Contemporary Issues in Social Sciences and Management Practices (CISSMP)
ISSN: 2959-1023
Volume 4, Issue 4, December 2025, Pages 414-430
Journal DOI: 10.61503
Journal Homepage: https://www.cissmp.com

Digital Literacy, Social Networks, and Digital Marketing among Informal Micro-Enterprises

[1]Fahad Naeem, [2]Muhammad Saad Hassan & [3]Kamran Aslam
[1]Department of Management Sciences, Bahria University, Lahore Campus, Pakistan
[2]Department of Management Sciences, Virtual University of Pakistan
[3]M.Phil. Commerce, Directorate of Distance Education, Bahauddin Zakariya University, Multan, Pakistan; School Education Department, Government of Punjab, Pakistan

ABSTRACT

Article History:
Received: Aug 20, 2025
Revised: Sep 13, 2025
Accepted: Oct 19, 2025
Available Online: Dec 30, 2025

Keywords: Digital Marketing Adoption, Informal Sector, Micro-Enterprises, Digital Literacy, Social Networks

Funding:
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

In Pakistan, informal micro business is responsible for 72.1% non-agricultural jobs. However, digital marketing research has been almost exclusively conducted with registered small and medium enterprises. This study focuses on the influence of digital literacy and formal education and social network ties in the adoption of digital marketing by informal micro-enterprises. I t also examines whether the effectiveness of the marketing is increased by adoption. It is an analysis of a face-to-face cross-sectional survey of 312 owner-managers in Urdu. They operated in commercial clusters of Layyah and Kotsultan with up to 10 workers and their enterprises were either unregistered or partially registered. The respondents were selected by using stratified purposive sampling. Partial least squares structural equation modelling was used to analyses the data, using 10,000 bootstrap subsamples. Nearly all people have access to a smartphone (94.2%) as illustrated by the results. The use was much less, and only 36.5% have an active WhatsApp Business catalogue. Digital literacy ($\beta = .38$, $p < .001$) and social network ties ($\beta = .31$, $p < .001$) predicted adoption. There was no significant direct effect of formal education ($\beta = .06$, $p = .263$). The model accounted for 41% of the variance in both adoption and effectiveness. These findings suggest that access is no longer the main barrier to digital marketing in informal enterprises. Now, capability and learning through networks are important.

© 2022 The Authors, Published by CISSMP. This is an Open Access article under the Creative Common Attribution Non-Commercial 4.0

Corresponding Author's Email: contact.mshassan@gmail.com
DOI: https://doi.org/10.61503/cissmp.v4i4.429
Citation: Naeem, F., Hassan, M. S., & Aslam, K. (2025). Digital Literacy, Social Networks, and Digital Marketing among Informal Micro-Enterprises. *Contemporary Issues in Social Sciences and Management Practices*, 4(4), 414-430.

1.0 Introduction

The urban economy in Pakistan is dominated by small, unregistered enterprises. According to Pakistan Bureau of Statistics (PBS, 2025), 72.1% of employment in non-agriculture sector is informal. This share has hardly changed over the last few Labor Force Surveys. There are millions of kiryana stores, tailoring and garment making shops, food stalls, mobile-repair counters and beauty parlors behind the figure. They are working in business areas in Lahore, Karachi and other cities. These businesses take up jobs that the formal sector won't. They provide credit and goods to low-income households and are the first step on the entrepreneurial ladder for migrants, women and young workers. Thus, their productivity has a direct impact on household welfare and overall structural transformation of the economy (Chughtai et al., 2022).

The digital landscape of these companies is rapidly evolving. According to the Pakistan Telecommunication Authority (PTA, 2025), the number of broadband subscriptions surpassed 150 million in 2024-25, and penetration is over 60%. Digital payment has become common in the streets through mobile wallets like JazzCash and Easypaisa. Today, WhatsApp, Facebook and TikTok provide virtually-free platforms for showcasing products, processing orders, and communicating with customers. In theory, these tools can allow even the smallest company to transcend the confines of a single bazaar. However, emerging evidence indicates that many informal businesses are digitally available but passively using the digital space. They have an account but do not use it as marketing (Shakir, 2026).

In this study the population is the informal micro-enterprises. They are privately held, non-agricultural enterprises with 10 or less employees that are either partially registered with tax, municipal or labor authorities or not registered at all. The definition is based on the definition provided by Williams et al (2016), who conducted a survey of 300 micro-enterprises in Lahore. They demonstrated that informality is not a dichotomy, and that the majority of companies are not formally or informally organized, but lie somewhere between the extremes. This can be said to be the true picture if the partially registered firms are included within the informal sector. It also prevents from excluding firms that do not have a tax registration but have a municipal trade license, for instance, (Saif et al., 2023).

However, the empirical research on digital marketing in Pakistan has been limited to only registered SMEs and start-ups. Research into social media and the adoption of digital marketing in Pakistan typically involves sampling from lists of chamber of commerce and SME directories or start-up incubators (Ahmed et al., 2025; Qalati et al., 2022; Ullah et al., 2023). These companies are systematically different from informal micro-enterprises with respect to owner education, managerial specialization, access to finance and exposure to formal support programmes. The frameworks that are based on these firms emphasize organizational resources. The technology-organization-environment (TOE) framework is a clear case, which focuses on top-management support and IT infrastructure. Both are not found in a one-man store. This evidence base might therefore lead to misdiagnosis of the constraints that most Pakistani enterprises encounter, which will result in suboptimal policy.

