The Factors Affecting The Adoption Taobao E-Commerce on Rural Product: A Case Study of Zhejiang, China

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Abstract

Launched in 2003 by Alibaba Group, Taobao emerged as a dominant player in the Chinese e-commerce landscape. Initially established as a consumer-to-consumer (C2C) marketplace to rival eBay's presence in China, Taobao differentiated itself by catering specifically to the Chinese market with localized features and services. The platform facilitated a diverse range of transactions, including C2C, business-to-consumer (B2C), and consumer-to-business (C2B) interactions. Taobao offered a comprehensive suite of services, including detailed product listings, communication tools, a secure payment system (Alipay), integrated logistics networks, and marketing tools for sellers. Its impact on the Chinese economy was substantial, empowering small businesses, increasing consumer choice, stimulating economic growth (Zhao, 2014), and enhancing consumer convenience. The research aimed to identify and analyze the key factors that contributed to the successful development or adoption of rural e-commerce. The sample consisted of online vendors at Taobao Villages in the coastal province of Zhejiang. The sample size was calculated using W.G. Cochran's formula (for unknown population size) with 95% confidence and 5% tolerance, resulting in a sample of 384 people. The research utilized a quantitative research method approach, including a questionnaire with a reliability greater than 0.7. The statistical analysis included KMO and Bartlett tests, averages, percentages, means, standard deviations, and a structural equation model. The research findings revealed that the key factors that contributed to the successful development or adoption of rural e-commerce were relative advantage (β=0.398), compatibility (β=0.215), technological readiness (β=0.348), perceived complexity (β=-0.382), organizational readiness (β=0.286), organizational size (β=0.203), organizational capacity (β=0.410), monetary resources (β=0.312), competitive pressure (β=0.223), regulatory support (β=0.287), and market pressure (β=0.389).

Keywords: E-commerce, Toabao E-Commerce, Factors Affecting, Rural E-commerce.

Introduction

The rapid development of e-commerce in China over the past 20 years has emphasized the disparity in its adoption between urban and rural areas (Li, 2017). Although e-commerce flourished in urban regions, many rural areas in China still lacked the necessary infrastructure, such as internet services and technological support, to fully benefit from it. This digital divide was significant because it reflected broader economic disparities between urban and rural areas, which had persisted despite efforts to address income inequality since the 1978 economic reforms. The concept of "Taobao Villages," named after Alibaba's e-commerce platform Taobao.com, exemplified the potential of e-commerce to drive economic growth in rural China (Zhu et al., 2020). These villages, particularly along China's eastern coast, developed trading networks that allowed them to participate in global markets. The success of Taobao Villages highlighted how e-commerce could contribute to alleviating poverty and enhancing economic development in rural areas. However, the implementation of e-commerce in rural China was not uniformly successful (Wenxiao, 2021). Various barriers hindered its adoption, including the lack of internet services, inadequate technological infrastructure, low levels of digital literacy, concerns about trust and security, financial challenges, and other environmental factors. These obstacles suggested that simply pushing for e-commerce expansion in rural areas was not enough; a deeper understanding of the specific challenges faced by rural communities was essential to ensure the success of such initiatives.

The research problem was significant because it explored the potential of rural e-commerce to enhance economic growth in rural regions, increase income per capita, and reduce the dependency of rural citizens on agriculture. Understanding the factors that determined the success of rural e-commerce initiatives could help mitigate the persistent urban-rural divide and contribute to the overall economic development of China. Additionally, this research could inform the development of policies by large organizations and the Chinese government to address the barriers that had hindered the adoption of e-commerce in rural areas (Kshetri, 2018). By focusing on the context of Taobao Villages in China, the study aimed to provide unique insights into rural e-commerce within the Chinese context. These insights could also be relevant to other developing nations facing similar challenges in adopting e-commerce in rural areas.

Objective

To identify and analyze the key factors that contribute towards the successful development or adoption of rural e-commerce.

Literature Review

The literature review is conducted to first understand the very context of rural e-commerce in China, the technological adoption models considered after which TOE model was chosen, and then the prior research on TOE model in the context of adoption of e-commerce.

