, digital financial literacy includes knowledge of digital financial products, services, risks, risk control, and consumer rights [1].

Digital financial literacy prioritizes the knowledge and abilities required to conduct financial transactions on digital platforms. A person who possesses digital financial literacy is capable of utilizing digital devices to enhance their financial decision-making process. The ubiquitous nature of financial technology (Fintech) generates opportunities for digital literacy education and training. As explained by Saon Ray et al. (2022) in their study titled Digital Financial Inclusion and Literacy from a G20 Perspective, G20 countries have the highest digital financial literacy level of practice. With international power and advanced resources, 70%-80% in the G20's economic sector and digital finance literate. In addition, the use of the Global Partnership for Financial Inclusion (GPFI), which is a platform for G20 member countries, helping develop digital financial literacy, interested non-G20 countries, and relevant stakeholders such as the World Bank and the Organisation for Cooperation and Development, will enable the realization of financial inclusion to achieve one of the agenda items, the 2030 Sustainable Development Goals [2].

The Philippines faces challenges in digital financial literacy due to cultural barriers and limited educational resources. Family expectations and reliance on government pensions underscore the need for a shift towards greater financial independence and literacy. However, the rise of finance influencers and the younger generation's interest in digital financial services indicates a growing awareness and demand for digital financial

education. As explained by Joe Zaldarriaga (2022), the rise of the e-commerce industry created a domino effect on the financial industry, having recorded a rise in the number of banked Filipinos [3]. This is shown by the Bangko Sentral ng Pilipinas (BSP) reporting that 23% of the Filipino adult population is now banked, up from only around 13% in 2019. Even more notable is the increase in the number of banked Filipinos with e-wallet accounts. From 8% in 2019, users have gone up to 36%. Reports said millennials and Generation Z, which comprise 70 percent of the Philippine population, are among the driving forces behind this e-wallet adoption. Then there are the e-wallets that have further evolved, offering more services and solutions for Filipino customers [4].

Calapan City, as a booming beacon of economic stability, has continuously grown efficiently as different enterprises mushroomed in town. With Calapan City being situated in a less urbanized area than Manila, there are still micro-entrepreneurs who traditionally manage their business finances. Several owners of microenterprises in Calapan City are not familiar with different areas and concepts of digital tools that can help them to have proper allocations when it comes to their business operations. Also, the proprietor needs to raise capital from banks and other sources for the reason that they are unable to access different kinds of digital financial products or services that they can use to launch, innovate, expand, and develop their enterprises due to inadequate access to funding.

Microenterprises in Calapan City cannot sustain the growth of their businesses for the reason that owners lack digital financial access and digital knowledge; they are not aware of accessing different kinds of digital business finances, and the various kinds of fraud are rising in today's interconnected world that they may experience and eventually affect in their financial business operations. The objective of this study is to provide additional knowledge and strategies for the owners so they can meet their long-term financial objectives and build a successful firm. The findings in this study can offer insightful perspectives that can lower potential risks. This research can provide a comprehensive understanding of how the dimension of digital financial literacy can influence the financial health of micro-enterprise owners in Calapan City, Oriental Mindoro. So that owners can make informed financial decisions, manage their businesses efficiently, reduce digital financial risk, and access essential financial services that can help to improve their financial health.

II.   REVIEW OF RELATED LITERATURE

2.1 Digital Financial Literacy

Digital financial literacy (DFL) encompasses the knowledge, skills, and confidence to safely use digital financial products and services for informed financial decisions (Alliance for Financial Inclusion, 2021) [5]. It plays a crucial role in financial health, promoting better budgeting, savings, and access to digital banking services (Abdallah et al.) [6]. DFL is crucial for navigating the digital economy, encompassing digital knowledge, awareness of services, practical know-how, and fraud avoidance (Choung) [7]. Digital knowledge is essential for accessing financial services and adopting sound financial practices (Morgan et al., 2019) [8]. Awareness of digital financial products and services is crucial, emphasizing the need to understand the functions of various service types available through digital channels (Morgan et al., 2019) [9]. DFL also embraces digital and financial skills, encompassing the usage and accessibility of digital services (Lyons and Hanna, 2021) [10]. Individuals with higher DFL are more likely to avoid fraud-related losses and have the ease of using digital media to access digital services (Wei) [11].

2.1.1. Digital Knowledge

Digital knowledge, as defined by Zhang [12], refers to the ability of entrepreneurs to understand and use digital technologies for managing their financial affairs, such as online banking and mobile payments. This knowledge empowers rural microenterprises by enhancing their understanding of financial services and improving the efficiency of their business operations. By embracing digital technologies, such as digital payments and cloud computing, microenterprises can streamline processes, reduce costs, enhance customer satisfaction, and improve data-driven decision-making, ultimately leading to greater financial success. This aligns with research by Susilowati et al. [13] and Junhong et al. [14], which emphasizes the importance of digital knowledge for MSMEs in understanding and utilizing digital tools for financial reporting and achieving economic growth.

2.1.2. Awareness of Digital Financial Services

Awareness of Digital Financial Services (DFS) refers to understanding how DFS is used and comparing the pros and cons of each product/service type (Alliance for Financial Inclusion, 2021) [15]. Increased awareness correlates with higher levels of digital financial literacy in Southeast Europe's MSME sector, leading to greater utilization of these tools and a more digital-oriented approach to business operations (OECD Ilibrary, 2023b) [16]. Digital financial services, such as mobile money and digital wallets, empower small businesses by simplifying operations and improving financial management, including online banking,

customer communication, and supply chain management (OECD Ilibrary, 2023b) [16]. Advancements in technology, like big data and cloud computing, streamline finance and drive economic growth. Digital tools also enhance financial record-keeping for microenterprises, enabling better decision-making (OECD Ilibrary, 2023b) [16]. Entrepreneurs with a deeper understanding of digital financial services are more inclined to attain positive outcomes and maximize gains that are good for their financial health (Serido et al., 2020) [17]. Awareness of digital financial services is critical for enhancing financial health. It empowers individuals to access a wider range of products and services. This awareness fosters informed decision-making, leading to improved financial stability and greater economic resilience in the digital age.