The purpose of this study is to fill this gap with three research questions. First, how much

do digital literacy, formal education and social networks account for digital marketing adoption in informal micro-enterprises in Pakistan? Secondly, is there a relationship between adoption and perceived marketing effectiveness? Third, do capability and networks affect effectiveness via adoption and does the effect of education operate via digital literacy? There are three matching objectives. The study proposes a measure for the relative importance of personal ability and social connections in the adoption process. It measures the connections between adoption and effectiveness. It also examines the mediating pathways between schooling and usable digital skill.

The study makes three contributions. It is an adaptation of the technology acceptance model to a group of people where organizational factors are not very important and individual capability is vital. It adjusts the resource-based view for companies with a critical resource in the owner's ability and contacts. It also provides evidence to rework the Pakistani digital-skills programmers, which have traditionally been geared towards educated youth and not practicing shopkeepers. The remainder of the paper is a review of the literature and the formulation of hypotheses. It then explains the methodology, reports on the results and discusses their theoretical and policy implications before finishing.

2.0 Literature Review

2.1 Digital Marketing Adoption in Pakistani SMEs

Research on digital marketing in Pakistan has increased rapidly. It focuses, however, on the registered portion of the firm-size distribution. According to Ullah et al. (2023), perceived relative advantage and related technological and environmental factors are the factors that influence the adoption of digital marketing among SMEs in Pakistan. They also discovered that adoption positively contributes to the performance of SMEs. Qalati et al. (2021, 2022) used the TOE framework for the Pakistani SMEs. They found that relative advantage, compatibility, interactivity and customer pressure are predictors of social media adoption, which in turn is a predictor of firm performance. Fan et al. (2021) demonstrated how entrepreneurial orientation affects the adoption and performance of social media. In their study, innovation capability was found to be a moderator between adoption and performance. Nazir et al. (2025) conducted a qualitative study and found skills, cost perceptions and competitive pressure to be recurring themes in Pakistani SMEs' decision to switch from traditional marketing to social media marketing.

The study most similar to the present one is Ahmed et al. (2025) which conducted a survey of 386 small and medium start-ups in Karachi. The factors of technology compatibility, infrastructure and knowledge had a positive effect on social media marketing adoption. The level of complexity and cost were not major obstacles. Technology knowledge also mediated the effects of the other technological factors. This discovery is relevant to the current argument. After the basic infrastructure is established, knowledge becomes the key factor. However, in Karachi start-ups are typically created by graduates, and knowledge and schooling are confounded. It is not tested whether the same mechanism applies to the shopkeepers who have secondary or lower schooling.

The evidence from around the world is similar. Chatterjee and Kar (2020) found that perceived usefulness, ease of use and compatibility have an impact on social media marketing

among SMEs in India while facilitating conditions have no impact. Solomon et al. (2024) investigated the commercial districts firms in Kenya and Nigeria. They discovered that knowledge and learning by doing influence social media adoption and that the smallest companies are the ones who have the most constrained capacity when it comes to social media. Collectively, these works indicate that the binding constraint of small enterprises has shifted from infrastructure to capability. Still, they fail to take the informal micro-enterprise into the picture.

2.2 Informal Micro-Enterprises in Pakistan

Williams and Shahid (2016) conducted a survey of 300 entrepreneurs from Lahore. They concluded that 62% of these were completely informal businesses, 31% were mostly informal and 7% mostly formal. This was expanded upon by Williams et al. (2016). They revealed that the extent of informality of Lahore micro-enterprises is largely explained by the attributes of the entrepreneur and the enterprise. Female entrepreneurs, as well as those who were older, more educated, and higher income, were less informal. Two implications follow. First, the informality is graded, which makes it justifiable to incorporate partially registered firms in the population. Second, it is already known that the level of education has a relationship with the way these firms interact with formal institutions. This also suggests that it is a natural predictor of digital engagement.

However, the latest evidence from Consortium for Development Policy Research (CDPR) indicates that the informal micro enterprises in Lahore have shifted to online platforms, but not in practice. They have an active WhatsApp or social media account but don't use it for marketing (Shakir, 2026). The research on digital finance also indicates a disconnect between availability and fit. Mustafa et al. (2019) discovered that as currently designed, the digital financial services did not well meet the financial needs of women micro-entrepreneurs in Pakistan. In contrast, Suri and Jack (2016) demonstrated in Kenya that mobile money can shift households from farming to entrepreneurship, where it is accessible and widely adopted. This was particularly the case for households headed by women. The lesson for marketing is that access is a prerequisite, but not enough. It is the ability of owners to utilize the tools in a manner that is suitable for their operations that is important.

2.3 Digital Literacy

Digital literacy is the capacity to use digital tools purposefully for operational, informational and communicative skills. Van Deursen and van Dijk (2019) claim that when physical access is no longer a limiting factor, inequalities can shift to the material access, skills and outcomes of use. Thus, the return they can receive may be vastly different for people who have the same device. Van Laar et al. (2020) have conducted a review on the determinants of digital skills of workers. They said that studies have focused on demographic and socioeconomic factors and ignored social determinants, such as social support. Digital literacy manifests itself in tangible marketing actions for the micro-enterprise owner. These include the ability to take good product images, create a WhatsApp Business catalogue, post status updates, and respond to queries as well as accept wallet payments. A smartphone without these skills is nothing but a communication device and not a marketing tool.

2.4 Formal Education

Most commonly, human capital is measured as formal schooling in development studies. It is linked with reduced informality of Lahore micro-enterprises (Williams et al., 2016). Education can help increase adoption through enhancing literacy in Urdu and English, numeracy and confidence with new tools. But schooling and learning digital skills are different. Among secondary school owners, many have acquired digital tools through experience and some graduates seldom use them. If education is only relevant in terms of the acquisition of digital literacy, then its direct impact on adoption should diminish once digital literacy is considered. This is relevant to policy because Pakistani digital-skills programmes are typically based on schooling as a filter criterion.

