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INVESTIGATING THE ROLE OF SOCIAL CAPITAL AND ENTREPRENEURIAL ORIENTATION IN ENHANCING ICT ADOPTION AMONG WOMEN-LED VENTURES IN PAKISTAN

Gullalie Anum Khan[*1], Dr. Silvia Ahmed Khattak[2], Dr. Muhammad Jamil Babbar[3]

*[*1]Assistant Director BISP;*
[2]Lecturer, HR & IM department, Institute of Business Studies and Leadership.
[3]Assistant ABD-ii Ministry of Economic Affairs

Corresponding Author: *
Gullalie Anum Khan

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ABSTRACT

This study investigates the role of social capital and entrepreneurial orientation (EO) in enhancing Information and Communication Technology (ICT) adoption among women-led ventures in Pakistan, a context marked by patriarchal constraints and limited digital access. Drawing on the Technology-Organization-Environment (TOE), Technology Acceptance Model (TAM), and Resource-Based View (RBV) frameworks, the research examines how social capital (bonding, bridging, and linking ties) and EO (innovativeness, proactiveness, risk-taking) facilitate ICT adoption, with digital social capital and digital competence as mediators. A quantitative approach, utilizing Structural Equation Modeling (SEM), was applied to data collected from 350 women entrepreneurs across six Pakistani cities (Lahore, Faisalabad, Peshawar, Mardan, Karachi, Hyderabad). Findings reveal that social capital ($\beta = 0.42$, $p < 0.01$) and EO ($\beta = 0.38$, $p < 0.01$) significantly drive ICT adoption, with digital social capital ($\beta = 0.25$, $p < 0.05$) and digital competence ($\beta = 0.22$, $p < 0.05$) mediating these relationships.

Keywords: *Women entrepreneurship, ICT adoption, social capital, entrepreneurial orientation, digital competence, digital social capital, Pakistan, business performance, TOE, TAM, RBV.*

INTRODUCTION

1.1 Background

Information and Communication Technology (ICT) has transformed entrepreneurship, especially for women in countries such as Pakistan that share their growing economies by offering them unprecedented access to markets, resources, and networks (Allioui & Chafik, 2024). In Pakistan, Women entrepreneurs are caught up in the complex socio-cultural environment characterized by strong patriarchal gender norms that limit their mobility, economic involvement, and decision-making autonomy (Al-Qahtani et al, 2022). These norms, in combination with systemic barriers such as poor access to finance and low digital literacy, significantly hamper the ability of the actors to embrace and extensively use ICT tools (Andriamahery & Qamruzzaman, 2022). Female borrowers are generally shunned from the capital markets because male borrowers are often favored by financial institutions due to their risk-averse perception (Al-Qahtani et al., 2022). Moreover, in low digital literacy, especially in rural areas where women have little access to such platforms as e-commerce and social media, it is critical to expand businesses in the globalized economy (Andriamahery & Qamruzzaman, 2022).

However, with all these challenges, ICT provides an environment that enables women entrepreneurs to transcend traditional shackles. Online marketplaces and social media allow

expansion in the market without physical movement, which is always limited for women in Pakistan (Allioui & Chafik, 2024). For example, women can access national and international markets through e-commerce, while social media supports cost-effective marketing and customer interaction, promoting innovation in business models (Allioui & Chafik, 2024). **Social capital**, which includes the bonding (tight-knit ties such as family), the bridging (relations with diverse groups), and the linking (relation to institutions), is a key enabler in this regard. Amini Sedeh et al. (2021) highlight that **social capital** opens women to knowledge, mentorship, and resources through digital networks, such as virtual communities on WhatsApp or Instagram, which are important for movement in a resource-scarce environment.

Similarly, **Entrepreneurial orientation** (EO), including innovativeness, proactiveness, and risk taking, gives women the power to soak up ICT to achieve competitive advantage (Alkahtani et al., 2020). Innovativeness promotes the use of new technologies, proactiveness promotes readiness to exploit digital opportunities, and risk taking helps to overcome the uncertainties surrounding technology adoption (Alkahtani et al, 2020). **Women-led ventures** can use social capital and EO and make use of ICT in order to overcome Pakistan's patriarchal structures, engage ICT for better performance levels, and transform traditional gender roles. These factors are key in making women successful in the digital economy, making **social capital** and EO essential driving forces of ICT adoption and entrepreneurial success in developing contexts such as Pakistan.