2.1.3. Practical know-how of using digital financial services

Practical application of knowledge and skills in digital finance refers to the ability to effectively use digital financial tools and services in real-world situations (Bai et al., 2021) [18]. This includes confidently navigating DFS and utilizing fintech tools, such as online banking and mobile payments. A key indicator of DFS usage is the percentage of adults with accounts at formal financial institutions or with mobile money app providers (Yoshino and Morgan, 2017) [19]. Traditionally, SMEs relied on manual methods for financial tracking, which were time-consuming and prone to errors. Cloud-based systems automate data entry, reducing errors and freeing up time for strategic planning. Digital services like electronic banking minimize the need for extensive physical infrastructure and enable real-time financial reporting. Practical know-how in financial reporting involves understanding digital tools, methodologies, and the integration of technology with traditional practices (Rhiana et al., 2023) [20]. Software applications, such as Google Sheets, facilitate the creation and management of financial reports, making them more user-friendly and reducing errors associated with manual bookkeeping. Practical know-how in using digital financial services can enhance financial health for business owners by facilitating access to formal financial systems, improving firm performance, and enabling profitable business relationships, ultimately fostering formal entrepreneurship.

2.1.4. Ability to Avoid Digital Fraud

Digital fraud refers to the use of digital means to deceive or manipulate individuals or organizations for financial gain (Donning et al., 2019) [21]. Individuals with higher digital financial literacy are more likely to detect and avoid fraud (Engels et al., 2019) [22]. Mobile banking services employ security measures like usernames, passwords, and biometric identification (Smith et al., 2022) [23] to protect against unauthorized access and digital fraud. Internal auditing, including regular assessments and the use of machine learning algorithms, helps businesses identify and mitigate potential fraud risks (Bonrath et al., 2024; Lokanan et al., 2024) [24, 25]. Machine learning algorithms efficiently analyze data, facilitating quicker detection and proactive intervention. Cashless payments can also contribute to fraud reduction (Fernandes, 2014) [26]. Regular security audits and risk assessments are essential to understanding a business's cybersecurity posture (Barnty et al., 2024) [27]. These assessments identify vulnerabilities and potential attack vectors. Individuals with higher digital financial literacy are better able to recognize and steer clear of online scams, safeguarding against financial theft (Khursheed, 2024) [28]. Understanding internet security and preventing financial fraud are crucial aspects of digital financial literacy.

2.2. Financial Health

Digital financial literacy positively impacts financial health by enabling informed financial decisions, enhancing knowledge, and improving understanding of financial systems (Culebro-Martinez et al., 2024) [29]. Embracing simple digital banking solutions can improve financial management and set the foundation for growth and success for small businesses (Osterling, 2023) [30]. The use of cashless payments can enhance financial performance by reducing costs and increasing sales, leading to better financial health (Masri et al., 2024) [31]. Understanding how fraud can affect their organizations is crucial for business owners to prevent or detect it and avoid devastating consequences (Kramer, 2015) [32]. Digital financial literacy empowers microbusiness owners to leverage digital tools and platforms for effective financial management. Digital financial reporting systems, such as those utilizing digital tools, improve data analysis, efficiency, and accuracy, benefiting business owners' financial health (Susilowati et al., 2023) [33]. Improving their digital financial literacy, microbusiness owners can boost profitability, improve money management, and become more resilient to economic downturns, contributing to business and economic growth and sustainability.

III.   THEORETICAL FRAMEWORK

3.1. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) proposed by Davis explains how individuals adopt technology based on perceived usefulness and ease of use. This study applies TAM to understand

microenterprise owners' perceptions of digital financial services. Findings suggest that owners are more likely to adopt these services if they perceive them as beneficial and easy to use.

3.2. Unified Theory of Acceptance and Use of Technology (UTAUT)
The Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. explains technology adoption based on factors like performance expectancy, effort expectancy, social influence, and facilitating conditions. This framework, which integrates previous models like TAM and TPB, helps understand microenterprise owners' adoption of digital financial services. Factors such as perceived benefits, ease of use, social encouragement, and available infrastructure significantly influence their engagement with these services.

3.3. Task-Technology Fit (TTF)
The Task-Technology Fit (TTF) theory by Goodhue & Thompson suggests that aligning technology with specific tasks enhances user performance. This framework, with components like task characteristics, technology features, and perceived fit, helps understand how microenterprise owners interact with digital financial tools. Aligning their financial needs with the capabilities of these tools, owners can improve efficiency, accuracy, and decision-making, ultimately leading to positive financial outcomes and business success.

3.4. Financial Inclusion Theory
The Financial Inclusion Theory by Ozili emphasizes the crucial role of financial literacy education in achieving financial inclusion. By improving individuals' understanding of financial concepts, it empowers them to make informed decisions, access financial services effectively, and improve their overall financial health. This principle applies to digital finance, empowering micro-enterprise owners to effectively use digital services, mitigate risks, and access wider financial opportunities.