2.5 Social Networks

According to social network theory, economic behavior is dependent on the social relations in which it is situated (Granovetter, 1985). It also argues that loose connections have new information flows between otherwise unconnected groups (Granovetter, 1973). Nahapiet and Ghoshal (1998) demonstrate how the structural, relational and cognitive aspects of social capital help in the transfer of knowledge. Development economics provides direct evidence of technology diffusion through networks. Conley and Udry (2010) revealed that following the unexpected success of some of their information neighbors, the pineapple farmers in Ghana made changes in their farming practices. Bandiera and Rasul (2006) discovered that in Mozambique, introduction of a new crop was a function of family and friends adopting the crop. In commercial clusters of Pakistan, the owners monitor their counterparts, exchange suppliers and customers contacts, and participate in trader WhatsApp groups. The links can credibly offer a demonstration, informal training and encouragement of the importance of digital marketing.

2.6 Theoretical Integration

Davis' (1989) technology acceptance model (TAM) is an explanation of use in terms of perceived usefulness and perceived ease of use (PEU). The unified theory of acceptance and use of technology (UTAUT) includes social influence and facilitating conditions (Venkatesh et al., 2003). Digital literacy is the ability that affects perceived ease of use in the informal micro-enterprise. A network relationship offers social influence and informal facilitating conditions that formal organizations would offer. The resource-based view (RBV) posits that a sustained competitive advantage can be derived from resources that are valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991). The owner's digital skills and authority in the network are the only ones that can be considered as fixed assets in a micro-enterprise. Adoption is the process through which they become marketing outcomes. These resources are acquired and spread as described by social network theory. Thus, digital literacy, education and networks are considered antecedents of adoption in the integrated model. The process of turning capability into effectiveness is called adoption, in turn.

2.7 Hypotheses

The first hypothesis draws on TAM and UTAUT and on evidence that knowledge is pivotal for small-firm adoption (Ahmed et al., 2025; Solomon et al., 2024).

H1. Digital literacy is positively associated with digital marketing adoption.

The second draws on human capital arguments and on the association between education and formality (Williams et al., 2016).

H2. Formal education is positively associated with digital marketing adoption.

The third draws on social network theory and on evidence of technology diffusion through networks (Bandiera & Rasul, 2006; Conley & Udry, 2010).

H3. Social network ties are positively associated with digital marketing adoption.

The fourth draws on RBV and on evidence that adoption improves small-firm outcomes (Qalati et al., 2021; Ullah et al., 2023).

H4. Digital marketing adoption is positively associated with perceived digital marketing effectiveness.

RBV implies that resources affect outcomes through their deployment. This leads to two mediation hypotheses.

H5a. Digital marketing adoption mediates the relationship between digital literacy and perceived effectiveness.

H5b. Digital marketing adoption mediates the relationship between social network ties and perceived effectiveness.

Finally, schooling may matter chiefly as a route to usable skill.

H6. Digital literacy mediates the relationship between formal education and digital marketing adoption.

3.0 Methodology

3.1 Research Design

The study uses a quantitative, cross-sectional survey design. A survey suits the research questions because they concern the relative strength of several latent antecedents and the mediating pathways among them. Answering them requires standardized measurement across a reasonably large sample. A cross-sectional design is a pragmatic choice for a first systematic test in an under-researched population. It does limit causal inference, as discussed under limitations.

3.2 Population and Sampling

The population consists of informal micro-enterprises in the two largest urban labor markets in Pakistan: Layyah and Kotsultan, which are commercial clusters. An enterprise is eligible if it is (a) privately owned and non-agricultural, (b) employs 10 or less workers (including the owner), (c) is wholly unregistered or registered with either one of the Federal Board of Revenue, the provincial revenue authority or the local government trade-licensing office, and (d) has been in operation for at least 12 months. The following criteria are based on the graduated view of informality outlined by Williams et al. (2016).

There is no sampling frame for this population. Unregistered firms are not listed in tax, chamber and SMEDA lists, and random route household methods are not effective on commercial streets. So, it is not possible to use a probability sampling. Instead, stratified purposive sampling is used in the study. This is a way to maintain the heterogeneity on the dimensions most likely to impact digital marketing, while also being feasible in practice. Strata is divided into city and sector. Layyah and Kotsultan are two cities. The four sectors are general retail and kiryana, garments and

tailoring, food and ready to eat and mobile phone, electronics and repair services. Four commercial clusters were chosen in each city to cover income spectrum. In Layyah these were for example Sadar Bazar, College Road. They were called Saddar Bazaar in Kotsultan. The enumerators visited all eligible shops in each cluster along a pre-determined route. They used the eligibility screen prior to the interview. This spatial stratification is like that employed by Williams et al. (2016) in Layyah and Kotsultan market, which will reduce the chance of clustering on a single type of market.

The aim is to sample 250 to 350 enterprises. Hair et al. (2019) suggests basing PLS-SEM sample sizes on maximum number of arrows pointing at a construct and on desired effect sizes. In this model at most three substantive predictors and four controls point at adoption. Thus, a sample size of more than 250 provides sufficient power to detect small to medium sized effects at the 5% level. Of the 368 eligible firms approached, 327 interviews were conducted. Excluding those with over 10% missing data or no variation in responding, 312 cases remained.