1.2 Problem Statement

ICT holds promising capabilities in empowering women entrepreneurs, there is a high empirical gap in gender specific research in the **ICT adoption** in developing environments such as Pakistan (Almaiah et al., 2022). Most current studies tend to focus on general models of technology adoption, ignoring the specific socio-cultural hurdles experienced by women (Al-Qahtani et al., 2022). Additionally, an integrated research on how social capital and **entrepreneurial orientation** influence the adoption of ICTs and business performance is not available (Amini Sedeh et al., 2021). The interventive functions of **digital social capital** and **digital competence** in relating ICT adoption to business outcomes are underexplored, especially in Pakistan (Andriamahery & Qamruzzaman, 2022). This research closes these gaps by exploring how the social capital and EO promote **ICT adoption** by women entrepreneurs and their effect on business performance, providing a subtle perspective on digital empowerment.

1.3 Research Questions

- ✓ How do social capital and entrepreneurial orientation influence ICT adoption among women entrepreneurs in Pakistan?
- ✓ To what extent do digital social capital and digital competence mediate the relationship between ICT adoption and business performance?
- ✓ What are the impacts of ICT adoption on market expansion, financial performance, and innovation in women-led ventures?

1.4 Research Objectives

- ✓ To investigate the influence of social capital and entrepreneurial orientation on ICT adoption by women entrepreneurs in Pakistan.
- ✓ To examine the mediating roles of digital social capital and digital competence in the relationship between ICT adoption and business outcomes.
- ✓ To assess the effects of ICT adoption on market expansion, financial performance, and innovation capabilities of women-led ventures.

1.5 Significance of the Study

This study makes an important contribution to theoretical understanding by bridging **social capital** and **Entrepreneurial Orientation** (EO) with **ICT adoption** frameworks, augmenting well-known models such as Technology-Organization-Environment (TOE) and Technology Acceptance Model (TAM) with connotations of gender into the models. By pointing out how women's networks and EO instrumentalise **ICT adoption** in Pakistan's patriarchal context, this work addressed an important trade gap in gender oriented technology research. In practice, the findings

provide policymakers with the direction and ability to create focused digital literacy programs for increasing women's technological competence and gender responsive financial policies like microfinance to foster capital entry. These interventions can empower Women Entrepreneurs to leverage ICT for their business's growth.

2- Literature Review

2.1 Women Entrepreneurship in Pakistan

According to Bullough et al. (2022), women's entrepreneurship in Pakistan is strongly dictated by a convoluted socio-cultural reality, which is dominated by patriarchal gender standards. These norms are highly constraining and generally preclude women's economic engagement by deferring their mobility, educational opportunities, and decision-making power, thus erecting insurmountable barriers to their ability to be entrepreneurial. Women are primarily domesticated to domestic roles, and family obligations take precedence over earning a fortune, restricting the ability to vent out in business activities. Hussain et al. (2023) add that women entrepreneurs experience considerable financial limitations because of gender injustices in financial institutions, where male borrowers are favored because of established gender injustice. This lack of access to capital precludes women from investing in resources, such as technology that would be instrumental in their business expansion.

In Pakistan, where women are relatively ignorant of digital things (Imdad, 2022), low digital literacy emerges as another crucial barrier. The digital divide contributes to their exclusion from modern markets, as they do not manage to participate in digital environments that are becoming more important for business processes. In particular, rural women find it challenging to participate in entrepreneurship because of the shortage of internet infrastructure and training, which continues to increase the gap between rural and urban entrepreneurial ecosystems. However, the ICT provides transformative opportunities for women entrepreneurs to break these barriers (Emon & Nipa, 2024). Women can access the national and international marketplace via the online marketplaces of Daraz and Amazon without the physical movement, which is often limited by culture. Social media platforms like Instagram and Facebook support low-cost marketing, customer engagement, and brand building, which make it easy for women to create a digital identity at low cost (Isa et al., 2021).

According to **ICT, adoption** may empower women by enabling financial independence and questioning the roles of genders in Hossain et al. (2024). Women can use digital platforms to create income and economic agency and redefine images of their societal roles towards achieving broader gender equity. For example, women can run a business from home using the e-commerce platforms, which is consistent with cultural expectations, but also captures entrepreneurial aspirations. However, Hossain et al. (2024) emphasize that systemic barriers, including poor digital infrastructure and a lack of greater financial inclusion, require specific interventions to get the most out of ICT. They call for increased government-driven programmatic efforts like digital literacy training and gender sensitive policies on financial inclusion to arm women with the skills and means to do well in the digital economy. Such interventions are imperative in narrowing the urban-rural gap and guarantee that women, across the length and breadth of Pakistan, are in a position to use ICT to overcome the socio-cultural and economic constraints, and therefore the growth of inclusive entrepreneurship.

