THE INFLUENCE OF DIGITAL LITERACY ON CONSUMER PERCEPTIONS AND E-COMMERCE ENGAGEMENT

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ABSTRACT
This study investigates the influence of digital literacy, perceived usefulness, and perceived ease of use on online purchase intention among Internet users in Pakistan. An extended version of the Technology Acceptance Model (TAM) was applied, incorporating digital literacy as a key factor. A quantitative approach was used, with 298 participants completing a survey. The data were analyzed using Partial Least Squares Structural Equation Modeling (SEM-PLS) to test the proposed framework. The results show that digital literacy significantly impacts perceived usefulness, perceived ease of use, and online purchase intention. Higher levels of digital literacy lead to stronger perceptions of the perceived usefulness and ease of use and online shopping, which, in turn, enhance users' intention to purchase online. Both perceived usefulness and perceived ease of use were found to significantly affect online purchase intention, highlighting their roles in shaping users' online shopping behavior. This research emphasizes the importance of digital literacy in influencing online shopping. The findings suggest that improving digital literacy among Internet users can enhance their perception of online shopping platforms, encouraging more frequent online purchases. This has important implications for businesses and policymakers aiming to increase e-commerce adoption in Pakistan.
Keywords: *Digital Literacy, Perceived Usefulness, Perceived Ease of Use, Online Purchase Intention, Pakistan*

INTRODUCTION

The Internet has experienced remarkable growth in recent years, evolving into an indispensable tool for various aspects of modern life. It has proven to be highly effective and profitable, serving as a powerful medium for communication, a catalyst for the expansion of electronic commerce, and a key driver of sustainable business development. This rapid advancement has revolutionized how individuals and organizations connect, conduct transactions, and innovate, underscoring its critical role in shaping

the global economy and fostering long-term growth (Law et al., 2016).

The rapid increase in Internet penetration has significantly accelerated the global adoption of B2C e-commerce, providing businesses with opportunities to stay competitive by offering individuals a more convenient, faster, and cost-effective way to make purchases. This growth fosters new opportunities for companies and customers to exchange information and services, paving the way for innovative and sophisticated business models. Scholars have highlighted the proliferation of Internet-enabled devices, which allow individuals to easily search for information and purchase products or services online (Grewal et al., 2017). Consequently, advancements in Internet technology have profoundly transformed daily life, delivering numerous benefits to e-retailers, consumers, and the broader business landscape. The Internet has emerged as a pivotal driver of economic growth, facilitating the evolution of traditional business practices into efficient online shopping experiences (Ahmad et al., 2024).

Due to its low transaction costs, e-commerce has emerged as a key enabler of electronic transactions, leveraging information and communications technology (ICT) to make these transactions more accessible, convenient, and time-efficient. Among the most notable benefits of ICT advancements is online shopping, a form of e-commerce that enables consumers to purchase goods or services directly from sellers via the Internet using web browsers or mobile apps. Research has shown that online shopping is an efficient shopping method, offering time savings, greater practicality, convenience compared to traditional shopping, and a novel shopping experience (Ganesh et al., 2010). While online shopping has been well-established in developed countries for nearly two decades, it remains in its early stages in many developing countries (Alyoubi, 2015).

Purchase intention toward online shopping has become a prominent research focus in B2C e-commerce over the past decade. It serves as a key indicator of the extent to which consumers are willing to engage in a particular behavior (Ajzen, 1991). Measuring purchase intentions offers a more accurate understanding of consumer mindset than analyzing actual purchasing behavior, which is often constrained by various external factors (Day, 1976). Consequently, purchase intentions reflect the strength of an individual's attitude and willingness to shop online. Online buying behavior is shaped by how consumers decide which products or services to purchase, a process guided by the cognitive state referred to as purchase intention. A review of the literature indicates that most scholars define online purchase intention in similar terms. For instance, Pavlou (2003) describes it as the desire and intent to buy goods or services via the Internet.

The transaction value in Pakistan's digital commerce market is projected to reach $10.89 billion in 2024. The number of users in Pakistan's digital commerce market is expected to reach 14.03 million by 2029. The average transaction value per user in Pakistan's digital commerce market is expected to reach $1.58 thousand in 2024. The annual growth rate (CAGR) for Pakistan's digital commerce market is expected to be 23.68% from 2024 to 2029. Pakistan's e-commerce revenue is projected to reach $5,035 million in 2024. User penetration in Pakistan's e-commerce market is expected to reach 10% in 2024 and 12.5% by 2029. The average revenue per user (ARPU) in Pakistan's e-commerce market is expected to reach $728.60. Over 80% of internet users in Pakistan access the web through smartphones. In 2023, 58% of e-commerce users in Pakistan made purchases using mobile devices. Cash on delivery (COD) is the most common payment method in Pakistan's e-commerce sector, accounting for over 94.7% of all transactions.