3.3 Instrument and Data Collection

Data is gathered using face-to-face interviews in Urdu with enumerators. Wherever necessary, Punjabi/Sindhi clarification is provided. Interviewer administration overcomes low reading literacy and increases the response rate. It also enables enumerators to confirm the presence of an observable factor, like the presence of a WhatsApp Business catalogue or smartphone ownership. To translate the English questionnaire into Urdu, a bilingual researcher was used and the Urdu translated questionnaire was back translated by another person following Brislin (1970). Any discrepancies were resolved by the research team. The instrument was pilot tested with 30 enterprises outside the main clusters to fine-tune wording, response anchors and length of the interview which turned out to be around 25 minutes. Interviews will take place outside of busy trading times to minimize respondent burden.

3.4 Measures

All items are measured on 5-point Likert-type scales (unless otherwise indicated, 1 = strongly disagree, 5 = strongly agree). Digital literacy (6 items) reflects the operational and communicative competence for marketing-related tasks. These involve taking pictures of products to share, adding a WhatsApp Business catalogue, sending status updates, voice notes and location pins and accepting payments from the wallet. The items are an adaptation of the skill dimensions described by van Deursen and van Dijk (2019) and van Laar et al. (2020) to the micro-enterprise context. Formal education is defined as completed years of schooling (0 to 16 or more) and considered as one observed indicator. Social network ties (5 items) involve the extent to which the owner is aware of other traders in nearby areas who have online stores and participates in trader/supplier WhatsApp groups. They also include questions about learning digital practices from peers or family and about getting assistance when having difficulty with digital tools. Digital marketing adoption (six items, 1 = never to 5 = daily) measures the frequency with which the owner uses WhatsApp or WhatsApp Business to market products, makes posts on Facebook or TikTok and shares catalogues or price lists. It also includes considerations for responding to online enquiries and for paid boosts and promoting digital payment options. The following items are

adapted from Qalati et al., 2022 and Chatterjee and Kar, 2020. Perceived digital marketing effectiveness (five items) includes questions about whether digital marketing has helped attract new customers, as well as more repeat orders and expanded reach beyond the immediate area. It also inquires if they have seen an increase in sales and less dependence on foot traffic. These items are based on the performance measures in Ullah et al. (2023). Enterprise age, number of workers, owner age, owner gender, sector and city are controls.

3.5 Reliability, Validity and Common Method Bias

Indicator loadings (threshold value of 0.70), Cronbach's alpha and composite reliability (0.70-0.95), and average variance extracted (AVE $\geq$ 0.50) are used to assess the measurement model. Heterotrait-monotrait ratio (HTMT < 0.85, Henseler et al., 2015) is used to assess discriminant validity. All constructs are self-reported, and a single interview is used, therefore a number of procedural controls for common method bias are implemented. Predictor and outcome items are distinct, and anchors of scales vary. Anonymity is guaranteed and enumerators are briefed about the importance of not giving leading prompts (Podsakoff et al., 2003). A full collinearity test is performed as a statistical check and all variance inflation factors are expected to be less than 3.3 (Kock, 2015).

3.6 Ethical Considerations

Participation is voluntary. There are some respondents with limited reading literacy. Hence, informed consent is taken orally, after reading a standard statement in Urdu, and consent is noted on the form. There are no record of business names, addresses or tax identifiers. Data are kept on secure (encrypted) devices and are accessible only to the research team. The authors' institutional review board provides ethical approval.

3.7 Analysis Strategy

The analysis is carried out in three stages. Descriptive statistics first describe the sample and their digital practices. The measurement model is evaluated as above. The structural model is presented below, which was estimated using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4. There are four reasons why covariance-based SEM is not preferred to PLS-SEM. The purpose of the study is to account for variance in adoption and effectiveness, and to use the PLS-SEM to extend the current theory to a new population, as PLS-SEM is well suited for this (Hair et al., 2019). The model includes multi-item reflective constructs, and a single-item observed indicator (education), which can be directly handled by PLS-SEM. Data collected from informal firms are usually non-normal and PLS-SEM does not assume any distribution of the data. Lastly, PLS-SEM has been already proven in marketing research using sample sizes like the one used in this study (Sarstedt et al., 2022). Path significance is calculated by 10,000 subsamples of the bootstrap method and bias corrected 95% confidence intervals. Bootstrapped indirect effects are used to test mediation. R^2, f^2 and Q2 are used to report on explanatory and predictive power.

4.0 Findings and Results

4.1 Demographic, Enterprise, and Digital Profile of the Sample (N= 312)

Characteristic	Category	n	%
City	Layyah	168	53.8
	Kotsultan	144	46.2

Sector	General retail and kiryana	107	34.3
	Garments and tailoring	73	23.4
	Food and ready-to-eat	68	21.8
	Mobile phone and electronics services	64	20.5
Owner gender	Male	277	88.8
	Female	35	11.2
Owner age (years)	18–29	82	26.3
	30–39	117	37.5
	40–49	75	24.0
	50 and above	38	12.2
Owner education	Fewer than 10 years	88	28.2
	Matriculation or intermediate (10–12 years)	148	47.4
	Bachelor's degree or higher (14+ years)	76	24.4
Number of workers	1–2	131	42.0
	3–5	139	44.6
	6–10	42	13.5
Enterprise age (years)	1–5	121	38.8
	6–10	104	33.3
	11 and above	87	27.9
Registration status	Wholly unregistered	129	41.3
	Partially registered	183	58.7
Digital profile	Owner owns a smartphone	294	94.2
	Uses WhatsApp for business at least weekly	280	89.7
	Maintains a WhatsApp Business catalogue	114	36.5
	Posts on Facebook or TikTok at least weekly	87	27.9
	Accepts JazzCash or Easypaisa payments	191	61.2
	Has ever paid to boost a post	27	8.7