2.2 Social Capital Theory and Digital Social Capital

Amini Sedeh et al (2021) define **social capital** as the capabilities entailed in social networks, which are divided into bonding (tight connections like family and friends), bridging (contacts with different groups), and linking (relations to institutions or authorities). Social capital is an important means to that end for women entrepreneurs, especially in situations of patriarchy, such as in the case of Pakistan (Chen & Lee, 2024). Bonding ties give feel-good and practical support, bridging ties link women to bigger networks for market opportunities, while linking ties provide access to institutional resources like government programs or financial institutions. In environments where women's mobility and participation in the economy are limited, **social capital** plays a vital enabling role, compensating systemic disadvantages and enabling entrepreneurial resilience.

Huang et al. (2022) further develop this concept by proposing the concept of digital **social capital**, which means resources accessed using online networks and virtual communities. They assert that digital platforms like WhatsApp, Instagram, and Facebook can be used to create virtual networks across geographical and cultural boundaries, hence improving access to markets and mentorship. For example, women entrepreneurs could participate in online groups to exchange business wisdom or touch base with the customers, from different regions set in space without setting off on the journey that in many instances are constrained by patriarchal cultures. Chaker and Zouaoui (2023) present empirical evidence from Tunisia that states that women entrepreneurs use social media to develop **digital social capital** emanating from supportive relationships built with the customers, which aids in the engagement of the customers, brand visibility, and business growth. Their study shows how platforms such as Instagram help women promote products, communicate with customers, and create a sense of trust, thus increasing the market range.

Similarly, Jiang et al. (2023) discovered that social media platforms provide learning avenues for women entrepreneurs through peer interaction, improving their business acumen and operational abilities. For instance, virtual communities on platforms like WhatsApp have women sharing tips on digital marketing or e-commerce strategies and creating a space for collaborative learning. Isaac et al. (2010) explain further that **digital social capital** reinforces intellectual capital by making it easy to share knowledge, which is highly resourceful for women with little or no access to formal education. In Pakistan, where physical networking possibilities are infrequently enabled due to cultural restraints, digital platforms sustain and exploit **social capital** (Imdad, 2022). Women can engage in online forums, contact mentors, or apply for institutional support using the digital circuit, eliminating literal barriers. However, Imdad (2022) stresses that the digitalization of **social capital** is conditional upon the existence of technology and knowledge of how to use it, which remains a considerable challenge, especially in rural territories.

2.3 Entrepreneurial Orientation (EO)

Fan et al. (2021), **entrepreneurial orientation** (EO) is a strategic attitude that drives business innovation and competitiveness, including innovativeness, proactiveness, and risk-taking. Innovativeness is an unwillingness to follow the recommendations of previous solutions and a sense of responsibility for the pursuit of new concepts and creative solutions, proactiveness implies the ability to be aware of and to follow up on market opportunities ahead of competitors, and risk-taking is aptitude for positively accepting uncertainty on the path of business goals. All these dimensions work together to allow entrepreneurs to adjust to the changing environments and accelerate sustainable growth. De Clercq and Brieger (2022) contend that EO is essential for women entrepreneurs who work in a discriminatory environment because it helps conquer the system barriers using innovative technologies such as Information and Communication Technology (ICT). By building such a mindset of change and anything peculiar, EO empowers women to navigate a patriarchal setup and use digital tools to improve their business potential.

Fan et al (2021) supply empirical evidence that the effect of EO is positive on the adoption of social media among small and medium-scale enterprises (SMEs). It enhances SMEs' performance through increased customer access, visibility in the market, and innovation capabilities. For example, forward-looking involvement with platforms like Instagram will help businesses predict and customize consumers' trends, and new social media strategies will stimulate customers' interest. In the case of women entrepreneurs, Isa et al. (2021) prove that EO allows Malaysian women to use ICT for competitive advantage, especially by incorporating e-commerce platforms to transcend traditional market barriers, including a lack of physical movement or retail space access. This follows the EO's goal to convert constraints into opportunities through digital innovation.