Many substantial previous studies have investigated the influence of various factors on individuals' online purchase intentions. For example, perceived ease of use (Nasution et al., 2019), perceived usefulness (Jin, 2016; Nasution et al., 2019; Ha et al., 2021), computer self-efficacy (Ranganathan & Jha, 2009), perceived risk (Tham et al., 2019), perceived risk (Tham et al., 2019; Ha et al., 2021), and self-efficacy (Phong et al., 2018). Based on these previous studies, it appears that there is a lack of clarity and consistency in terms of the factors that influence

purchase intention in e-commerce. A major challenge faced by e-retailers is influencing individuals' purchase intentions to shop online, especially among Internet users. To address both empirical and knowledge gaps, this study introduces a novel model that incorporates variables to explore the factors preventing Pakistan Internet users from shopping online.

This study aims to explore the impact of digital literacy, perceived usefulness, and perceived ease of use on Internet users' intention to shop online. Additionally, the study will assess whether digital literacy, perceived usefulness and perceived ease of use impact on consumer online purchase intention. Moreover, there is a limited amount of research on individuals' purchase intentions regarding online shopping, particularly within the context of Pakistan. Given that online shopping is still in its early stages in Pakistan, it is essential to investigate the factors influencing individuals' online shopping intentions in this context.

This study extends the Technology Acceptance Model (TAM) by incorporating the construct of digital literacy to address the specified objectives. In this current research the researcher used Structural Equation Modeling (SEM) technique with Partial Least Squares (PLS) approach for testing the hypothesis.

2. Literature Review
2.1 Online Purchase Intention
With the widespread availability of the Internet and significant technological advancements, online shopping has become an integral part of individuals' lives. This shift toward e-commerce has profoundly influenced consumer purchasing behavior and decision-making processes, creating both opportunities and challenges for understanding online shopping intentions. Researchers in the fields of business, particularly marketing and management, have increasingly focused on individual purchase intention as a critical factor for study. Studies have shown that factors such as perceived convenience, trust, and usability play pivotal roles in shaping consumer intentions to shop online (Chiu et al., 2014; Pavlou, 2003). This growing body of research underscores the need to explore the dynamic interaction between technology, consumer behavior, and market trends in the digital era. In this context, an individual's intention to shop online reflects their willingness to seek relevant information and choose preferred products or services (Wang et al., 2015). Numerous empirical studies in the field of online shopping research have highlighted the importance of individuals' intentions to adopt online shopping. Additionally, these studies have identified various factors that influence online purchase intentions.

2.2 Digital Literacy
Access to technology alone does not ensure that individuals will achieve the desired socioeconomic outcomes. To effectively and critically engage with IT systems, such as e-commerce, individuals must possess specific foundational skills and understanding. Digital literacy refers to the ability to find, evaluate, and communicate information clearly across various digital platforms, including typing and other media. It encompasses an individual's awareness, attitude, and proficiency in using digital tools to identify, access, manage, integrate, assess, analyze, and synthesize digital resources. Additionally, digital literacy involves creating new knowledge, producing media, and communicating with others in relevant contexts, all aimed at fostering constructive social action and reflecting on this process. Essentially, a digitally literate person is someone who can accurately interpret and apply information through ICT, using it to advance their personal goals.

Meyers et al. (2013) also emphasized that individuals who lack digital literacy are less likely to excel as students, be motivated employees, or engage effectively in technological areas like e-learning, e-commerce, e-government, and e-health. Overall, digital literacy plays a crucial role in fostering the development of business and marketing networks.

The digital literacy framework is a comprehensive model for assessing an individual's digital literacy, encompassing three interconnected concepts: cognitive, technical, and socio-emotional. These concepts interact with and influence each other. An individual with strong digital literacy skills should possess operational and technical abilities, engage in critical thinking to evaluate digital

content, and use the internet safely for work, education, and everyday activities. Callum and Jeffrey (2014) highlighted the significance of digital literacy in the adoption of mobile learning technologies. Additionally, Nawafleh (2018) demonstrated that digital literacy plays a positive and significant role in enhancing individuals' intention to utilize e-government services.

H1: Digital literacy has a positive and significant effect on perceived usefulness

H2: Digital literacy has a positive and significant effect on perceived ease of use

H3: Digital literacy has a positive effect on online purchase intention.

2.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis et al. (1989), is one of the most widely used frameworks for examining the factors that influence an individual's attitude, intention, and willingness to adopt new technologies or systems, especially in the context of information systems. According to TAM, two key factors—perceived usefulness (PU) and perceived ease of use (PEOU)—shape individuals' attitudes, intentions, and behaviors toward adopting a particular technology or system. The model has been empirically validated, with studies like Pavlou (2003) demonstrating its ability to predict individual behavior in e-commerce settings. This research suggests that TAM can effectively explain and predict the adoption of online shopping. Additionally, as noted by Tahar et al. (2020), perceived ease of use and perceived usefulness together influence attitudes toward technology, which in turn affects behavioral intentions and leads to the actual use of the system.