The demographic, enterprise and digital profile of the sample is summarized in Table 1. The illustrative sample consists of 312 owner-managers, of which 168 (53.8%) were owner-managers in Layyah and 144 (46.2%) in Kotsultan. According to industry, 107 enterprises (34.3%) are involved in general retail, 73 (23.4%) in garments and tailoring, 68 (21.8%) in food and 64 (20.5%) in mobile phone and electronics services. Most owners are men (88.8%). Mean owner age is 36.4 years (SD = 9.8). The average tenure of enterprises is 8.7 years (SD = 6.2) and the average number of workers employed in enterprises is 3.1 (SD = 2.0). Mean schooling is 9.6 years (SD = 3.8). Out of the owners, 28.2% have completed less than 10 years, 47.4% have completed matriculation or intermediate and 24.4% have obtained a bachelor's degree or higher. There are 41.3% enterprises that are unregistered and 58.7% enterprises that are partially registered. Nearly everyone can access it, but so many are not active users. 94.2% of owners have a smartphone, and 89.7% use WhatsApp to communicate with their business at least once a week. However, only 36.5% have a WhatsApp Business catalogue. Only 27.9% post to Facebook or TikTok at least once a week and 8.7% have ever paid to boost a post. JazzCash/Easypaisa payment is accepted by 61.2%. The average adoption score came in at 2.47 out of 5, which aligns with this view of digital presence, albeit with a light marketing application.

4.1 Measurement Model

One adoption item, loaded at 0.58. This is due to the low usage of paid boosts in the sample, and the item was dropped. Other loadings are all between 0.72 and 0.88. Cronbach's alpha values vary from 0.84 (social network ties) to 0.90 (adoption) while composite reliability varies from 0.89 to 0.92. The AVE values for digital literacy, social network ties, adoption and effectiveness are

0.62, 0.61, 0.66 and 0.69 respectively. All exceed 0.50. The square roots of AVE are larger than inter-construct correlations (Table 2). The highest HTMT ratio (adoption/effectiveness) is 0.71, which is below the threshold of 0.85 (Henseler et al., 2015). The full collinearity VIFs are all below the 3.3 cut-off point, ranging from 1.31 to 2.18. Common method bias is thus not likely to be a serious concern (Kock, 2015).

Table 4.2 Means, Standard Deviations, and Correlations Among Study Variables

Variable	M	SD	1	2	3	4	5	6	7
1. Digital literacy	2.84	0.97	(.79)						
2. Formal education (years)	9.60	3.80	.48**	-					
3. Social network ties	3.12	0.88	.31**	.17**	(.78)				
4. Digital marketing adoption	2.47	0.91	.56**	.29**	.47**	(.81)			
5. Digital marketing effectiveness	2.96	0.84	.44**	.21**	.40**	.62**	(.83)		
6. Enterprise age (years)	8.70	6.20	-.08	-.11	.06	-.03	.04	-	
7. Number of workers	3.10	2.00	.12*	.15**	.10	.18**	.21**	.27**	-

Note. N = 312 (illustrative). Values in parentheses on the diagonal are square roots of the average variance extracted. Constructs 1, 3, 4, and 5 are measured on five-point scales. *p < .05. **p < .01.

4.2 Structural Model and Testing of Hypotheses

The model accounts for 41% of the variance in adoption, 41% in effectiveness and 23% in online literacy (Table 3, Figure 1). Q2 values of 0.27 for adoption and 0.26 for effectiveness point to medium predictive relevance. Digital proficiency positively affects adoption (β = .38, p < .001; f^2 = .19), supporting H1. Formal education does not have a significant direct effect on adoption (β = .06, p = .263; f^2 = .01), and therefore H2 is not supported. H3 is supported as social network ties have a positive impact on adoption (β = .31, p < .001; f2 = .15). Adoption has a significant positive effect on perceived effectiveness (β = .49, p < .001; f2 = .31), providing support for H4.

There is a significant indirect effect of technological literacy on effectiveness through adoption (β =.19, 95% CI [.12,.26]). The direct effect is also significant (β = .11) . This suggests partial mediation and supports H5a. Adoption accounts for about 63% of the total effect. The indirect effect of social network ties on adoption is also significant (β = .15, 95% CI [.09, .22]). There is a smaller direct effect (β = .13). This supports H5b. Education has a strong effect on online literacy (β=.48, p<.001). The indirect effect of its effect on adoption through online literacy is significant (β = .18, 95% CI [.12, .25]) The direct path was not significant, indicating that online literacy fully mediates the relationship between education and adoption, supporting H6. Only enterprise size among the controls is significant (β = .09, p =.041).

Table 4.3 Structural Model Results for Direct and Indirect Effects

	Path	β	t	P	95% CI	Decision
H1	Digital literacy → Adoption	.38	6.71	< .001	[.27, .49]	Supported
H2	Formal education → Adoption	.06	1.12	.263	[-.04, .17]	Not supported
H3	Social network ties → Adoption	.31	5.88	< .001	[.21, .41]	Supported
H4	Adoption → Effectiveness	.49	8.94	< .001	[.38, .59]	Supported

-	Formal education → Digital literacy	.48	10.02	< .001	[.38, .57]	
-	Digital literacy → Effectiveness	.11	1.97	.049	[.01, .22]	-
-	Social network ties → Effectiveness	.13	2.36	.018	[.02, .23]	-
H5a	Digital literacy → Adoption → Effectiveness	.19	5.02	< .001	[.12, .26]	Supported (partial)
H5b	Social network ties → Adoption → Effectiveness	.15	4.61	< .001	[.09, .22]	Supported (partial)
H6	Formal education → Digital literacy → Adoption	.18	5.37	< .001	[.12, .25]	Supported (full)
Control	Number of workers → Adoption	.09	2.04	.041	[.01, .18]	-
Control	Enterprise age → Adoption	-.04	0.81	.418	[-.13, .05]	-
Control	Female owner → Adoption	-.05	1.02	.308	[-.14, .05]	-
Control	Kotsultan (vs. Layyah) → Adoption	.05	0.97	.332	[-.05, .15]	-

Note. N = 312 (illustrative). β = standardised path coefficient. Confidence intervals are bias-corrected and based on 10,000 bootstrap subsamples. R^2 = .23 (digital literacy), .41 (adoption), .41 (effectiveness). Sector dummies were included as controls and were non-significant.