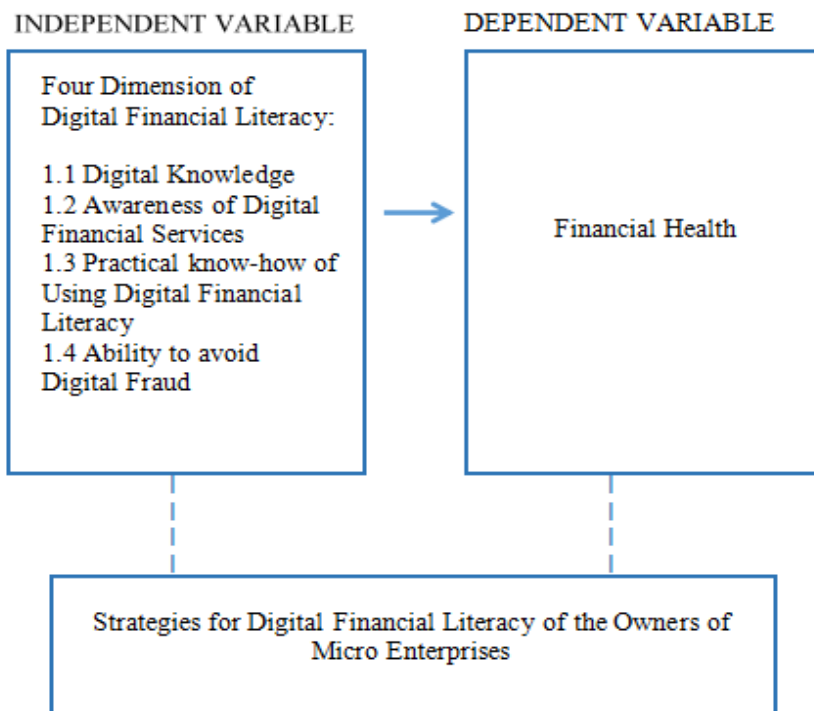# IV.   CONCEPTUAL FRAMEWORK

Figure 1. Conceptual Framework

The figure above presents the conceptual framework of the study. It includes the independent and dependent variables as well as the output of this research. The independent variable is digital financial literacy which is 1.) digital knowledge 2.) awareness of digital financial services, 3.) practical know-how of using digital financial services, 4.) Ability to avoid digital fraud. The dependent variable is the financial health of the owners of micro-enterprises. The output of this study is to develop strategies for the digital financial literacy of micro-enterprises.

V.   STATEMENT OF THE PROBLEM

The general problem of this study is to assess the Digital Financial Literacy and the Financial Health of Micro Enterprises in Calapan City, Oriental Mindoro. It seeks to address potential issues brought on by digital financial literacy.

The study sought to answer the following questions:

1.   As assessed by the owners of Micro Enterprises, what is the level of digital financial literacy in terms of:
    1.1.   Digital Knowledge;
    1.2.   Awareness of Digital Financial Services;
    1.3.   Practical know-how in using Digital Financial Services; and
    1.4.   Ability to avoid Digital Fraud?
2.   What is the status of financial health among the owners of Micro Enterprises in Calapan City?
3.   Is there a significant relationship between the level of digital financial literacy and the financial health of the owners of micro-enterprises?
4.   Based on the analysis, what strategy for digital financial literacy and financial health may be proposed?

VI.   HYPOTHESIS

H0: There is no significant relationship between digital financial literacy and the financial health of the owners of micro-enterprises.

VII.   MATERIAL AND METHODS

7.1 Research Design

This study utilized a quantitative research design, specifically employing a descriptive correlational approach. Quantitative research focuses on collecting and analyzing numerical data to identify patterns, make predictions, and test relationships between variables. Descriptive correlational research aims to understand the relationships between two or more variables without establishing cause and effect. Analyzing the data on these variables, researchers can identify potential associations and explore the strength and direction of these relationships within the study population. This approach allows for the systematic examination of data to uncover meaningful insights and inform further investigation.

7.2 Subject and Sampling

This study employed a purposive-random sampling technique. Initially, purposive sampling was used to select micro-enterprises meeting specific criteria: less than 10 employees, total assets between 500,000 and 3,000,000, and active utilization of digital tools in business operations. A list of 3,932 businesses was obtained from the Business Permits and Licensing Office to identify potential participants. Subsequently, a random sample of 77 businesses was selected from this pool. The sample size was determined using the Raosoft Sample Size Calculator, considering a 95% confidence level and a 5% margin of error.

7.3 Data Gathering Procedures and Instrumentation

This study utilized a researcher-made questionnaire to gather firsthand information from respondents while preserving their anonymity. The questionnaire comprised two parts: one assessing digital financial literacy and the other evaluating the owner's financial health. Secondary data from scholarly journals, official data, and industry statistics were also incorporated. The questionnaire was validated by a psychometrician, a financial advisor, and a statistician. Data was collected and analyzed using the Likert scale, a rating system measuring respondents' attitudes. Tables were created to display the data, and various methods were used for analysis. The research instrument was reviewed by a statistician and thesis advisor to ensure data quality and reliability.

Table 1. Likert Scale Interpretation for Digital Financial Literacy

Options	Statistical Range	Description	Interpretation
4	3.50 - 4.00	Strongly Agree (SA)	High Level
3	2.50 - 3.49	Agree (A)	Moderate Level
2	1.50 - 2.49	Disagree (D)	Low Level
1	1.00 - 1.49	Strongly Disagree (SD)	No Level

Table 2. Likert Scale Interpretation for Financial Health

Options	Statistical Range	Description	Interpretation
4	3.50 - 4.00	Strongly Agree (SA)	Very Good
3	2.50 - 3.49	Agree (A)	Good
2	1.50 - 2.49	Disagree (D)	Fair
1	1.00 - 1.49	Strongly Disagree (SD)	Poor

7.4 Reliability

To ensure the reliability of the questionnaire, two methods were employed. Firstly, test-retest reliability was assessed. This method evaluates the consistency of results over time by administering the same questionnaire to the same participants on two separate occasions. Comparing the scores from both administrations, researchers can determine the stability and consistency of the instrument.

Secondly, Cronbach's alpha was used to assess internal consistency. Cronbach's alpha measures the extent to which items within the questionnaire that are designed to measure the same construct produce similar results. A higher Cronbach's alpha coefficient indicates greater internal consistency among the items, suggesting that the questionnaire reliably measures the intended construct.