2.4 Perceived Usefulness (PU)

The perceived usefulness of an information system is a key predictor of individuals' initial

Figure 2.1: Conceptual Framework

intentions to adopt it (Davis et al., 1989). It refers to the extent to which a person believes that using a specific system will improve their job performance (Davis et al., 1989; Zhu et al., 2009). Information technology in developing countries, such as Pakistan, is still in its infancy compared to developed nations. Therefore, this study explores perceived usefulness as a potential factor influencing individuals' intentions to shop online in Pakistan, where e-commerce remains in its early stages.

Most of the existing research on perceived usefulness has been conducted in developing countries (Zhao & Cao, 2012; Nguyen & Barrett, 2006). Studies by Rehman (2019) and Ha et al. (2021) found that perceived usefulness has a positive and significant impact on consumer purchase intentions.

H4: Perceived usefulness has a positive effect on online purchase intention.

2.5 Perceived Ease of Use (PEOU)

Davis et al. (1989) defined perceived ease of use as the extent to which a person believes that using a specific system would require minimal effort. In essence, it refers to an individual's belief that a technology or information system is easy to understand and use. Perceived ease of use is, therefore, a subjective assessment of the amount of effort needed to adopt a new information system. Several studies have explored the causal relationship between perceived ease of use and an individual's intention to make online purchases, consistently showing that perceived ease of use positively influences online purchase intention (e.g., Jin, 2016; Nasution et al., 2019; Pavlou, 2003).

H5: Perceived ease of use has a positive effect on online purchase intention.
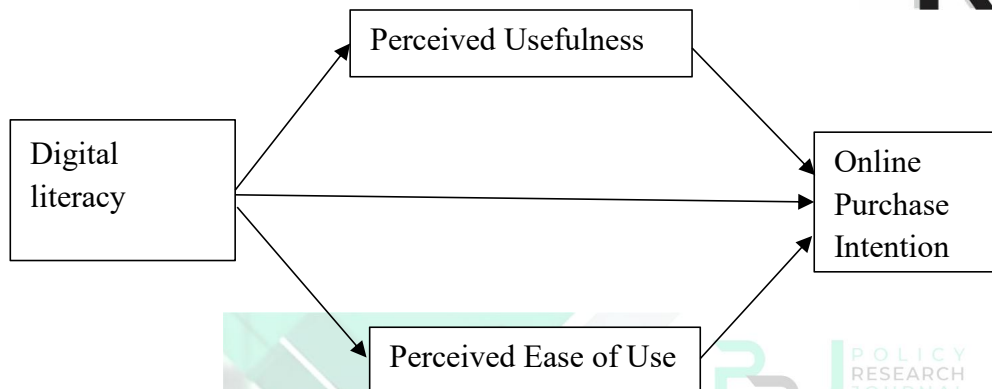
3.1 Methodology

The research methodology of this study encompasses two primary components: data collection and data analysis. The research design plays a crucial role in guiding the study, outlining the procedures for gathering, measuring, and analyzing data to address the research questions. This study aims to investigate the influence of digital literacy, perceived usefulness, and perceived ease of use on online purchasing intentions. The research model was tested using a sample of internet users in Pakistan. A quantitative approach was employed.

The study's population consists of Pakistan Internet users. Data was collected through 298 questionnaires completed by Pakistan of diverse backgrounds, ages, income levels, genders, and varying daily Internet usage. Consequently, the research sample will include university academics, students, administrative staff, employees from various ministries, and individuals from households.

A set of measurement indicators was applied to the context of this research based on the hypothesized research framework developed through a detailed reviewing of prior literature. All of the instrument of measurement is adopted from different sources like digital literacy adopted from Nguyen and Barrett, (2006); Perceived Usefulness adopted from Ramayah, (2009); Perceived Ease of Use adopted from Lim and Ting, (2012); Davis, (1989); Purchase Intention adopted from Chiu (2009); Chauhan (2019). All of the variable scale included in appendix section table 8.1. The respondents' responses to each of the items of the survey were measured using a 5-point Likert. Two software was used in this research SPSS and Smart Pls. SPSS used for demographics and Smart Pls used for measurement and structural model. These are the demographics variables show on table 3.1.