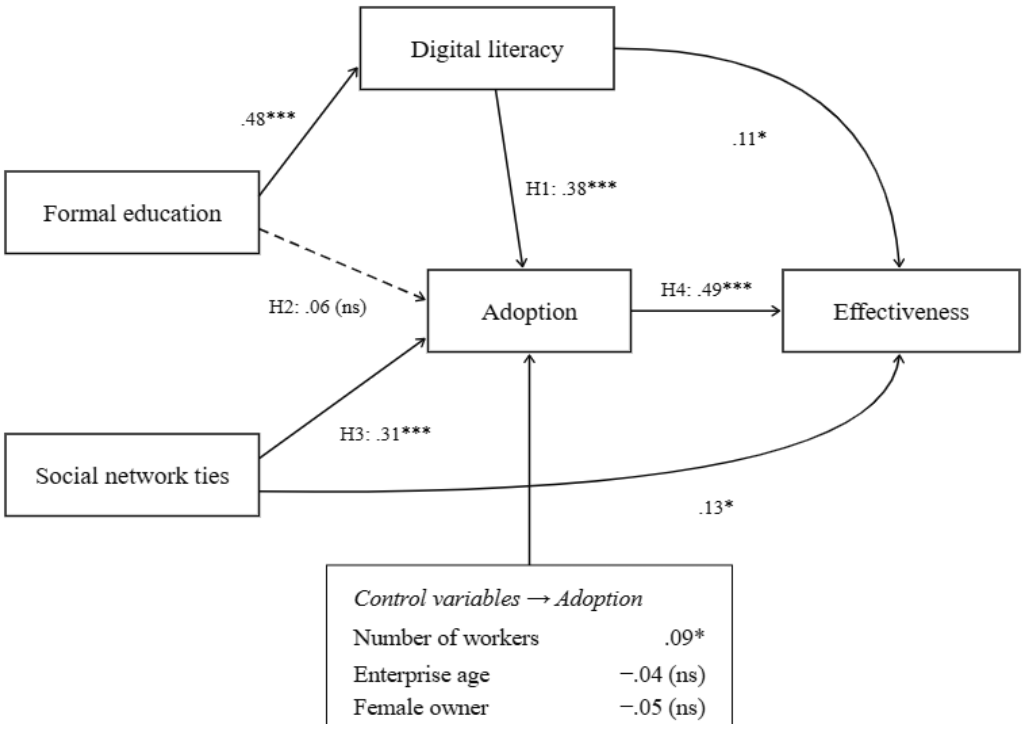


Figure 4.1 Structural Model

5.0 Discussion and Conclusion

5.1 Interpretation of Findings

The illustrative results all paint a consistent picture. Nearly all owners own a smart phone and have WhatsApp. Still less than 20% of them use it as a marketing tool in a structured manner. This difference between access and active use is the empirical heart of the paper. This reflects a

similar passive digital presence observed for the informal businesses in Layyah (Shakir, 2026). Of that gap, digital literacy is the best predictor of adoption. This fits with Ahmed et al. (2025), who found technology knowledge to be the pivotal mediator of social media marketing adoption among Kotsultan start-ups. It also aligns with Solomon et al. (2024) who found knowledge and learning-by-doing to be core in Kenya and Nigeria. The same mechanism extends down to much less resourced firms as per the present model.

Perhaps most policy-relevant of the results is the non-significant direct effect of formal education. Education is important, but only in that the more-educated owners have gained more digital skill. The addition of digital literacy to the model suggests that schooling makes little contribution once digital literacy is included (Ullah et al., 2024). This corroborates the previous study by Williams et al. (2016) which found that educated entrepreneurs are less likely to be informal. In the digital domain it is usable skill rather than the credential that does the work. Owners with eight years or ten years of schooling, who have learnt the skill to make a catalogue and reply to queries seem to be as active as graduates with the same skill.

The second big factor that influences adoption is social network connections. Some owners have friends who are marketing on-line, are part of trader WhatsApp groups and can call upon friends or family to assist. These owners are substantially more likely to adopt. This is in line with the diffusion of networks, as observed by Conley and Udry (2010) and Bandiera and Rasul (2006). Moreover, it can be seen to correspond to Granovetter's (1985) description of economic action as embedded in social relationships. With forested commercial areas, if a neighbor is doing well with a WhatsApp catalogue, that can provide a demonstration of value and an informal training session.

Lastly, there is a strong relationship between adoption and perceived effectiveness which is in alignment with the findings of Qalati et al. (2021) and Ullah et al. (2023). The partial mediation of digital literacy and network effects suggests that these resources are important for outcomes primarily because they result in more active use. There's still some upside to this, though. This could be because owners who are able and well-connected are more effective with the same tools.