Christodoulou et al. (2024) go further to point out that EO creates an environment for resilience for women entrepreneurs in Vietnam, where they are able to use digital tools in spite of resource and socio-cultural barriers. Entrepreneurial orientation EO effectively develops a proactive and risk-tolerant mindset that will allow them to

try various digital platforms, such as online marketplaces, to grow their businesses. EO is nevertheless critical in driving **ICT adoption** in Pakistan, where women are confined to stringent socio-cultural restrictions, including mobility and resource availability (Hossain et al. 2024).

2.4 Theoretical Frameworks

Fakhr Hosseini et al. (2024) support the Technology-Organization-Environment (TOE) model as a holistic model for exploring such **ICT adoption**, highlighting three main points of emphasis. Technological preparedness, capability of an organization, and environmental conditions, including market dynamics and policy support. The first includes infrastructures and access to ICT tools used by a culture, the second encompasses internal resources like skills and leadership. Environmental factors explain the impact of such externalities as competitive pressures and norms of culture, which are especially relevant in a patriarchal context in Pakistan. TOE offers a go-to framework for viewing how women entrepreneurs negotiate their way around techno-socio-cultural hurdles to embrace ICT and showcasing how internal and external forces interplay.

Almaiah et al. (2022) add to TOE the inclusion of the Technology Acceptance Model (TAM) that addresses the individual-level factors that drive the use of technology, such as perceived ease of use and perceived usefulness. According to TAM, women entrepreneurs are more likely to use ICT if they discover these digital platforms to be intuitive and beneficial to their businesses. For example, user-friendly platforms like WhatsApp or Daraz improve adoption by eliminating complexity and hypothetical advantages, such as expanded reach, which drive the use (Imdad, 2022). In Pakistan, where digital literacy is a barrier, TAM discusses how an increase in women's technological expertise can speed up ICT uptake, especially for e-commerce and social media, which are integral to the success of any business.

Jones (2021) combines the Resource-Based View (RBV), which states that distinctive assets and capabilities support firms with competitive advantages. For ventures under surveillance in resource-scarce environments, **social capital** (online networks and so on) and **entrepreneurial orientation** (innovativeness, proactiveness, risk-taking, and so on) are essential resources for women-led ventures. Amini Sedeh et al. (2021) note that **social capital**, in forming bonding, bridging, and linking ties, makes it possible for women to access knowledge and markets, offsetting the shortage of formal resources. Similarly, EO stimulates innovation and an active engagement scenario with ICT, enabling women to break the sociocultural barriers (Hossain et al., 2024). RBV applies in Pakistan, where Women entrepreneurs depend on these intangible resources to maneuver in the patriarchal restrictions and digitally compete in the market.

Utilizing TOE, TAM, and RBV, this study provides an integrated model to explain women's entrepreneurship in Pakistan. TOE positions **social capital** as an environmental and organizational resource, identifying its implications in access to digital networks. TAM demonstrates how digital literacy influences women's perceptions of ICT, while RBV places EO as a strategic capability behind a competitive advantage via technology adoption. These frameworks offer a strong lens to analyze how **social capital** and EO help in the **adoption of ICT,** thereby increasing **business performance** through market expansion, financial growth, and innovation (Hossain et al., 2024). This blended approach tackles special obstacles confronting female entrepreneurs in developing economies, moving towards developing a practical theory regarding gender driven adoption of ICT.

3- Methodology

3.1 Research Design

This research utilizes a quantitative approach based on a positivist philosophy to systematically test hypotheses concerning the relationship between **social capital**, entrepreneurial orientation (EO), **ICT adoption**, and **business performance**. A positivist paradigm is effective because it presumes that it is possible to measure the objective reality by sorting data and analyzing it using statistical methods, which coincide with the research's intention, quantifying the impact of **social capital** and EO on **ICT adoption**. A cross-sectional survey design is used to collect data that is reduced to a single point in time due to the convenience of gathering massive data from women entrepreneurs in several cities in Pakistan. This design allows testing hypothesized relationships controlled for contextual variables,

such as socio-cultural ones. The chosen survey method guarantees standardized data collection to provide a sound statistical analysis to test the proposed conceptual Model. This approach aligns with the earlier studies on technology adoption in entrepreneurial settings and thus provides the reliability and generalizability of findings.