Table 3.1: Demographics profile

Profile	Distribution	Frequency	Percentage
Age	18-30	94	31.54%
	31-40	108	36.24%
	41-50	67	22.48%
	Above 50	29	9.73%
	Total	298	100%
Gender	Male	176	50.06%
	Female	122	40.93%
	Total	298	100%
Marital status	Single	188	63.08%
	Married	110	36.91%
	Total	298	100%
Education	Intermediate	81	27.18%
	Bachelor	112	37.58%

Profile	Distribution	Frequency	Percentage
	Master	57	19.12%
	Other	48	16.10%
	Total	298	100%
Experience	1 year	68	22.81%
	2 year	81	27.18%
	3 year	74	24.83%
	4 year	44	14.76%
	5 year or Above	31	10.40%
	Total	298	100%
Income Level	50k-100k	154	51.67%
	101k- 150k	83	27.85%
	151k or Above	61	20.46%
	Total	298	100%

4 Results and Discussion

4.1 Measurement Model

The table presents the reliability and validity statistics for four constructs: **DL**, **PEOU**, **PI**, and **PU**. Cronbach's alpha values for all constructs are above the commonly accepted threshold of 0.7, indicating high internal consistency (DL = 0.902, PEOU = 0.853, PI = 0.882, PU = 0.835). Similarly, the composite reliability (rho_a and rho_c) values are all above 0.7, confirming the reliability of the measurement models (rho_a ranges from 0.838 to 0.905, while rho_c ranges from 0.885 to 0.920). Furthermore, the average variance extracted (AVE) values are all above 0.5 (DL = 0.565, PEOU = 0.696, PI = 0.677, PU = 0.607), indicating sufficient convergent validity, as each construct explains more than half of the variance in its indicators. These results collectively demonstrate that the constructs exhibit strong reliability and validity. All of the values show in table 4.1.

Table 4.1 Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
DL	0.902	0.905	0.920	0.565
PEOU	0.853	0.854	0.901	0.696
PI	0.882	0.889	0.913	0.677
PU	0.835	0.838	0.885	0.607

4.2 Heterotrait-monotrait ratio (HTMT)

The Heterotrait-Monotrait (HTMT) ratio table provides insights into the discriminant validity of constructs in a model by evaluating the degree of similarity between constructs. Discriminant validity is established when the HTMT values are below a recommended threshold, typically 0.85 or 0.90. In this table, the relationships among four constructs—Digital Literacy (DL), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Purchase Intention (PI)—are reported. The HTMT values between DL and other constructs are relatively low: 0.234 with PEOU, 0.260 with PI, and 0.213 with PU, indicating a clear distinction between DL and these constructs. Similarly, PEOU shows moderate relationships with PI (0.507) and PU (0.621). The relationship between PI and PU is also moderate at 0.424.

All reported HTMT values fall below the commonly accepted threshold of 0.85, suggesting that the constructs in this model demonstrate adequate discriminant validity. Heterotrait-monotrait ratio (HTMT) values show in table 4.2.

Table 4.2 Heterotrait-monotrait ratio (HTMT)

	DL	PEOU	PI	PU
DL				
PEOU	**0.234**			
PI	0.260	**0.507**		
PU	0.213	0.621	**0.424**	

4.3 Fornell-Larcker criterion

The Fornell-Larcker criterion table provides an assessment of discriminant validity by comparing the square roots of the Average Variance Extracted (AVE) values (on the diagonal) with the inter-construct correlations (off-diagonal). In this table, the square root of the AVE for each construct is presented along the diagonal: **DL (0.752)**, **PEOU (0.834)**, **PI (0.823)**, and **PU (0.779)**. These values are higher than their corresponding inter-construct correlations in the off-diagonal cells, indicating that each construct shares more variance with its own indicators than with other constructs. Specifically, the inter-construct correlations range from 0.190 (between DL and PU) to 0.531 (between PEOU and PU), all of which are below the diagonal values. This confirms the discriminant validity of the constructs, supporting the notion that they are distinct from each other in the model. All of the Fornell-Larcker Creation values show in below table 4.3.

Table 4.3: Fornell-Larcker criterion

	DL	PEOU	PI	PU
DL	**0.752**			
PEOU	0.211	**0.834**		
PI	0.240	0.450	**0.823**	
PU	0.190	0.531	0.369	**0.779**

4.4 Path Coefficient

The table provides statistical results for the relationships between various constructs, with the original sample (O), sample mean (M), standard deviation (STDEV), T-statistics (|O/STDEV|), and P-values presented for each path. The relationship between Digital Literacy (DL) and Perceived Ease of Use (PEOU) is significant, with a path coefficient (O) of 0.211, a sample mean of 0.223, and a T-statistic of 3.193 (p = 0.001). Similarly, DL has a significant positive effect on Perceived Usefulness (PU) (O = 0.190, T = 2.584, p = 0.010) and Purchase Intention (PI) (O = 0.138, T = 2.141, p = 0.032).

Perceived Ease of Use (PEOU) shows a strong influence on PI, with a path coefficient of 0.333 and a highly significant T-statistic of 5.080 (p < 0.001). Additionally, PU positively impacts PI (O = 0.166, T = 2.243, p = 0.025). These results indicate that DL plays a crucial role in shaping PEOU, PU, and PI, while PEOU and PU significantly contribute to PI. All relationships exhibit statistical significance with P-values below the 0.05 threshold.