5.2 Theoretical Contributions

The study makes three contributions. Firstly, it is an adaptation of TAM and UTAUT to the context of informal micro-enterprises, where their central constructs have been moved. For this population, ease of use is dependent on the owner's digital literacy and not system design. Peer networks are the source of social influence and facilitating conditions and not organizational infrastructure or IT departments (Davis, 1989; Venkatesh et al., 2003). Registered SMEs were used to develop the organizational arrangements like TOE. They need to be complemented by constructs for individual capability and networks when applied to informal firms. Second, the study is an adaptation of RBV to the micro-enterprise. It sees the owner's digital capability and network position as resources of the firm that are difficult for less-connected rivals to copy. It also indicates that adoption is how these resources are turned into outcomes (Barney, 1991). Third, the study distinguishes between schooling and digital literacy. In doing so it addresses the call by van Laar et al. (2020) to shift beyond using demographic predictors of digital skill. It also reinforces

the notion of van Deursen and van Dijk (2019) that after the point of access saturation, it is about skills and outcomes.

5.3 Practical Implications

The findings indicate to practitioners the need for short duration, Urdu medium, telephone-based and task-specific training. This includes mobile network operators, wallet providers, trade associations and NGOs. Modules should emphasize on specific activities, not on digital marketing concepts. This includes taking product images, preparing a WhatsApp Business catalogue, writing urdu price lists, status updates and wallet payments. Owners are not able to leave their shops and therefore delivery should be in the shop or in a short video and voice note lesson. The network findings indicated that training should be done via existing connections. One approach is to find trusted early adopters in each market and work with them to become peer mentors. One way is to spread out useful tips to trader WhatsApp groups. Either might disseminate skills more rapidly than classroom programmes can. JazzCash and EasyPaisa already have a presence in these markets via its agent network. They're natural collaborators when it comes to mixing payment onboarding with marketing fundamentals.

5.4 Policy Implications

The flagship digital-skills programmes in Pakistan were created for another population. In Punjab, for instance, the e-Rozgaar programme by the Punjab Information Technology Board (PITB) requires a minimum educational qualification of 16 years and aims to reach out to the unemployed youth to engage in freelancing (Punjab Information Technology Board [PITB], 2019). Based on the current findings, it can be concluded that such eligibility criteria exclude the very owners that could benefit from digital marketing in terms of income enhancement. Schooling is also an ineffective method of screening for the right kind of ability. A focused ‘shopkeeper track' in e-Rozgaar and in Punjab Skills Development Fund (PSDF) would be more appropriate to fulfill the requirement. It would not have any minimum education requirement, would take place at market and would evaluate what is done, not certificates. SMEDA can incorporate digital marketing support as part of its business development services. It may also widen the reach to the unregistered firms without requiring registration first, as this will probably discourage participation. The State Bank of Pakistan's digital financial inclusion agenda could be tied up with basic marketing guidance to onboard the merchants for wallet acceptance. This would corroborate evidence on the power of usable mobile money to bring people on board as businesses (Suri & Jack, 2016). It should also take into account warnings that poorly fitted services do not work for micro-entrepreneurs (Mustafa et al., 2019). In all of these programmes, budgeting for peer-mentor networks would leverage the results' network channel.

5.5 Limitations and Future Directions

There are several limitations that qualify these conclusions. Firstly, stratified purposive sampling was used as there is no sampling frame. It restricts statistical generalizations to the other than the clusters selected, namely Layyah-Kotsultan. Rural markets and home-based enterprises and smaller cities may act differently. Secondly, the cross-sectional design does not allow causal direction to be determined. Active marketing can create digital skill and extend networks as much

as the other way round. Third, effectiveness is self-reported and optimists or social desirability may inflate results. Common method concerns can be mitigated by procedural remedies, but not eliminated, by applying the full collinearity test. Fourth, the sample is under-representative of women. This reflects their participation in enterprises visible in the commercial clusters, but it excludes home-based female entrepreneurs.

Future research needs to be panel designs or field experiments to determine causal effects. This could be done by randomizing training of peer mentors across markets. Self-report bias would be overcome by objective outcome measures. These might be wallet transaction history, or order logs gathered with consent. Research on informal enterprises including home-based and women-led enterprises would expand the evidence. As would sector-specific studies, for instance, TikTok for food and clothes. Lastly, multi-group analysis might test the hypothesis of a stronger network effect in denser clusters, as social network theory would lead one to expect.

5.6 Conclusion

This study aimed to understand the reasons behind the lack of informal micro-enterprises' use of digital channels as marketing tools, despite the vast majority of them now being connected. The model created here is a combination of TAM and UTAUT, the resource-based view and social network theory on capability and networks. It gives a definite answer. Access is no longer the main barrier. The difference between active digital marketers and passive digital account holders is the owner's usable digital skill. It's also the network connections through which that skill is acquired, modeled and reinforced. The importance of formal education is only as far as it enables owners to develop that skill. Capability and networks translate to marketing benefits through adoption.

Contribution

Fahad Naeem: Problem Identification and Theoretical Framework
Muhammad Saad Hassan: Data Analysis, Supervision and Drafting
Kamran Aslam: Methodology and Revision

Conflict of Interests/Disclosures

The authors declared no potential conflicts of interest in this article's research, authorship,and publication.

References

Ahmed, A., Rashid, S., Mat Saad, N., Rana, M. W., Khoso, I. A., & Ahmed, Z. (2025). The tech advantage: Exploring technological determinants of social media marketing adoption in Pakistani small and medium startups. *Journal of Innovation and Entrepreneurship, 14*(1), Article 23. https://doi.org/10.1186/s13731-025-00470-3

American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.). https://doi.org/10.1037/0000165-000

Bandiera, O., & Rasul, I. (2006). Social networks and technology adoption in northern Mozambique. *The Economic Journal, 116*(514), 869–902. https://doi.org/10.1111/j.1468-0297.2006.01115.x

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*(3), 185–216. https://doi.org/10.1177/135910457000100301

Chatterjee, S., & Kar, A. K. (2020). Why do small and medium enterprises use social media marketing and what is the impact: Empirical insights from India. *International Journal of Information Management, 53*, Article 102103. https://doi.org/10.1016/j.ijinfomgt.2020.102103