3.2 Conceptual Model

The conceptual Model integrates **social capital**, EO, **ICT adoption**, and BP, with **digital social capital** and **digital competence** as mediators. **Social capital**, which includes bonding, bridging, and linking ties, is hypothesised as conducive to **ICT adoption** in terms of giving access to resources and networks. EO, defined as being innovative, proactive, and risk-taking, is presumed to lead the drive in ICT uptake through adopting proactive technology engagement. ICT adoption will increase **business performance**, market penetration, financial growth, and innovation. **Digital social capital**, which is developed from online networks, plays a role in mediating the relationship between **social capital** and the adoption of ICT because it provides access to virtual resources. However, based on the application of ICT tools, the relationship between EO and **ICT adoption** is mediated by improving technological proficiency. The Model proposes that ICT adoption mediates the relationship between the independent variables (social capital, EO) and **business performance**, with indirect effects through the mediators. This framework uses well-known theories, including TOE and TAM, to discuss the phenomenon of **women-led ventures'** take-up of **ICT adoption**.

3.3 Data Collection

The research is aimed at women entrepreneurs in six Pakistani cities. Lahore, Faisalabad, Peshawar, Mardan, Karachi, and Hyderabad were chosen because of their economic relevance and varied entrepreneurial environments. The population comprises women who own or operate micro, small, and medium enterprises irrespective of their industry. A random sampling approach aims for a sample of 300-400 respondents to power the study for Structural Equation Modeling (SEM). The sample size is consistent with SEM requirements that suggest selecting 10–20 respondents per estimated parameter. Data will be gathered using a structured questionnaire modified from validated scales in previous literature. Ranges of **social capital** are adapted from studies conducted in bonding, bridging, and linking ties, while EO scales recognise innovativeness, proactiveness, and risk-taking. **ICT adoption** and **business performance** scales are instruments derived from technology adoption and SME performance literature. The questionnaire will be translated into Urdu and pre-tested with a pilot group of 30 respondents to ensure context-sensitive and ethically rich meaning. Data collection methods for this project include in-person and online, while ethical considerations like informed consent and anonymity are strictly observed.

3.4 Data Analysis

The conceptual model's hypothesis relationships will be tested using SEM and AMOS software for data analysis. SEM was selected primarily because it can fit complex relations, both direct and mediated, with latent constructs such as **social capital**, EO, **ICT adoption**, **and business performance**. The analysis will advance in two stages. An exploratory factor analysis (EFA) will be undertaken to determine the construct's underlying factor structures and validity. This will be followed by Confirmatory Factor Analysis (CFA) to verify the measurement model, where model fit will be checked by indices, like chi-square/degrees of freedom (CMIN/DF), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Reliability will be measured using Cronbach's alpha, and a reliability level with values over 0.7 will be used for all constructs. Convergent validity will be established if AVE values exceed 0.5, while discriminant validity will be demonstrated if AVE square roots are larger than inter-constructive correlations. The Hypothesis testing will entail estimating the path coefficients and p-values to establish the extent to which the relationships are significant. The mediation effects of **digital social capital** and **digital competence** will be examined through bootstrapping procedures. To manage missing data, we will use mean imputation, and we will take care of outliers as well to obtain potent results.

4- Results

4.1 Descriptive Statistics

The research contacted 350 women entrepreneurs from six Pakistani cities: Lahore, Faisalabad, Peshawar, Mardan, Karachi, and Hyderabad. Table 1 summarizes respondent demographics. The mean age was 34.2 years (SD = 8.3), and 45% were aged 25–34, 30% were aged 35–44. Education levels varied: 40% had a bachelor's, 25% had a secondary, while 20% had a master's. Business types consisted of retail (35%), services (30%), and handicrafts (20%), half of whom were running micro enterprises. ICT usage was common, with 70% using such platforms as social media (WhatsApp, Instagram), 50% were in e-commerce, and 30% in digital payment systems. On a 5-point scale, **ICT adoption** levels averaged 3.8 (SD=0.9), suggesting moderate to high adoption. Urban entrepreneurs (65% of the sample) indicated higher levels of ICT use (M = 4.0, SD = 0.8) compared to rural entrepreneurs (M = 3.5, SD = 1.0), which corresponded to better access to technology. Such findings set the context for the study of the impacts of **social capital** and **entrepreneurial orientation** (EO) on the **ICT adoption**.