Table 4.4: Path Coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
DL -> PEOU	0.211	0.223	0.066	3.193	0.001
DL -> PI	0.138	0.142	0.065	2.141	0.032
DL -> PU	0.190	0.203	0.074	2.584	0.010
PEOU -> PI	0.333	0.334	0.066	5.080	0.000
PU -> PI	0.166	0.169	0.074	2.243	0.025

4.5 Structural Model

Figure 4.1: Structural Model
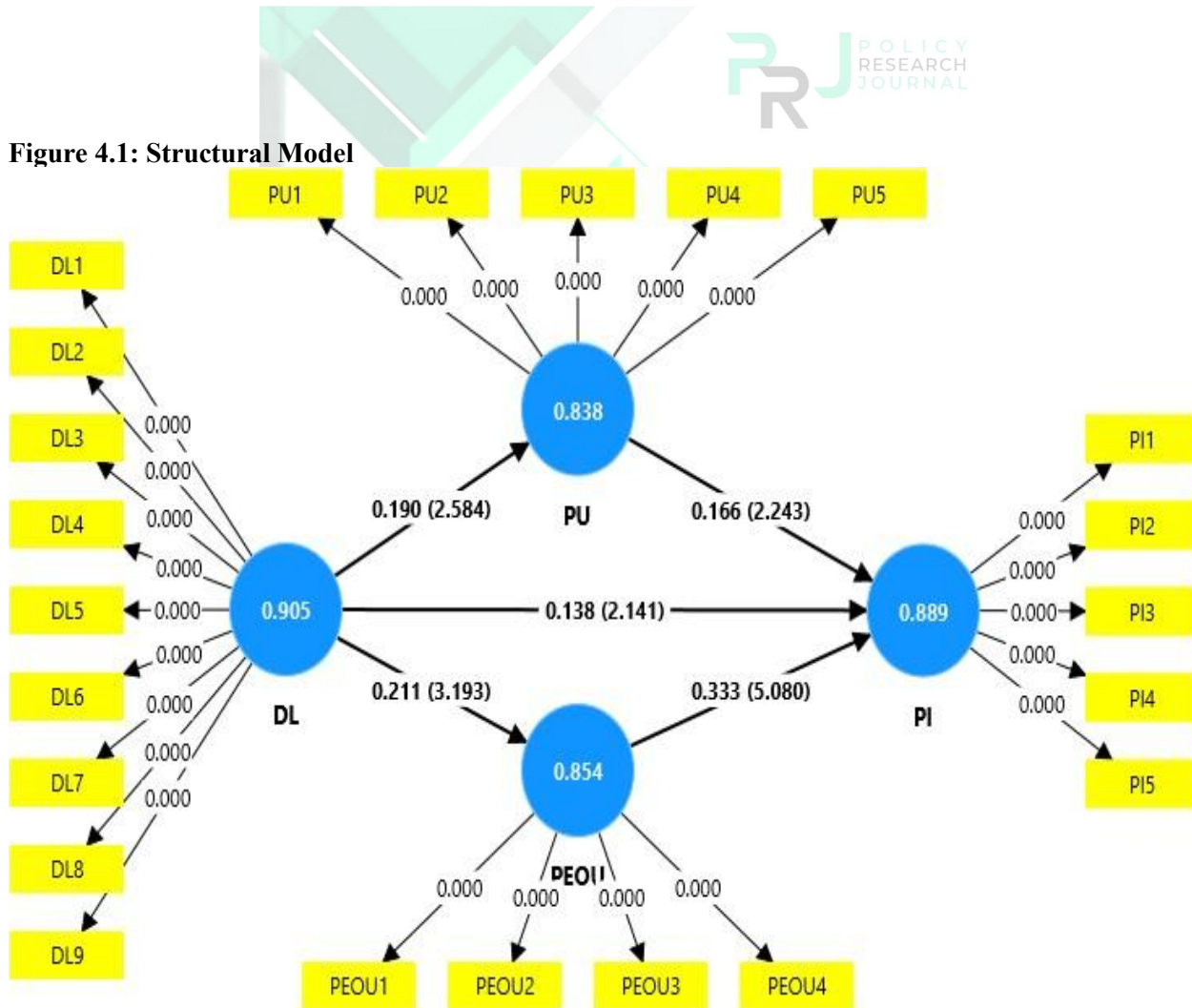
5. Implications
5.1 Theoretical Implications
The primary contribution of this study lies in the development of a conceptual framework that assesses the impact of digital literacy on online purchase intention, both directly and indirectly. This framework adds to the academic literature by highlighting the critical role of digital literacy as a significant determinant of online shopping behavior. By doing so, the study enriches the understanding of how digital competencies influence consumer decision-making in digital environments, particularly in developing regions like Pakistan.