Chughtai, M. S., Mushtaque , I., Waqas, H., Raza, H., & Luis Angulo-Cabanillas. (2022). Knowledge hiding behaviors as moderator between machiavellianism, professional envy and research productivity: Empirical evidence from emerging economy. *Knowledge Management & E-Learning: An International Journal*, 510–535. https://doi.org/10.34105/j.kmel.2022.14.026

Conley, T. G., & Udry, C. R. (2010). Learning about a new technology: Pineapple in Ghana. *American Economic Review, 100*(1), 35–69. https://doi.org/10.1257/aer.100.1.35

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Fan, M., Qalati, S. A., Khan, M. A. S., Shah, S. M. M., Ramzan, M., & Khan, R. S. (2021). Effects of entrepreneurial orientation on social media adoption and SME performance: The moderating role of innovation capabilities. *PLOS ONE, 16*(4), Article e0247320. https://doi.org/10.1371/journal.pone.0247320

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology, 91*(3), 481–510. https://doi.org/10.1086/228311

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360–1380. https://doi.org/10.1086/225469

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1–10. https://doi.org/10.4018/ijec.2015100101

Mustafa, M., Mazhar, N., Asghar, A., Usmani, M. Z., Razaq, L., & Anderson, R. (2019). Digital financial needs of micro-entrepreneur women in Pakistan: Is mobile money the answer? In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Paper 260). Association for Computing Machinery. https://doi.org/10.1145/3290605.3300490

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*(2), 242–266. https://doi.org/10.5465/amr.1998.533225

Nazir, M. A., Rizwan, H., & Zhu, X. (2025). A thematic analysis of factors influencing small and medium enterprise adoption of social media marketing: A TOE framework perspective. *Qualitative Market Research, 28*(1), 179–205. https://doi.org/10.1108/QMR-10-2023-0143

Pakistan Bureau of Statistics. (2025). *Labour force survey 2024–25: Annual report*. Government of Pakistan. https://www.pbs.gov.pk/wp-content/uploads/2020/07/LFS-2024-25-Annual-Report.pdf

Pakistan Telecommunication Authority. (2025). *Annual report 2024–25*. https://www.pta.gov.pk

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended

remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Punjab Information Technology Board. (2019, January 3). *PITB invites applications for next e-Rozgaar training program* [Press release]. https://www.pitb.gov.pk/system/files/PITB%20eRozgaar%20fresh%20January%202019.pdf

Qalati, S. A., Ostic, D., Sulaiman, M. A. B. A., Gopang, A. A., & Khan, A. (2022). Social media and SMEs' performance in developing countries: Effects of technological-organizational-environmental factors on the adoption of social media. *SAGE Open, 12*(2). https://doi.org/10.1177/21582440221094594

Qalati, S. A., Yuan, L. W., Khan, M. A. S., & Anwar, F. (2021). A mediated model on the adoption of social media and SMEs' performance in developing countries. *Technology in Society, 64*, Article 101513. https://doi.org/10.1016/j.techsoc.2020.101513

Saif, S., Hashim Zameer, Wang, Y., & Ali, Q. (2023). The effect of retailer CSR and consumer environmental responsibility on green consumption behaviors: mediation of environmental concern and customer trust. *Marketing Intelligence & Planning*. https://doi.org/10.1108/mip-04-2023-0181

Saif, S., Tahir2, U., Anjum, S., & Jabeen, A. (2023). Retail Brand Personality and Brand Relationship Quality as initiators of E-Word of Mouth. *NICE Research Journal*, *16*(3), 57–72. https://doi.org/10.51239/nrjss.v16i3.437

Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology & Marketing, 39*(5), 1035–1064. https://doi.org/10.1002/mar.21640

Shakir, Z. B. (2026). *Present but passive: Digital marketing among informal micro-enterprises in Lahore*. Consortium for Development Policy Research. [Insert URL]

Solomon, H. O., Allen, T., & Wangombe, W. (2024). Analysing the factors that influence social media adoption among SMEs in developing countries. *Journal of International Entrepreneurship, 22*(2), 248–267. https://doi.org/10.1007/s10843-023-00330-9

Suri, T., & Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science, 354*(6317), 1288–1292. https://doi.org/10.1126/science.aah5309

Ullah, I., Khan, M., Rakhmonov, D. A., Bakhritdinovich, K. M., Jacquemod, J., & Bae, J. (2023). Factors affecting digital marketing adoption in Pakistani small and medium enterprises. *Logistics, 7*(3), Article 41. https://doi.org/10.3390/logistics7030041

Ullah, S., Zhu Jianjun, Saif, S., Hayat, K., & Ali, S. (2024). The influence of corporate social responsibility on impulse buying. *Management Decision*. https://doi.org/10.1108/md-07-2023-1238

van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2019). The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media & Society, 21*(2), 354–375. https://doi.org/10.1177/1461444818797082

van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2020). Determinants of 21st-century skills and 21st-century digital skills for workers: A systematic literature review. *SAGE Open, 10*(1). https://doi.org/10.1177/2158244019900176

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Williams, C. C., & Shahid, M. S. (2016). Informal entrepreneurship and institutional theory: Explaining the varying degrees of (in)formalization of entrepreneurs in Pakistan.

Entrepreneurship & Regional Development, 28(1–2), 1–25. https://doi.org/10.1080/08985626.2014.963889

Williams, C. C., Shahid, M. S., & Martínez, A. (2016). Determinants of the level of informality of informal micro-enterprises: Some evidence from the city of Lahore, Pakistan. *World Development, 84*, 312–325. https://doi.org/10.1016/j.worlddev.2015.09.003.