Taobao E-Commerce Platform: A History, Services, and Benefits

Taobao, which translates to "searching for treasure" (Tsui, 2019), was launched in May 2003 by Alibaba Group (Ward, 2015). It was established as a consumer-to-consumer (C2C) marketplace in response to the growing popularity of eBay in China (Zhao, 2014). Alibaba recognized the need for a localized platform that catered specifically to the Chinese market,

offering features and services tailored to local preferences and needs. Taobao provides a diverse range of services, primarily facilitating C2C transactions, but also supporting business-to-consumer (B2C) and even consumer-to-business (C2B) interactions (Lee, 2018). The platform allows individuals and businesses to open online stores and sell a wide variety of products, including clothing, electronics, home goods, and even virtual goods. Taobao offers various features to enhance the shopping experience, such as: Product Listings: Detailed product descriptions, images, and customer reviews. Communication Tools: Built-in instant messaging for buyer-seller interaction. Payment System: Alipay, a secure online payment platform integrated within Taobao. Logistics Network: Integration with various logistics providers for efficient delivery. Marketing Tools: Promotional features and advertising options for sellers.

Taobao has had a profound impact on the Chinese economy and society. It has: Empowered Small Businesses: Provided a platform for small businesses and entrepreneurs to reach a vast customer base (Tsui, 2019). Increased Consumer Choice: Offered consumers access to a wider range of products at competitive prices (Ward, 2015). Stimulated Economic Growth: Contributed to the growth of e-commerce and the overall Chinese economy (Zhao, 2014). Enhanced Convenience: Made shopping more convenient and accessible for consumers across China (Lee, 2018).

Rural E-commerce

E-commerce is defined as "the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals" (Gupta, 2014). Generally, E-commerce practiced in rural regions can be defined as "rural-e-commerce" (Chatterjee, 2019). As rural e-commerce could either mean e-commerce where the rural producers and traders sell their rural products beyond rural boundaries or the use of e-commerce for rural consumers (Chatterjee, 2019), it is necessary to distinguish between the two concepts. In the context of this paper, rural e-commerce pertains to the use of e-commerce by rural producers to sell their products beyond their boundaries, along with the organization of the community towards the selling of certain rural products. Therefore, the purchase and sale of goods and services by rural producers through a variety of online platforms such as websites, mobile apps, or social media is rural e-commerce within this context.

Small and Medium Enterprises (SMEs) in China

Small and Medium-sized Enterprises, or SMEs, are often considered the backbone of any economy. In the context of China, SMEs are defined by certain criteria of sizes, assets, number of employees, and their revenue annually. Normally, the organization is considered a small enterprise if they have either less than 100 employees, has assets worth less than RMB 40 million, or has a business revenue of less than RMB 30 million (Liu, 2008; Garcia-Martinez, L. J., Kraus, S., Breier, M., & Kallmuenzer, A., 2023). The specific criteria for small and medium enterprises in each business are given in Figure 1.

Size Category	Industries	Employment-based	Total assets	Business revenue
Small	Industry	< 300	<¥ 40million	< ¥ 30million
	Construction	< 600	<¥ 40million	<¥ 30million
	Wholesale	<100		<¥ 30million
	Retail	<100		<¥ 10million
	Transport	<500		<¥ 30million
	Post	<400		<¥ 30million
	Hotel & restaurant	<400		<¥ 30million
Medium	Industry	300- 2000	¥ 40million-400million	¥ 30million-300million
	Construction	600-3000	¥ 40million-400million	¥ 30million-300million
	Wholesale	100-200		¥ 30million-300million
	Retail	100-500		¥ 10million-150million
	Transport	500-3000		¥ 30million-300million
	Post	400-1000		¥ 30million-300million
	Hotel & restaurant	400-800		¥ 30million-150million

Note: SME meet one or more of the conditions. ME should meet three conditions, the others are SE.

Figure 1: Shows Definition of SMEs in China (Liu, 2008)

SMEs are considered very important in China, with the government supporting their development and growth by implementing various policies and incentives such as tax incentives, access to government and private financing, reduced bureaucracy, and overall financial assistance. These incentives are created due to the immense economic contribution of the SMEs towards China's GDP, especially in the sectors of services, retail, manufacturing, and technology, while also providing jobs to millions of Chinese citizens across the urban cities around China. Moreover, SMEs are responsible for the advancement of technology in China, with various start-ups generating immense revenue and technological developments toward the Chinese goal of a technology-driven society (Liang et al., 2018; Mensah, I. K., Wang, R., Gui, L., & Wang, J., 2023). Therefore, China has also supported the growth of SMEs in the rural regions of China, especially as it could help drive economic development within the region (Manzoor et al., 2021).