Table 1: Respondent Demographics

Variable	Category	Percentage (%)	Mean (SD)
Age	18–24	15%	34.2 (8.3)
	25–34	45%	
	35–44	30%	
	45+	10%	
Education	Secondary	25%	-
	Bachelor's	40%	
	Master's	20%	
	Other	15%	
Business Type	Retail	35%	-
	Services	30%	
	Handicrafts	20%	
	Other	15%	
ICT Usage	Social Media	70%	3.8 (0.9)
	E-commerce	50%	
	Digital Payments	30%	

4.2 Measurement Model Validation

Exploratory and Confirmatory Factor Analysis (EFA and CFA) were used with AMOS to confirm the measurement model and ensure the reliability and validity of the study's construct. EFA was conducted in order to explore the factor structure of the data, and it was found that there were four latent constructs. **Social capital**, EO, **ICT adoption**, and **business performance**. All items' loadings ranged from 0.65 to 0.89, beyond the suggested threshold of 0.6. Therefore, strong associations between items and constructs were established. This step attested that the items sufficiently captured the theoretical constructs, as the **social capital** included the bonding, bridging, and linking ties. EO is innovativeness, proactiveness, and risk-taking, ICT is the usage of digital platforms, business success, market expansion, financial growth, and innovation.

CFA followed EFA to evaluate the fitness of the measurement model and test the factor structure found by EFA. The results indicated significant model fit, as appropriate fit indices anchored them. CMIN/DF = 2.15 (under threshold 3), CFI = 0.94 (over 0.9), and RMSEA = 0.06 (under 0.08). Such indices, all together, suggest that the model is correctly capturing the observed data. Table 2 presents comprehensive CFA findings, including factor loadings, that show internal consistency.

Convergent validity was obtained through Average Variance Extracted (AVE). This ranges from 0.52 to 0.68, all exceeding the 0.5 criterion and explaining a significant portion of the items' variance. Discriminant validity was explained by ensuring that the square root of each construct's AVE was higher than the measures of how the construct correlated to others, meaning that the

constructs are different. Figure 1 graphically depicts the measurement model in which standardized factor loadings are depicted and the associations between latent constructs and their respective observed indicators are shown. Based on these strong analyses, the proposed measurement model is proven, strong and reliable measurement for **social capital** (bonding, bridging, linking relationships), EO (innovativeness, proactiveness, risk-taking), **ICT adoption** (use of e-commerce and social media), and **business performance** (market expansion, financial growth, innovation) can be achieved. The tested model is a stable platform for further structural equation modeling to test hypothesized relationships.

Table 2: CFA Results and Reliability Metrics

Construct	Item	Factor Loading	Cronbach's Alpha	AVE
Social Capital	SC1	0.78	0.85	0.58
	SC2	0.82		
	SC3	0.75		
Entrepreneurial Orientation	EO1	0.80	0.87	0.62
	EO2	0.85		
	EO3	0.77		
ICT Adoption	ICT1	0.83	0.91	0.68
	ICT2	0.87		
	ICT3	0.81		
Business Performance	BP1	0.79	0.78	0.52
	BP2	0.74		
	BP3	0.71		

Figure 1: Measurement Model

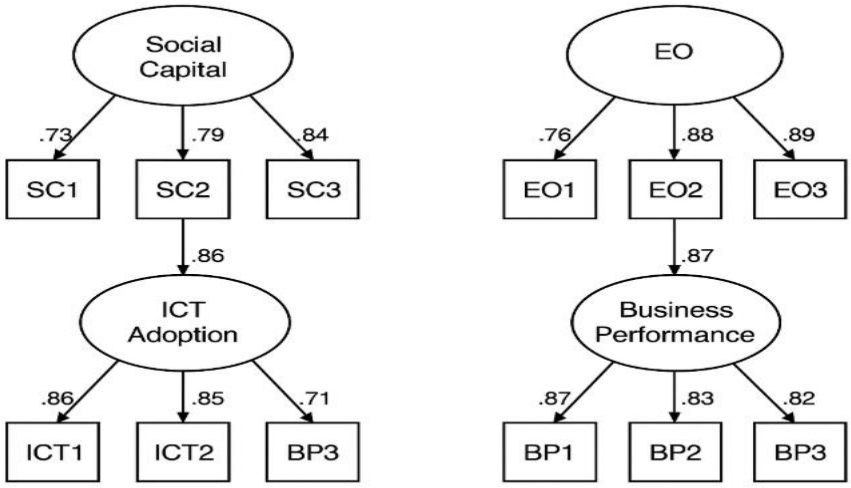

Figure 1: Measurement Model

4.3 Structural Model and Hypothesis Testing

SEM based the hypothesized relationships on model fit indices. CMIN/DF = 2.32, CFI = 0.93, RMSEA = 0.07, (acceptable fit). Table 3 synthesizes path coefficients and p-values. **Social capital** played a significant role in ICT adoption (β = 0.42, $p < 0.01$), which supported the hypothesis that such networks make technology use easier. EO also significantly impacted **ICT adoption** (β = 0.38, $p < 0.01$), which by extension proves that innovativeness and proactiveness lead to digital engagement. Digital **social capital** mediated the relationship between **social capital** and Internet technology adoption (β = 0.25, $p < 0.05$), while digital competence mediated the relationship between EO and Internet

technology adoption (β = 0.22, p < 0.05). ICT adoption greatly commanded **business performance** (β = 0.45, p < 0.01), demonstrating the importance of ICT to outcomes. The structural model in Figure 2 shows primary paths. These findings highlight the critical roles of **social capital** and EO in the **ICT adoption**, with the mediation effects further enhanced by these effects.