Table 3. Reliability Results

Variables		Cronbach's Alpha	Interpretation
Digital Financial Literacy	Digital Knowledge	.893	Good
	Awareness of Digital Financial Services	.871	Good
	Practical Know-How of Digital Financial Services	.900	Good
	Ability to avoid Digital Fraud	.878	Good
Financial Health		.809	Good
Overall		**.847**	**Good**

Table 3 presents the results of the reliability analysis, conducted using Cronbach's alpha to assess the internal consistency of the variables. The results show excellent reliability for Digital Knowledge ($\alpha = 0.893$), Awareness of Digital Financial Services ($\alpha = 0.871$), Practical Know-How of Digital Financial Services ($\alpha = 0.900$), and Ability to avoid Digital Fraud ($\alpha = 0.878$) indicating that the items included are consistently measuring the intended constructs. Meanwhile, Financial Health ($\alpha = 0.809$) demonstrated acceptable reliability, indicating some variability in responses while still being generally consistent. Overall, a reliability score $\alpha = 0.847$ indicates that the scale is reliable. This suggests that the items indicate a high degree of internal consistency, suggesting that the questionnaire reliably measures the intended constructs. This analysis provides confidence in the reliability and validity of the data collected.

7.8. Data Analysis

The study involved 76 participants who were asked to complete survey questionnaires. Frequency count, percentage, mean, standard deviation, and Cronbach's alpha were among the statistical tools used for analysis. To make sure the questionnaire was reliable, test retests were carried out. Google Sheets was used for all data tabulation and analysis. Three respondents were interviewed by researchers to obtain a comprehensive understanding of the findings, confirming their conclusions and enhancing the study's validity.

VIII.   RESULTS AND DISCUSSION

8.1 As assessed by the owners of Micro Enterprises, what is the level of digital financial literacy in terms of:
8.1.1 Digital Knowledge

Table 4 Mean and Verbal Interpretation on the Level of Digital Financial Literacy in Terms of Digital Knowledge

Items	Mean	Rank	Description	Verbal Interpretation
1. I have an advantage in the ease of transactions in digital payments.	2.87	3	Agree	Moderate Level
2. I have knowledge of Digital Financial Services software "when creating" user accounts and "managing" passwords for business affairs	2.88	2	Agree	Moderate Level
3. I have a favorable attitude towards mobile banking.	2.84	4	Agree	Moderate Level
4. I adapt my cloud computing knowledge within my business to "enhance" my decision-making.	2.74	5	Agree	Moderate Level
5. I use or am familiar with digital tools for the financial reporting of my business.	2.97	1	Agree	Moderate Level
Overall Mean	**2.86**		**Agree**	Moderate Level

The statement "I use or am familiar with digital tools for financial reporting of my business" has the highest mean score of 2.97 which is interpreted that owners of microenterprises have a "moderate level" when it comes to using digital tools for their financial reporting. This suggests that respondents have the most confidence or proficiency in using digital tools for financial reporting, showing the highest level of digital knowledge in this aspect. Based on the respondent, digital knowledge helps them to evaluate different digital financial products and services by comparing interest rates, and assess fees. Knowledge in digital financial literacy is crucial as it empowers individuals to navigate the digital economy safely. This knowledge is fundamental for making informed decisions in an increasingly online financial world (Sameh, 2024) [34].

While Item 4: "I adopt my cloud computing knowledge within my business to 'enhance' my decision-making" has the lowest mean score of 2.74, which interpreted that owners of microenterprises have a "moderate level" in adopting cloud computing knowledge in their business that enhances their decision-making. This area shows room for improvement, indicating that cloud computing knowledge is less frequently applied compared to other digital tools and services. According to Sharma in (2024), cloud computing not only enhances data accessibility but also enables real-time decision-making by reducing the time required for data processing [35]. Therefore, owners that often apply cloud computing knowledge in their financial business operations can analyze and gain deep insights, for the reason that it offers solutions and easy access to data for users.

The total mean score is 2.86, which falls within the range of a "agree" interpreted a "moderate level." This indicates that respondents, on average, exhibit a strong level of digital financial literacy across all assessed areas. Despite the overall positive evaluation, areas such as cloud computing knowledge for decision-making and attitudes toward mobile banking appear to be slightly less developed compared to the usage of digital tools for financial reporting or digital payment systems. The evolution of cloud computing over the past few years is potentially one of the major advances in the history of computing. However, if cloud computing is to achieve its potential users will have clear understanding in various perspectives that can help in their decision making (Davoody, 2022) [36]. Moreover, as our modern society is gradually catching the cashless syndrome. Mobile banking is now the order of the day at businesses, through this users of mobile banking can have the potential of applying techniques to effectively control the security threats and finally presents a model for knowledge extraction in a cashless environment (Akinola, 2015) [37].

8.1.2 Awareness of Digital Financial Services

Table 5 Mean and Verbal Interpretation on the Level of Digital Financial Literacy in Terms of Awareness of Digital Financial Services

Items	Mean	Rank	Description	Verbal Interpretation
1. I find it convenient to use digital financial services in managing my business.	3.13	2	Agree	Moderate Level
2. I am aware I can use my smartphone to manage customer communications, purchase supplies, and handle other administrative tasks.	3.20	1	Agree	Moderate Level
3. I am capable of opening bank accounts or accessing basic financial services through mobile banking applications.	2.78	4	Agree	Moderate Level
4. I am up-to-date on advancements in big data and	2.74	5	Agree	Moderate Level

		Mean	Rank	Description	Verbal Interpretation
	cloud computing as these technologies have simplified financial processes and opened up new opportunities.				
5.	I am informed of how digital financial tools maintain better records of my business financial transactions.	2.93	3	Agree	Moderate Level
	Overall Mean	**2.96**		**Agree**	Moderate Level