E-commerce within the Rural Context of China: Taobao Villages

E-commerce has been growing considerably in the rural regions of China, especially due to the increased growth of the Taobao Marketplace platform, the largest e-commerce platform in China. The concept of Taobao village has emerged, where many merchants work in synergy with each other in the village cluster and use the e-commerce platform of Taobao to achieve their economy of scale for better profitability (Lulu, 2019; Zhang, N., Yang, W., & Ke, H., 2024). There are three distinct criteria for qualifying as the Taobao villages, namely:

1. Merchants within the villages are registered as residents within the village and operate primarily from the village

2. The annual Grand Merchandise Volume, or the total value of the merchandise sold by the merchants within the village, exceeds more than RMB 10 million.

3. The villages should contain at least 50 merchants or 10% of the village households that are registered online at the village.

In 2009, only three villages in China were Taobao Village as per the above criteria, while there were 2118 Taobao villages in 2017 across 24 provinces. Eastern China contains most of the Taobao villages, accounting for 97.8 percent of all Taobao villages in China, with large concentrations in the eastern coastal provinces of Guangdong, Jiangsu, and Zhejiang. The pandemic has further enhanced the sales traffic on Taobao Villages with the introduction of various possibilities, such as live-streaming and personal product information to attract new consumers and increase sales. Agricultural produce is one of the major sales categories in the Taobao villages, with 80 villages accounting for more than RMB 20 million (Lulu, 2019; AliResearch, 2020; Zhang, N., Yang, W., & Ke, H., 2024). Taobao Villages have traditionally emerged from the more impoverished rural villages in China. Taobao Village has been instrumental in alleviating poverty, with greater sales of agricultural products enhancing the development of agriculture and overall revenue generation in otherwise impoverished villages. It is also helping to create industry clusters across these regions as various labor-intensive and technology-intensive industry clusters are forming around these villages to accommodate the growing capacity of e-commerce to sell more variety of products online (AliResearch, 2020; Pei, R., Chen, X., & Li, X.,2024).

Factors affecting the Adoption of E-commerce in Rural China

During the early introduction of e-commerce in China, when its diffusion was being studied. The states that various factors such as poor infrastructure, lack of capabilities towards assessing and guaranteeing buyer and seller credibility, and content censorship were barriers to the effective diffusion of e-commerce. The government promotion of e-commerce through industrial and regulatory policies, encouragement and sponsorship of e-commerce projects, and overall general promotion of the IT industry were the main facilitators towards e-commerce adoption/diffusion. Various factors such as the lack of access to computers, the lack of information-sharing capacities within the formal, the social norms of tolerating failures, the lack of internal trust within the firms, and the incapacities of the various firms to adapt to rapid change being the main inhibitors of the adoption of E-commerce in China. Other studies have also explored many subjective, environmental, or support factors that have impacted the adoption and diffusion of e-commerce across China (Zhong, Y., Guo, F., Wang, X., & Guo, J., 2024; Ji, C., Dong, X., & Lin, W., 2024). Behavioral attitudes are the primary factors that influence the merchant's willingness to upgrade e-commerce digitally, and the subjective norms are the secondary factor towards upgrading digitally to e-commerce, where the perception of greater local participation in e-commerce enhances the willingness to upgrade their rural e-commerce digitally (Wang, Y., & Zhang, Z.,2023). The various aspects such as human capital, social networks, the ICT infrastructure, location, resource endowments, and intergenerational support for the less educated farmers from their family members can facilitate the adoption of e-commerce in rural China (Lin, H., et al. (2024). That various factors within the Technology, Organization, and Environment frameworks (Kakhki, M. D., & Sajadi, S. M. (2024), especially the relative advantage, organizational readiness, competitive pressures, and government support positively impacted the willingness of agri-business enterprises in Longsheng, China. Those various factors such as the cost of land and transportation, and agglomeration of the e-commerce hubs, along with the region being traditionally industrial and labor being quite cheap, led to the growth and expansion of Taobao villages across Zhejiang Province.