5.2 Managerial Implications
From a managerial perspective, the study provides valuable insights for online retailers. It identifies

digital literacy as a key factor influencing the online purchase intentions of Internet users. Based on these findings, online retailers in Pakistan should prioritize initiatives aimed at enhancing digital literacy among their target audience. This could involve educational campaigns, simplified user interfaces, and targeted marketing strategies designed to build users' confidence and skills in navigating online shopping platforms. By addressing these aspects, retailers can effectively encourage non-purchasing Internet users to engage in online shopping and broaden their customer base.

6. Conclusion, Future Research and Limitation

Future research on the impact of digital literacy on perceived usefulness, ease of use, and online purchase behavior could explore the role of different demographics in shaping these relationships. Studies could investigate how factors such as age, education level, and socioeconomic status influence digital literacy and its subsequent effect on e-commerce experiences. Additionally, future research could focus on examining specific digital tools or platforms to assess how variations in user interface design and functionality interact with levels of digital literacy. This would offer a more nuanced understanding of how different digital environments may amplify or mitigate the impact of digital literacy on perceived ease of use and purchase decisions. Researchers could also explore the longitudinal effects of improving digital literacy over time, investigating whether enhanced digital skills lead to more frequent or higher-value online purchases. One limitation of this research is the potential for self-reporting bias, as participants' perceptions of digital literacy and their online purchasing habits may not fully reflect their actual behavior. Digital literacy is a broad concept, and measuring it in a standardized way across different contexts and populations can be challenging. Moreover, cultural differences in digital literacy may also limit the generalizability of findings from one region or country to another. Another limitation lies in the dynamic nature of digital technologies, where rapid changes in online platforms, devices, and e-commerce practices may render current research quickly outdated. Thus, the fast-evolving digital landscape may pose challenges in establishing long-term, consistent patterns in the relationship between digital literacy and online purchase behavior.

7. REFERENCES

Ahmad, S., Wong, W. K., Riaz, S., & Iqbal, A. (2024). The role of employee motivation and its impact on productivity in modern workplaces while applying human resource management policies. *Arabian Journal of Business and Management Review (Kuwait Chapter)*, *13*(2), 7-12.

Ahmed, A., Rahman, S., Islam, M., Chowdhury, F., & Badhan, I. A. (2023). Challenges and Opportunities in Implementing Machine Learning For Healthcare Supply Chain Optimization: A Data-Driven Examination. *International journal of business and management sciences*, *3*(07), 6-31.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 211(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alyoubi, A. A. (2015). E-commerce in developing countries and how to develop them during the introduction of modern systems. Procedia Computer Science, 65(1), 479–483. https://doi.org/10.1016/j.procs.2015.09.127

Badhan, I. A., Hasnain, M. N., & Rahman, M. H. (2023). Advancing Operational Efficiency: An In-Depth Study Of Machine Learning Applications In Industrial Automation. *Policy Research Journal*, *1*(2), 21-41.

Badhan, I. A., Neeroj, M. H., & Rahman, S. (2024). CURRENCY RATE FLUCTUATIONS AND THEIR IMPACT ON SUPPLY CHAIN RISK MANAGEMENT: AN EMPIRICAL ANALYSIS. *International journal of business and management sciences*, *4*(10), 6-26.

Callum, K. M., & Jeffrey, L. (2014). Factors impacting teachers. Adoption of Mobile Learning, 13(1), 141–162. http://

www.jite.org/documents/Vol13/JITEv13 ResearchP141_162MacCallum0455.pdf

Chauhan, S. (2019). The impact of website quality and reputation on purchasing intention towards online shopping. Journal of Content, Community & Communication, 10(1), 1–8. https://doi. org/ 10.31620/JCCC.12.19/15

Chiu, C. M. (2009). Determinants of customer repurchase intention in online shopping. Online Information Review, 33(4), 761–784. https://doi.org/10.1108/146845209109857 10

Chiu, C.-M., Wang, E. T. G., Fang, Y.-H., & Huang, H.-Y. (2014). Understanding customers' repeat purchase intentions in B2C e-commerce: The roles of utilitarian value, hedonic value, and perceived risk. *Information Systems Journal, 24*(1), 85-114.

Chung, J. E. (2010). Age differences in perceptions of online community participation among non-users: An extension of the technology acceptance model. Computers in Human Behavior, 26(6), 1674–1684. https://doi.org/10.1016/j.chb.2010.06.016

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Sciences, 35(8), 982–1003. https://www.researchgate.net/publication/ 227446117

Day, G. S. (1976). Mathematical models in marketing. Heidelberg, Berlin: Springer-Verlag.