The statement "I am aware I can use my smartphone to manage customer communications, to purchase supplies, and to handle other administrative tasks" has the highest mean score of 3.20, interpreted as "moderate level." The respondents are well aware of how to use their smartphones to contact their customers, might it be on messaging apps like Messenger and Whatsapp as well as in emails. They can also use these apps to place supply orders on-the-go, and manage schedules and tasks using productivity tools which helps them work efficiently in and out of their workplace. This indicates that respondents have strong awareness and confidence in leveraging smartphones for managing various business-related tasks, showcasing their digital financial literacy in this area. According to Agarwal and Bhagoliwal (2016), smartphones have become essential tools across various industries, from large corporations to small businesses and institutions like hospitals and schools. Their rapid internet speeds and accessibility make them ideal for business purposes [38].

However, Item 4: "I am up-to-date on advancements in big data and cloud computing as these technologies have simplified financial processes and opened up new opportunities" has the lowest mean score of 2.74, interpreted as "moderate level." The respondents mostly are not aware of the existence of big data and cloud computing as they adhere to traditional means like manual computations. Some are not familiar overall as they are not informed of the benefits if traditional means already do the job just right and it's much more complex for them. According to Chen, et. al. (2016), Cloud computing offers significant benefits, particularly in support activities.It enhances IT and business capabilities, leading to improved profit compared to traditional on-premise models. Cloud computing can provide substantial advantages for both micro and large businesses, potentially surpassing the benefits of traditional on-premise approaches [39].

The total mean score is 2.96, indicating a "moderate level" of awareness regarding digital financial services. The respondents demonstrate the highest awareness of smartphone-based financial management and the convenience of digital financial services. They know how to use these digital tools and are aware of the benefits they give. Bashir and Tariq (2018) suggest that access to financial information and services through smartphones likely contributes to increased financial awareness, potentially enabling informed financial decisions [40]. Also, awareness of advancements in big data and cloud computing technologies is relatively lower, suggesting the need for further education and training in this aspect. The Gartner Hype Cycle for Emerging Technologies (Gartner, 2024) provides a framework for understanding the maturity and adoption of technologies, including big data and cloud computing [41]. There's a need for increased education and training initiatives to bridge the gap between technological advancements and public understanding.

8.1.3 Practical Know-How of Digital Financial Services
Table 6 Mean and Verbal Interpretation on the Level of Digital Financial Literacy in Terms of Practical Know-how of Using Digital Financing Services

Items		Mean	Rank	Description	Verbal Interpretation
1.	I know how to complete a transaction using digital financial services.	3.04	1	Agree	Moderate Level
2.	I use digital finance services in dealing with my business bills tax payments, and purchasing.	2.90	2	Agree	Moderate Level
3.	I know how to use online banking for business financial transactions.	2.86	4	Agree	Moderate Level
4.	I use cloud-based financial management systems to automate data entry, to reduce the potential for human error, and to free up time for more strategic financial planning for my business.	2.64	5	Agree	Moderate Level
5.	I know how to use software applications to facilitate the creation and management of my business financial reports, to make them more user-friendly, and to reduce errors associated with manual bookkeeping.	2.88	3	Agree	Moderate Level
	Overall Mean	**2.87**		**Agree**	Moderate Level

The statement "I know how to complete a transaction using digital financial services" ranked first and interpreted as "Moderate Level". This suggests that respondents are highly skilled and confident in performing transactions through digital financial services like payments and purchasing, indicating their strong practical knowledge in this specific area. Based on the respondents, digital financial services (DFS) enable access to various financial products and services that help them to manage their money more effectively. and according to Ocharive and Iworiso (2024), DFS that is well managed individuals can increase their assets, enhance their standard of living, and support economic growth [42].

While the statement "I use cloud-based financial management systems to automate data entry, to reduce the potential for human error and to free up time for more strategic financial planning for my business" still interpreted as "Moderate Level," this item suggests that cloud-based financial systems are the least utilized or understood among respondents, highlighting an area for improvement in their digital financial literacy. Cloud computing is no longer just a competitive advantage, it is necessary. According to Manjila (2024) leveraging the cloud, financial institutions can achieve cost efficiencies, scale services, and improve customer experiences [43]. As the industry evolves, institutions must prioritize cloud adoption and testing to ensure their applications perform optimally and securely, for the reason that it can help business owners to streamline their financial operations and provide greater flexibility and efficiency.

The total mean score is 2.87, indicating a "moderate level" of practical know-how in using digital financing services. Respondents demonstrate the greatest competency in completing transactions through digital services and managing business financial tasks like payments and taxes. Whereas, the area for improvement of cloud-based financial management systems shows the lowest score, indicating the need for better training or awareness in this area to enhance efficiency and strategic financial planning. As key drivers of innovation in the digital world, the success of online platforms is closely tied to the success of a range of businesses that use digital platforms to reach customers. These digital platforms allow especially smaller businesses to extend their operations and can leverage real-time payments and settlement options that can accelerate revenue growth faster than competitors. In the finance industry, cloud computing is the practice of managing, storing, and processing financial data via cloud-based services and solutions. It enables users to provide real-time financial data and analysis for decision-making and enhances efficiency in strategic financial planning (Garett, 2024) [44].