Technology-Organization-Environment, or TOE Theory

Across these conceptual frameworks, the Technology Organization and Environment or TOE framework was chosen due to its capacity to explain factors that drive an entity's decision towards adopting certain technologies. The TOE framework provides contextual information about the firm and how it influences the adoption and implementation of the technology. The TOE framework examines three different elements of the firm's context that affect its adoption behavior, namely the technological, organizational, and environmental contexts (Baker, 2011; Minh, H. T. T., et al, 2024). The Technological context considers all the technological factors into consideration for the adoption of new technology. The "relative advantage" as an extension of the DoI model can be considered a technological factor if the technology is posited to enhance the performance and productivity of the organization or entity in consideration. Similarly, "trust" can be a technological context, when defined as the "cost-benefit trade-off concerning the risks related to technological adoption". Therefore, the technological perspective takes into consideration the necessity and characteristics of the technology in consideration and how it impacts the organization, and the organizational perception of the technology in question (Chittipaka, et al., 2022; Idris et al., 2022). The organizational context considers many internal factors that are responsible for the adoption of new technology. The Environmental context considers the various characteristics of the external world such as the marketplace regulation and structure, government regulations and policies, and technology infrastructures, that can impact the adoption of new technology.

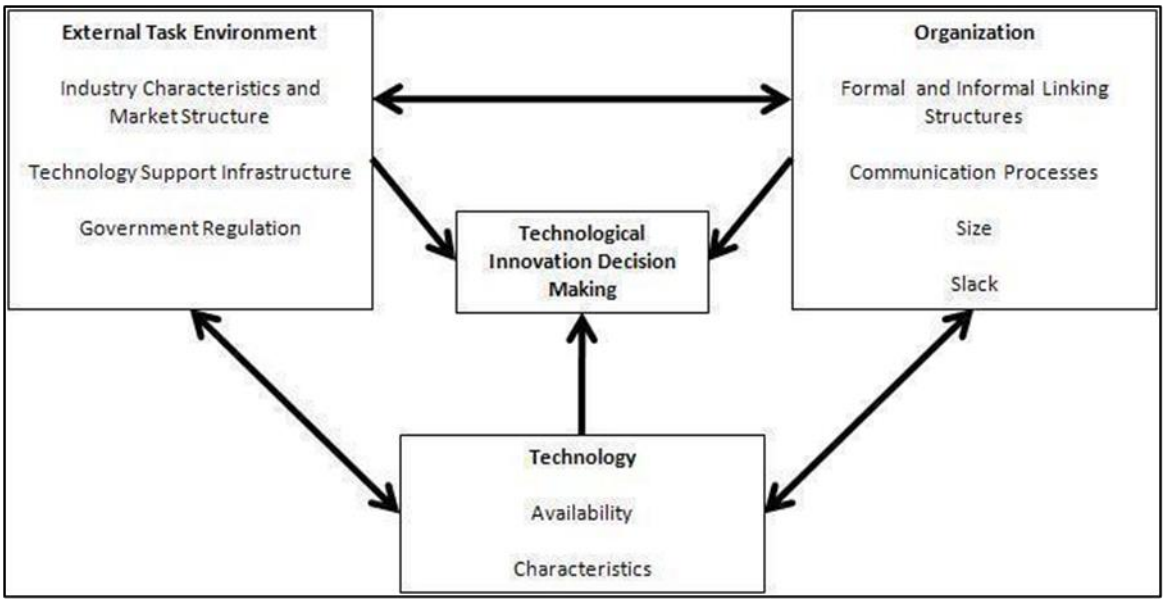

Figure 2: Shows Technology-Organization-Environment Model (Wani & Ali, 2015).