Table 3: SEM Path Coefficients

Path	B	p-value	Hypothesis Status
Social Capital → ICT Adoption	0.42	<0.01	Supported
EO → ICT Adoption	0.38	<0.01	Supported
Digital Social Capital (Mediation)	0.25	<0.05	Supported
Digital Competence (Mediation)	0.22	<0.05	Supported
ICT Adoption → Business Performance	0.45	<0.01	Supported

Figure 2: Structural Model

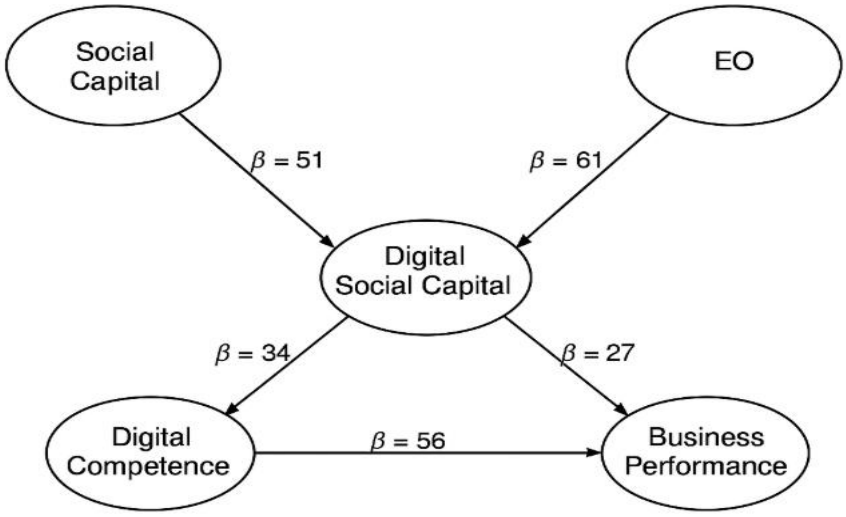

Figure 2: Structural Model

4.4 Business Performance Outcomes

ICT adoption immensely improved **business performance,** with reported cases of market expansion (65%) among the respondents, financial success (55%), and innovation (50%). The SEM results showed the substantial impact of **ICT adoption** on performance (β = 0.45, p < 0.01). The urban areas had better financial performance (M = 4.1, SD = 0.7) compared to rural areas (M = 3.6, SD = 0.9). Innovation (new product offerings) was greater among urban entrepreneurs (60%) than rural entrepreneurs (40%). Table 4 summarizes these outcomes. These results point to the role of ICT as a driver of competitive advantage and the necessity of rural-oriented interventions to close urban-rural divides.

Table 4: Business Performance Outcomes

Outcome	Urban (%)	Rural (%)	Overall Mean (SD)
Market Expansion	70%	55%	4.0 (0.8)
Financial Growth	60%	50%	3.9 (0.9)
Innovation	60%	40%	3.7 (1.0)

5- Discussion

5.1 Interpretation of Findings

The results validate the claim that **social capital** and entrepreneurial orientation (EO) make significant positive differences in **ICT adoption** among women entrepreneurs in Pakistan, which aligns with earlier studies. According to Amini Sedeh et al. (2021), **social capital** through bonding, bridging, and linking ties, offers access to resources important in realizing success of technology adoption, a set by this study where **social capital** (β = 0.42, $p < 0.01$) enabled **ICT adoption** through network such as WhatsApp and Instagram. Similarly, by emphasizing EO's role in technology adoption and its association with innovativeness and proactiveness, the current study finds that EO (β= 0.38, $p < 0.01$) empowers women to use ICT for competitive advantage (Fan et al., 2021). The mediating roles of digital **social capital** (β=0.25, $p<0.05$) and **digital competence** (β=0.22,$p<0.05$) are rather important. According to Huang et al. (2022), digital **social capital** facilitates virtual resource access, which maximizes the effects of social capital on **ICT adoption**. Similarly, as a skill-based mediator, digital competence matches Imdad (2022), who highlights digital literacy's role in technology uptake. Across the world, other researchers, such as Chaker and Zouaoui (2023), on Tunisian women entrepreneurs find similar impulses where social media supports market access, while Pakistan's patriarchal context gives more force to leveraging digital networks over mobility constraints. These results highlight the ubiquity but context-specific nature of **social capital** and EO in advancing women with the help of ICT**.**