8.1.4 Ability to Avoid Digital Fraud

Table 7 Mean and Verbal Interpretation on the Level of Digital Financial Literacy in Terms of Ability to Avoid Digital Fraud

Items	Mean	Rank	Description	Verbal Interpretation
1. I am aware of the importance of having preventive features for mobile banking services to protect against unauthorized access and digital fraud for my business financial transactions.	3.26	1	Strongly Agree	High Level
2. I am able to perform internal audits for business operations, such as purchasing supplies and managing inventories to ensure proper management.	3.05	2	Agree	Moderate Level
3. I am aware of the role of the machine learning algorithm in detecting errors and preventing financial risks in business operations.	2.93	4	Agree	Moderate Level
4. I am knowledgeable about important roles in cashless transactions such as e-transactions and e-payments in reducing fraud.	2.88	5	Agree	Moderate Level
5. I am aware that conducting regular security audits can help my business to be more secure from digital fraud.	2.99	3	Agree	Moderate Level
Overall Mean	**3.03**		**Agree**	Moderate Level

The statement, "I am aware of the importance of having preventive features for mobile banking services to protect against unauthorized access and digital fraud for my business financial transactions," has the highest mean score of 3.26 and is interpreted as agreeing with "high level." It could be ascertained from the information gathered that they are aware of cyber threats. Having features like multi-factor authentication, biometric verification, and real-time alerts are essential to protect their business's financial information. Respondents strongly agree about the importance of having preventive features for mobile banking to protect against unauthorized access and digital fraud. According to Asfour and Haddad (2014), they showed that there

is a statistically significant impact between security dimensions on enhancing customer E-satisfaction in using mobile banking [45].

On the other hand, the statement "I am knowledgeable about important roles in cashless transactions such as e-transactions and e-payments in reducing fraud" ranked last with a mean score of 2.88, though interpreted as agree with "moderate level." Respondents seem to have a lower understanding of how cashless transactions can prevent fraud. This might be because they don't focus on or aren't familiar with this aspect. Some are still doubtful of the capabilities of these services as they seem vulnerable to cyber attacks. According to Armey et al. (2014), the adoption of cashless payment systems offers several advantages over traditional cash transactions as one significant benefit is the reduction of criminal activities such as robbery and theft, as cashless transactions eliminate the need for physical currency . This can contribute to a safer and more secure environment for both businesses and consumers [46].

The total mean score of 3.03 indicates an overall verbal interpretation of "moderate level" of digital fraud awareness among respondents, suggesting they generally believe they have adequate knowledge to prevent such incidents in their financial operations. As the respondents are generally aware that there is security within the use of mobile banking. This finding aligns with consistent findings from the Federal Trade Commission (FTC, 2014-2024) and the National Cyber Security Centre (NCSC, 2014-2024), which have shown a moderate level of public awareness regarding digital fraud while also highlighting the evolving nature of online threats and the persistent need for improved public education. While respondents demonstrate a general agreement and awareness of practices to avoid digital fraud, there is significant room for improvement in understanding and leveraging advanced technologies and cashless systems, as evidenced by ongoing research on the evolving digital landscape (Pew Research Center, 2014-2024) and the challenges and opportunities associated with cashless payment systems. The respondents are still conscious of the danger that cashless payments recently are one of the areas that are vulnerable to cyberattacks.

8.2 What is the status of the financial health of owners of Micro Enterprises in Calapan City?

Table 8 Mean and Verbal Interpretation on the Financial Health of Micro Enterprise Owners in Calapan City

Items	Mean	Rank	Description	Verbal Interpretation
1. I have the right digital knowledge for decision-making to improve financial well-being.	3.11	1	Strongly Agree	Very Good
2. I am aware that adapting digital accounting systems can improve my decision-making in order to ensure sustainability in my financial health.	2.99	5	Agree	Good
3. I know that maximizing the use of digital banking can improve my financial health	3.09	2	Agree	Good
4. I am aware that adopting cashless payments correctly may lead to better financial health.	3.05	3	Agree	Good
5. I know that having the ability to avoid fraud can enhance my financial health by preventing any disproportionate median loss.	3.01	4	Agree	Good
Overall Mean	**3.05**		**Agree**	Good

For the statement, "I have the right digital knowledge for decision-making to improve financial well-being," it got the highest mean score of 3.11 which is interpreted as "Very Good". This indicates that Micro-enterprise owners agree that having the right digital knowledge for decision-making is critical to improving financial well-being and is perceived as a foundational element in maintaining financial health. Most respondents are already aware of their capabilities to use basic digital financial tools. However, most need guidance with other complex tools. According to Logeais and Ilieva (2021), they observed significant advantages from the implementation of digital technologies within business operations. These benefits encompass improved efficiency in information gathering, robust data analysis capabilities, streamlined data summarization, substantial time savings, and enhanced communication channels [47].

However, the statement "I am aware that adapting digital accounting systems can improve my decision-making in order to ensure sustainability in my financial health" showed the lowest mean score of 2.99, however, still interpreted as "good.". This shows that awareness of the role of digital accounting systems in ensuring sustainability ranks the lowest. This may suggest that while owners recognize its importance, there may be limited knowledge or practical implementation of such systems in their operations. They do not believe that it will; significantly help their business. They are either concerned of the security and privacy risks associated with these systems or they rather prefer using traditional accounting methods. According to Al-

Okaily et al. (2023), that while digital accounting systems offer valuable tools, the focus should be on ensuring the quality of the information generated to help in decision-making. This requires a strong emphasis on data quality and a supportive organizational culture that values data-driven decision-making [48].

The total mean score of 3.05 corresponds to a verbal interpretation of "good," indicating that micro-enterprise owners in Calapan City generally believe they possess sufficient digital knowledge and skills to enhance their financial health. In the current state of their business and the digital world, they believe that they hold just the right amount of knowledge and skills to sustain their business. This finding aligns with research emphasizing the importance of digital literacy for financial inclusion (World Bank Group, 2021; UNCTAD, 2022). While microenterprise owners in Calapan City perceive themselves as capable of using digital tools to improve their financial health, there is room for improvement in adopting advanced systems and practices like digital accounting and fraud prevention. Digital accounting and fraud prevention is still a sensitive topic, as they more so use traditional means of reporting. This aligns with findings from the Global Entrepreneurship Monitor (GEM, Annual Reports), which highlight the need for continuous improvement in the digital capabilities of MSMEs. These gaps can be addressed through targeted training and resource support, fostering greater confidence in leveraging technology for sustainable financial management, as recommended by the World Bank Group (2021)."