Overall, these three elements, technological, organizational, and environmental contexts, serve as the factors of technology adoption, either as facilitators or barriers to technological adoption. The TOE model was chosen as the main theoretical framework for understanding the adoption of rural e-commerce. The traditional approach of using only a singular framework is mostly not effective in understanding the contextual issues of different organizations that are adopting e-commerce, especially when studied in the context of developing countries where the literature is very scant (Idris et al., 2017). TAM, UTAUT, and TPB are very deterministic models that focus primarily on the user intentions and are very

limited in scope with little consideration of the many other factors that influence the adoption of e-commerce, whereas DoI and RBT ignore contextual issues of the external environment that have a strong impact on the adoption of technology in developing nations. Therefore, this study utilizes the TOE framework that serves as the starting point for understanding the determinants of technological adoption (Salah, O. H., & Ayyash, M. M. (2024). However, it also remains very limited in its scope, especially in not being able to inspect the complex social contexts that exist mainly within the organization and with the external environment. Therefore, this study will also consider the elements of other frameworks such as relative advantage from RoI, perceived complexity or ease of use from UTAUT/TAM models, and monetary resources from RBT theory to include in the respective TOE perspectives towards creating a more holistic framework to assess the factors affecting the adoption of e-commerce.

Research Methodology

Population and Sample Size

For the quantitative phase, the sample consists of the online vendors at Taobao Villages in the coastal province of Zhejiang. Due to the large population and the exact population unknown, the sample size of 384 participants was calculated from W.G. Cochran's unknown formula of 95% confidence and 5% tolerance. The coastal province of Zhejiang was selected for the questionnaire survey because it consists of the largest number of Taobao villages in China. A random sampling of the participants was done to mitigate any potential biases in the selection of the participants, and such that the sample is representative of the actual population of the entrepreneurs in Taobao Villages.

Data collection

To create the items for the survey questionnaire, prior studies and literature were considered. An online survey questionnaire was used to collect data from the relevant participants.

Data Analysis

The statistical analysis included KMO and Bartlett tests, averages, percentages, means, standard deviations, and a structural equation model.

Conceptual Framework

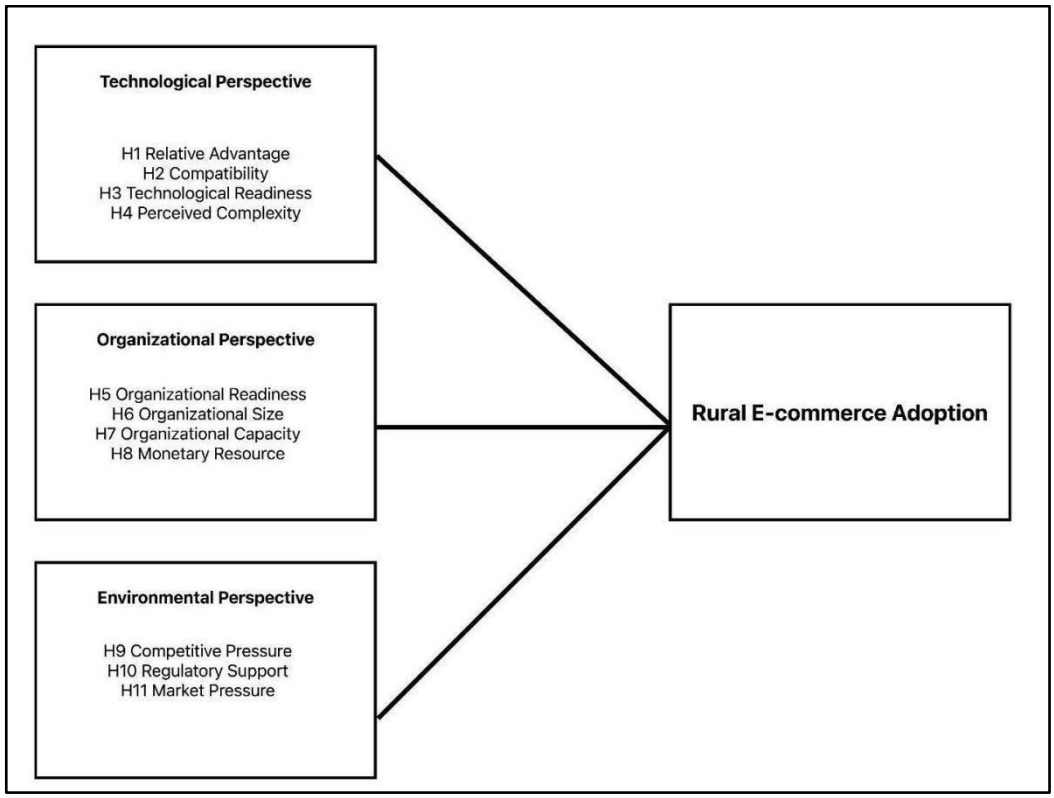

Figure 3: Shows Conceptual TOE Framework for Rural E-commerce Adoption

Subfactors Considered within the TOE Model & Hypothesis Development

For the scope of this study, 11 broad sub factors were considered.