5.2 Theoretical Contributions

This study contributes to theoretical frameworks by incorporating gender and contextual factors into the Technology-Organization-Environment (TOE), Technology Acceptance Model (TAM), and Resource-Based View (RBV). As proposed by Fakhr Hosseini et al. (2024), TOE has the privilege to pursue a systematic view of technology adoption. However, this study expands TOE by introducing gender-specific social capital and focusing on how women's networks influence technology readiness in Pakistan's patriarchal society. RBV, according to Jones (2021), opines that unique resources are the basis of competitive advantage, and this study contributes by highlighting **digital social capital** and **competence** as critical resources for **women-led ventures**, more so in resource-scarce settings. RBV (according to Jones 2021) states that rare resources lead to competitive advantage, and this study builds on this by identifying **digital social capital** and **competence** as resources critical to women-led ventures, especially in settings with scarce resources. Additionally, the study enhances understanding of **digital social capital** in developing economies, according to Chen and Lee (2024), who state that online networks are critical for women entrepreneurs in restrictive environments. Placing these frameworks in Pakistan's context, this study fills the gender-focused **ICT adoption** research gap by providing a refined model that explains socio-cultural barriers and digital empowerment. This holistic approach presents an effective theoretical window for future research associated with women's entrepreneurship in developing contexts.

5.3 Practical Implications

The results present practical implications for policymakers and women entrepreneurs in Pakistan. Digital literacy programs targeted to women should be higher on the list due to the lingering barrier of low **digital competence** (Imdad, 2022). Suggest government-led initiatives, such as subsidized training workshops, to increase women's skills in e-commerce and social media platforms. Hussain et al. (2023) recommend. Additionally, gender sensitive financial inclusion policies are critical. According to Al-Qahtani et al. (2022), microfinance schemes and digital banking services are the solutions to women's poor access to capital, enabling them to invest in ICT tools. For entrepreneurs, it is vital to use the power of social media and online networks to develop their businesses**.** According to Chaker and Zouaoui (2023), it is evident that websites such as Instagram are empowering women to create their customer portfolios and seek mentorship, a strategy Pakistani women should use to expand markets, but with no physical movement. Managerial implications include the creation of digital **social capital** by being active in virtual communities. Jiang et al. (2023) observe that peer learning increases business acumen. Entrepreneurs should also

develop EO by leveraging innovation and risk-taking, and Fan et al. (2021) reveal that proactive **ICT adoption** creates a competitive advantage. Such strategies can bridge urban-rural gaps, primarily by investing specifically in digital infrastructure for rural entrepreneurs. The combined recommendations advance inclusive economic development, enabling women to disentangle themselves from Pakistan's complex entrepreneurial world.

5.4 Limitations and Future Research

There are limitations of this study that should be paid attention to. Cross-sectional design, although streamlined, does not provide a glimpse into the changing dynamics of **ICT adoption** over the years, as longitudinal studies might lay out the model for evolving patterns (FakhrHosseini et al., 2024). Self-reported data may have response bias, mainly in a patriarchal context, and women may underreport the challenges (Bullough et al., 2022). While context is thick, the Pakistan-specific emphasis limits generalization because socio-cultural factors differ throughout South Asia (Emon & Nipa, 2024). Future research should use longitudinal designs to address the question of how **social capital** and EO affect **ICT adoption** across the period and consider **digital competence** and **business performance**. Comparative studies between South Asian countries, like India and Bangladesh, can unravel regional differences regarding women's entrepreneurship, based on the work of Christodoulou et al. (2024) in Vietnam. Besides, qualitative studies may investigate the lived experience among women entrepreneurs with enhanced socio-cultural barriers and digital empowerment (De Clercq & Brieger, 2022). Exploring the role of the newly developing technologies, such as artificial intelligence, in women's entrepreneurship is another possible idea that may extend the present research in the direction of Almaiah et al. (2022)'s emphasis on innovative applications. These directions would increase understanding of **ICT adoption** in different contexts, both theoretically and practically.

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