8.3 Is there a significant relationship between the level of digital financial literacy and the financial health of the owners of microenterprises?

Table 9 Correlation Between Digital Financial Literacy and the Financial Health of the Owners of Micro Enterprises

INDEPENDENT VARIABLE (Digital Financial Literacy)	DEPENDENT VARIABLE (Financial Health)			
	Computed r-value	p-value at 0.05 alpha level	Decision	Interpretation
Digital Knowledge	0.68 (Substantial Positive Correlation)	0.000	Reject Null Hypothesis There is a significant relationship	Significant
Awareness to Digital Financial Services	0.67 (Substantial Positive Correlation)	0.000	Reject Null Hypothesis There is a significant relationship	Significant
Practical Know-how of Using Digital Financial Services	0.71 (Substantial Positive Correlation)	0.000	Reject Null Hypothesis There is a significant relationship	Significant
Ability to Avoid Digital Fraud	0.72 (Substantial Positive Correlation)	0.000	Reject Null Hypothesis There is a significant relationship	Significant

The table presents the correlation between various aspects of digital financial literacy (independent variables) and the financial health of microenterprise owners (dependent variables). All the independent variables show a substantial positive correlation with financial health, as indicated by the computed r-values ranging from 0.67 to 0.72.

Digital knowledge has a substantial positive correlation with financial health, with a computed r-value of 0.68 interpreted as "significant." This suggests that possessing digital knowledge significantly impacts the ability of micro-enterprise owners to improve their financial stability and management. Respondents with a strong understanding of digital technologies demonstrated significantly better financial health. This suggests that possessing digital literacy empowers micro-enterprise owners to make informed business decisions, access new markets, and improve their overall financial management. For instance, Useh (2017) found a significant positive correlation between digital knowledge and financial inclusion among micro-entrepreneurs in Nigeria, emphasizing the role of digital literacy in accessing financial services [49].

Also, awareness of digital financial services also has a strong positive impact, though slightly lower than digital knowledge, with a computed r-value of 0.67 interpreted as "significant." This implies that understanding the availability and utility of digital financial services contributes significantly to better financial health. Knowing about the availability and benefits of digital financial services, such as mobile banking, online

payments, and digital lending platforms, strongly correlated with improved financial health. This highlights the importance of educating micro-enterprise owners about the range of digital tools available to them. Similarly, KPMG International Limited (2021) highlighted the crucial role of digital financial awareness in improving financial health by enabling entrepreneurs to make informed decisions regarding digital financial products and services [50].

On the other hand, practical know-how shows a higher correlation compared to digital knowledge and awareness, with a 0.71 computed r-value interpreted as "significant," highlighting that the application of digital tools and services in real-world scenarios plays a crucial role in improving financial health. Respondents who actively utilize digital tools and services in their businesses, such as e-commerce platforms, online marketing, and digital bookkeeping, exhibited the strongest correlation with improved financial health. This emphasizes the critical role of practical application in translating digital knowledge into tangible financial benefits. Furthermore, the World Bank (2019) emphasized the importance of practical application of digital skills, such as e-commerce and online marketing, in enhancing business performance and financial stability [51].

And lastly, the strongest correlation is observed with the ability to avoid digital fraud, with a computed r-value of 0.72 interpreted as "significant." This suggests that effectively managing risks and preventing fraud has the most significant impact on the financial health of micro-enterprise owners. The strongest correlation was found between the ability to identify and prevent digital fraud, such as phishing scams and online data breaches, and improved financial health. This underscores the importance of cybersecurity awareness and measures to protect businesses from financial losses due to online threats. Finally, the strong correlation between fraud prevention and financial health is consistent with the findings of The Organization for Economic Cooperation and Development (2021), which underscored the significant financial risks associated with cyber threats and the importance of cybersecurity education for micro-entrepreneurs [52].

The p-values for all correlations are 0.000, which is below the significance level of 0.05, leading to the rejection of the null hypothesis. This indicates that there is a statistically significant relationship between digital financial literacy and financial health. According to Lusardi and Mitchell (2014), there is strong evidence for the link between financial literacy (which encompasses digital financial literacy) and various economic outcomes, including financial well-being. It synthesizes a significant body of research demonstrating that individuals with higher financial literacy tend to have better financial outcomes, such as higher savings rates, lower debt levels, and greater wealth accumulation [53].

Table 10 Correlation Between Digital Financial Literacy and the Financial Health of the Owners of Micro Enterprises

INDEPENDENT VARIABLE (Digital Financial Literacy)	DEPENDENT VARIABLE (Financial Health)			
	Computed r-value	**p-value at 0.05 alpha level**	**Decision**	**Interpretation**
DIGITAL FINANCIAL LITERACY VS. FINANCIAL HEALTH	0.75 (Substantial Positive Correlation)	0.000	Reject Null Hypothesis There is a significant relationship	Significant

The table presents the correlation between digital financial literacy as the independent variable and financial health as the dependent variable for microenterprise owners. The computed r-value of 0.75 indicates a substantial positive correlation and is "significant," which means that as digital financial literacy increases, financial health also tends to improve significantly. This suggests that as microenterprise owners gain a better understanding of digital financial tools and services, their businesses tend to experience improved financial performance. The associated p-value is 0.000, which is far below the significance level of 0.05. Many respondents reported that increased digital financial literacy helped them better track income and expenses, manage cash flow more effectively, and make more informed financial decisions. Respondents with higher digital financial literacy were more likely to be aware of and utilize digital lending platforms, access microloans, and explore alternative financing options. Many respondents indicated that digital tools and services helped them streamline operations, reduce transaction costs, and improve overall business efficiency, leading to improved profitability.