Technological Factors

This paper considers four subfactors of "relative advantage", "compatibility", "technological readiness" and "perceived complexity" of adopting e-commerce as the technological factors.

H1: Relative Advantage significantly impacts the adoption of e-commerce in rural China.

H2: Compatibility significantly impacts the adoption of e-commerce in rural China.

H3: Technological Readiness significantly impacts the adoption of e-commerce in rural China.

H4: Perceived Complexity significantly impacts the adoption of e-commerce in rural China.

Organizational Factors

This paper considers four subfactors of "organizational readiness", "organizational size", "organizational capacity" and "monetary resources" of adopting e-commerce as the technological factors.

H5: Organizational Readiness significantly impacts the adoption of e-commerce in rural China.

H6: Organizational Size significantly impacts the adoption of e-commerce in rural China.

H7: Organizational Capacity significantly impacts the adoption of e-commerce in rural China.

H8: Monetary Resources significantly impact the adoption of e-commerce in rural China.

Environmental Factors

This paper considers three sub-factors of "competitive pressure", "regulatory support", and "market pressure" of adopting e-commerce as the environmental factors.

H9: Competitive Pressure significantly impacts the adoption of e-commerce in rural China.

H10: Regulatory Support significantly impacts the adoption of e-commerce in rural China.

H11: Market Pressure significantly impacts the adoption of e-commerce in rural China.

Research Finding

Research results

The important factors affecting the success of developing or implementing e-commerce in rural areas include Relative Advantage, Compatibility, Technological Readiness, Perceived Complexity, Organizational readiness, Organizational Size, Organizational Capacity, Monetary Resources, Competitive Pressure, Regulatory Support, Market Pressure, where the reliability of each factor is shown in the Cronbach's alpha value in Table 1.

Table 1: Cronbach's alpha for the factors.

Factors	Cronbach's Alpha
Relative Advantage	0.842
Compatibility	0.903
Technological Readiness	0.819
Perceived Complexity	0.890
Organizational readiness	0.912
Organizational Size	0.843
Organizational Capacity	0.832
Monetary Resources	0.935
Competitive Pressure	0.828
Regulatory Support	0.915
Market Pressure	0.808

From Table 1. examines the reliability of the variable measurement items. As all variables have Cronbach's alpha value greater than 0.7, there is a strong reliability of the questions in consideration, as they measure the variables that they are supposed to.

To conduct the Exploratory Factor Analysis, Kaiser-Meyer-Olkin values were assessed, to assess if the data was suitable for the factor analysis. The KMO analysis indicates if the data is appropriate for factor analysis. The KMO value was calculated at 0.857, suggesting

suitability for factor analysis. The data was then analyzed using Exploratory Factor Analysis (EFA). Table 2 shows the rotated component matrix (RCM's) factor loadings. The factor loadings for the RCM for all items and their respective latent variables were greater than 0.5, which suggests that the items correspond to their respective factors. All questions are strongly correlated to their respective factors, which means that the latent variables are well justified to be used within the model.

Table 2: Shows factor loadings for each item within the factors

Construct	Items	Factor Loadings
Relative Advantage	1	0.716
	2	0.783
	3	0.825
Compatibility	1	0.801
	2	0.845
	3	0.895
Technological Readiness	1	0.732
	2	0.867
	3	0.727
Perceived Complexity	1	0.772
	2	0.881
	3	0.918
Organizational Readiness	1	0.697
	2	0.817
	3	0.869
Organizational Size	1	0.728
	2	0.786
	3	0.752
Organizational Capacity	1	0.828
	2	0.704
	3	0.844
Monetary Resources	1	0.779
	2	0.860
	3	0.789
Competitive Pressure	1	0.827
	2	0.720
	3	0.859
Regulatory Support	1	0.849
	2	0.695
	3	0.839
Market Pressure	1	0.871
	2	0.899
	3	0.756

That all the Composite Reliability (CR) values are greater than 0.7, which suggests that all the items within the factor/ latent variable are consistently measuring the respective variable. This establishes the strong reliability of the constructs within the measurement model.