Elhajjar, S., & Ouaida, F. (2019). An analysis of factors affecting mobile banking adoption. International Journal of Bank Marketing, 38(2), 352–367. https://doi.org/10.1108/IJBM-02 2019-0055

Feriady, M. (2020). Influence of organizational support and digital literacy on lecturer acceptance of e-learning in Indonesia: A modification of technology acceptance

model. International Journal of Scientific & Technology Research, 9(01), 1–5.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement. Journal of Marketing Research, 38(2), 39–50. https://www.jstor.org/ stable/3151312

Ganesh, J. (2010). Online shopper motivations and e-store attri bute: An examination of online patronage behavior and shopper typologies. Journal of Retailing, 86(1), 106–115. https://doi.org/10.1016/j.jretai.2010.01.00 3

Grewal, D., Roggeveen, A. L., & Nordfält, J. (2017). The future of retailing. Journal of Retailing, 93(1), 1–6. https://doi. org/10.1016/j.jretai.2016.12.008

Hair, J. F. (2010). Multivariate data analysis. New York: Pearson Education.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results, and higher acceptance. Long Range Planning, 46(1–2), 1–12. https://doi.org/10.1016/j.lrp.2013.01.001

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2016). A primer on partial least squares structural equation modeling (PLS-SEM). Thousand Oaks, CA: Sage Publications.

Hulland, J. (1999). A new antihypertensive drug ameliorates insulin resistance. Acta Pharmacologica Sinica, 33(4), 429–430. https://doi.org/10.1038/aps.2012.31

Jackson, T. W., & Farzaneh, P. (2012). Theory-based model of factors affecting information overload. International Journal of Information Management, 32(1), 523–532. https://doi. org/10.1016/j.ijinfomgt.2012.04.006

Jin, Y. (2016). Factors influencing online shopping behavior: The mediating role of purchase intention. Procedia Economics and Finance, 12(1), 401–410. https://doi/org/10.1016/S2212 5671(16)00050-2

Law, M., Kwok, R. C., & Ng, M. (2016). Electronic commerce research and

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applications: An extended online purchase intention model for middle-aged online users. Electronic Commerce Research and Applications. Elsevier, 20(1), 132–146. https://doi.org/10.1016/j.elerap.2016.10.005

Lim, W. M., & Ting, D. H. (2012). E-shopping: An analysis of the technology acceptance model. Modern Applied Science, 6(4), 49–62. https://doi.org/10.5539/mas.v6n4p49

Meyers, E. M., Erickson, I., & Small, R. V. (2013). Digital literacy and informal learning environments: An introduction. Learning, Media and Technology, 38(4), 355–367. https://doi.org/10.1080/17439884.2013.783597

Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing workforce. Personnel Psychology, 53(2), 375–403. https://doi.org/10.1111/j.1744-6570.2000.tb00206.x

Nasution, M. D. T. P. (2019). An empirical examination of the factors influencing consumer's purchase intention toward online shopping. Journal of Business & Retail Management Research, 13(04), 14–30. https://doi.org/10.24052/jbrmr/ v13is04/art-02

Nawafleh, S. (2018). Factors affecting the continued use of e-government websites by citizens: An exploratory study in the Jordanian. Transforming Government People Process and Policy, 12(3/4), 244–264. https://doi.org/10.1108/TG-02-2018 0015

Nguyen, T. D., & Barrett, N. J. (2006). The adoption of the internet by export firms in transitional markets. Asia Pacific Journal of Marketing and Logistics, 18(1), 29–42. https://doi. org/10.1108/13555850610641073

Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce, 7*(3), 101-134.

Pavlou, P. A. (2003). Integrating trust and risk with the technology acceptance model. International Journal of Electronic Commerce, 7(1), 101–134. https://doi.org/10.1080/10864415.2003.11044275

Phong, N. D., Khoi, N. H., & Nhat-Hanh Le, A. (2018). Factors affecting mobile shopping: A Vietnamese perspective. Journal of Asian Business and Economic Studies, 25(2), 186–205. https://doi.org/10.1108/jabes-05-2018-0012

Rahman, S., Alve, S. E., Islam, M. S., Dutta, S., Islam, M. M., Ahmed, A., ... & Kamruzzaman, M. (2024). Understanding The Role Of Enhanced Public Health Monitoring Systems: A Survey On Technological Integration And Public Health Benefits. *Frontline Marketing, Management and Economics Journal*, *4*(10), 16-49.