This confirms that the observed relationship is statistically significant. Based on this result, the null hypothesis, which states there is no relationship between digital financial literacy and financial health, is rejected. The study provides strong evidence that enhancing the digital financial literacy of microenterprise owners can significantly contribute to their financial well-being. According to Bushra (2024), by improving their understanding of digital financial tools and services, micro-enterprise owners can better manage their

finances, access credit and funding, and increase their business efficiency [54]. This is evident in their ability to track income and expenses, manage cash flow, utilize digital lending platforms, and streamline operations. Furthermore, a strong emphasis on cybersecurity, including measures like two-factor authentication and data privacy awareness, is crucial for mitigating risks and protecting their businesses from online threats.

Therefore, the study concludes that there is a significant positive relationship between digital financial literacy and financial health among the owners of microenterprises. This highlights the importance of investing in programs that educate micro-enterprise owners on digital financial concepts, tools, and best practices, empowering them to navigate the digital economy effectively and achieve greater financial success.

8.4. Based on the analysis, what strategy for digital financial literacy and financial health may be proposed?

Based on the lowest means in each of the four dimensions, strategies were proposed for the owners of the microenterprises. For digital knowledge, cloud computing is less frequently applied, and with that, workshops and seminars about cloud computing were proposed. The seminar and workshop will help the owners improve their ability to understand the use of cloud computing digital software. Community engagement and local campaigns were proposed for the second dimension, Awareness of Digital Financial Services, as the results showed that awareness of advancements in big data and cloud computing technologies is relatively lower. The proposed strategy will improve the familiarity of different digital financial services and make them aware of their new advancements. For practical know-how of using digital financial services, cloud-based financial systems are the least utilized or understood among respondents. The proposed strategy is hands-on training and seminars, as it will improve the execution of digital transactions and managing finances online for the owners of the microenterprises. For the ability to avoid digital fraud, cybersecurity education and awareness were proposed to improve the business' digital security and awareness of digital fraud, as the results showed that the role of cashless transactions in reducing fraud has the lowest mean score. As the results showed for the variable financial health, owners may recognize the importance of the role of digital accounting systems in ensuring sustainability, but there may be limited knowledge or practical implementation of such systems in their business operation. With that, the proposed strategy was to establish financial goals and continuous monitoring to improve the performance matrix and cash flow management of their business.

IX.   CONCLUSIONS AND RECOMMENDATIONS

Microenterprise owners in Calapan City demonstrated a moderate level of digital financial literacy across all assessed dimensions: digital knowledge, awareness of digital financial services, practical know-how, and ability to avoid digital fraud. Key strengths include strong knowledge of using digital tools for financial reporting and awareness of smartphone-based financial services. Areas for improvement include enhancing cloud computing knowledge, increasing awareness of big data and its applications, optimizing business operations through cloud-based systems and efficient reporting, and strengthening security through advanced technologies and secure authentication methods. Addressing these areas, microenterprise owners can enhance their digital skills, leverage data effectively, and optimize business operations, ultimately improving their financial health and competitiveness.

While microenterprise owners in Calapan City demonstrate a good foundation in digital financial literacy, there is significant potential for improvement, particularly in the area of digital accounting systems. To enhance financial health, it's crucial to address this gap. While owners recognize the importance of digital accounting systems, limited knowledge or practical implementation hinders their ability to improve decision-making and ensure sustainability. To address this, continuous improvement is essential. This includes guiding enhanced performance metrics and cash flow management while regularly assessing the effectiveness of training programs and adapting to evolving technologies.

This research demonstrates a significant relationship between digital financial literacy and the financial health of microenterprise owners in Calapan City. Enhancing digital financial literacy, encompassing digital knowledge, awareness of services, practical know-how, and the ability to avoid digital fraud, is crucial for improving their financial well-being. To further advance microenterprises, local governments and business organizations should collaborate to offer digitalization enhancement programs. These programs should leverage resources from the Department of Trade and Industry (DTI), such as free online talks, and adapt them into in-person training sessions. By focusing on practical skills, such as utilizing Microsoft templates and cloud computing applications like Google Cloud and CloudZero, these programs can empower micro-enterprise owners with the necessary tools to make informed financial decisions and thrive in the digital economy.

To enhance digital financial literacy and financial health among microenterprise owners in Calapan City, a comprehensive strategy is proposed. For digital knowledge, workshops and webinars on digital skills, including computer knowledge, internet usage, and software applications, to enhance decision-making. For awareness and practical know-how, community events and campaigns promoting the uses and benefits of digital financial services, such as Excel for inventories and data storage, for the ability to avoid fraud, and providing

best practices and tools to protect sensitive financial information and secure transactions. For financial health improvement, guide on improving performance metrics and cash flow management while regularly assessing the effectiveness of training programs and adapting to evolving technologies. This multifaceted approach will empower microenterprise owners with the necessary knowledge, skills, and tools to thrive in the digital economy.

Future research should delve deeper into the dimensions of digital financial literacy, moving beyond broad categories to examine specific competencies. Employing innovative methods like big data analytics and experimental studies will allow for a more nuanced understanding of the factors influencing digital financial literacy, including government policies, social and cultural impacts, and access to technology. These insights will be invaluable for policymakers, practitioners, and microenterprise owners in leveraging modern tools to enhance financial security and drive economic growth.

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Conflict of interest statement
The authors have no conflicts of interest to disclosure.

Statement of ethical approval
Approval was obtained from all parties involved before data collection to ensure the protection of the respondents' rights and well-being.

Statement of informed consent
Informed consent was obtained from all participants included in the study. They were provided with information about the research and its purpose, allowing them to voluntarily participate while keeping their identity anonymous.

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