Ramayah, T. (2009). A decomposed theory of reasoned action to explain intention to use Internet stock trading among Malaysian investors. Computers in Human Behavior, 25(6), 1222–1230. https://doi.org/10.1016/j.chb.2009.06.007

Ranganathan, C., & Jha, S. (2009). Examining online purchase intentions in B2C e-commerce: Testing an integrated model. Comparison-Shopping Services and Agent Designs, 20(4), 217–234. https://doi.org/10.4018/978-1-59904-978-6.ch014

Rehman, S. U. (2019). The moderating role of trust and commitment between consumer purchase intention and online shopping behavior in the context of Pakistan. Journal of Global Entrepreneurship Research, 9(1), 25–32. https://doi. org/10.1186/s40497-019-0166-2

Roussos, P. (2007). The Greek computer attitudes scale: Construction and assessment of psychometric properties. Computers in Human Behavior, 23(1), 578–590. https://doi. org/10.1016/j.chb.2004.10.027

Shin, D. H. (2009). Towards an understanding of the consumer acceptance of mobile

wallets. Computers in Human Behavior, 25(6), 1343–1354. https://doi.org/10.1016/j.chb. 2009.06.001.

Tham, K. W., Dastane, O., Johari, Z., & Ismail, N. B. (2019). Perceived risk factors affecting consumers' online shopping behavior. Journal of Asian Finance, Economics, and Busi ness, 6(4), 246–260. https://doi.org/10.13106/jafeb.2019.vol6. no4.246

Trocchia, P. J., & Janda, S. (2000). A phenomenological investigation of Internet usage among older individuals. Journal of Consumer Marketing, 17(7), 605–614. https://doi. org/10.1108/07363760010357804

Wang, C., & Chen, C. (2009). The impact of knowledge and trust on e-consumers' online shopping activities: An empirical study. Journals of Computer, 4(1) 11–18. http://www.jcomputers.us/ vol4/jcp0401-02.pdf

Wang, L., Law, R., Guillet, B. D., Hung, K., & Fong, D.K.C. (2015). Impact of hotel website quality on online booking

intentions: eTrust as a mediator. International Journal of Hospitality Management, 47, 108-115. http://doi.org/10.1016/j.ijhm.2015.03.012.

Zhao, Z., & Cao, Q. (2012). An empirical study on continual usage intention of microblogging: The case of Sina. Nankai Business Review International, 3(4), 413–429. https://doi. org/10.1108/20408741211283755

Zhu, Y., Basil, D. Z., & Hunter, M. G. (2009). The extended website stage model: A study of Canadian winery websites. Canadian Journal of Administrative Sciences, 26(4), 286–300. https://doi. org/10.1002/CJAS.118

Zohora, F. T., Parveen, R., Nishan, A., Haque, M. R., & Rahman, S. (2024). Optimizing Credit Card Security Using Consumer Behavior Data: A Big Data And Machine Learning Approach To Fraud Detection. *Frontline Marketing, Management and Economics Journal*, *4*(12), 26-60.

8. Appendix

Table 8.1: Constructs, Items, and Source

Construct	Items	Source
Digital Literacy (DL)	**DL1.** I know how to solve my own technical problems. **DL2.** I can learn new technologies easily. **DL3.** I keep up with important new technologies. **DL4.** I know about a lot of different technologies. **DL5.** I have the technical skills I need to use ICT for learning and to create artifacts (e.g. presentations, wikis, and blogs) that demonstrate my understanding of what I have learned. **DL6.** I am confident with my search and evaluation skills in regard to obtaining information from the website. **DL7.** I am familiar with issues related to web-based activities e.g. cyber safety, search issues, plagiarism. **DL8.** I frequently obtain help with my university work from my friends over the Internet e.g. through Skype, Facebook, Blogs. **DL9.** ICT enables me to collaborate better with my peers on online shopping and other learning activities.	Nguyen and Barrett (2006)
Perceived Usefulness (PU)	**PU1.** I am able to accomplish my shopping goals more quickly when I shop online (e.g. search for any buy). **PU2.** I am able to improve my shopping performance when I shop online (e.g. save time or money). **PU3.** I am able to increase my shopping productivity when I shop online (e.g. make purchase decisions or find product	Ramayah (2009)

	information within the shortest time frame). **PU4.** I am able to increase my shopping effectiveness when I shop online (e.g. get the best deal or find the most information about a product). **PU5**. Shopping from online retailers makes it easier for me to satisfy my needs.	
Perceived Ease of Use (PEOU)	**PEOU1.** I find it easy to use most online shopping websites to find what I want. **PEOU2**. I am able to browse online shopping websites with ease. **PEOU3.** I find it easier to compare products when shopping at online retailers. **PEOU4.** I feel that most online shopping websites are flexible to interact with.	Lim and Ting (2012); Davis (1989);
Purchase Intention (PI)	**PI1.** I intend to purchase products from online shopping websites in the future. **PI2.** When I need to buy a particular product, I would search for an online shopping website that has the product. **PI3**. There is a substantial chance that I would purchase the same product from an online shopping website. **PI4.** I am likely to recommend online shopping to my friends. **PI5.** I am very likely to provide the online shopping websites with my personal information it needs to better serve my needs	Chiu (2009); Chauhan (2019)

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