Similarly, the AVE models are also all greater than the recommended value of 0.5, which satisfies the recommended threshold of convergent validity. As shown in Table 3.

Table 3: Shows Composite Reliability and Average Variance Extracted

Constructs	CR	AVE
Relative Advantage	0.862	0.642
Compatibility	0.883	0.713
Technological Readiness	0.901	0.728
Perceived Complexity	0.907	0.706
Organizational readiness	0.874	0.687
Organizational Size	0.879	0.757
Organizational Capacity	0.918	0.773
Monetary Resources	0.932	0.653
Competitive Pressure	0.885	0.628
Regulatory Support	0.867	0.676
Market Pressure	0.893	0.712

The square root of the AVE, as presented in Table 4, is much higher than the correlation between the latent variables observed, which suggests that there is an adequate discriminant validity of the constructs or that they are distinct from each other. Therefore, the data is now useful for structural equation modeling, or SEM, and accurately represents the underlying relationship between the unique latent variables. Here, discriminant validity allows us to test the model.

Table 4: Shows Discriminant Validity of the Factors.

	RA	Com	TR	PC	OR	OS	OC	MR	CP	RS	MP
RA	0.801										
Com	0.432	0.844									
TR	0.02	0.090	0.854								
PC	-0.059	-0.039	0.175	0.841							
OR	0.357	0.286	-0.010	0.112	0.828						
OS	0.091	0.199	0.129	0.382	0.007	0.869					
OC	0.238	-0.084	0.263	0.218	0.298	-0.103	0.878				
MR	0.480	0.245	0.042	0.025	0.062	0.412	0.505	0.808			
CP	-0.007	0.433	0.407	0.481	0.437	0.079	0.356	-0.163	0.793		
RS	0.195	0.301	-0.054	-0.081	0.151	0.273	0.121	0.314	0.256	0.822	
MP	0.147	0.071	0.339	0.202	0.370	0.184	0.228	0.191	0.070	-0.015	0.843

Note: RA: Relative Advantage; Com: Compatibility; TR: Technological Readiness; PC: Perceived Complexity; OR: Organizational Readiness; OS: Organizational Size; OC: Organizational Capacity; MR: Monetary Resources; CP: Competitive Pressure; RS: Regulatory Support; MP: Market Pressure.

The model was then tested using the Structural Equation Modeling (SEM), whose values are then given in Table 5. This table suggests if the variables all fit the hypothesis model and suggests how much each latent variable supports the hypothesis on how they impact the dependent variable of e-commerce adoption. The table supports all hypotheses for the p-value less than 0.1.

Table 5: Shows path analysis results for the Structural Equation Modeling (SEM) of the key factors that contribute towards the successful development or adoption of rural e-commerce.

Parameters	Estimate	SE	CR	P	Hypothesis	Results
ECA← RA	0.398	0.142	4.488	<0.01	H1	Supported
ECA← Com	0.215	0.041	2.680	<0.01	H2	Supported
ECA← TR	0.348	0.095	3.898	<0.01	H3	Supported
ECA← PC	-0.382	0.112	4.167	<0.01	H4	Supported
ECA← OR	0.286	0.062	3.001	<0.01	H5	Supported
ECA← OS	0.203	0.025	2.265	<0.01	H6	Supported
ECA← OC	0.410	0.147	5.222	<0.01	H7	Supported
ECA← MR	0.312	0.088	3.602	<0.01	H8	Supported
ECA← CP	0.223	0.054	2.845	<0.01	H9	Supported
ECA← RS	0.287	0.076	3.456	<0.01	H10	Supported
ECA← MP	0.389	0.133	4.220	<0.01	H11	Supported

Note: ECA: E-Commerce Adoption; RA: Relative Advantage; Com: Compatibility; TR: Technological Readiness; PC: Perceived Complexity; OR: Organizational Readiness; OS: Organizational Size;
OC: Organizational Capacity; MR: Monetary Resources; CP: Competitive Pressure; RS: Regulatory Support; MP: Market Pressure.

The path analysis results, as displayed in Table 5, illustrated the relationships between various factors and the adoption of e-commerce within rural areas. The analysis revealed that several factors significantly influenced e-commerce adoption. These included: Relative Advantage (RA): The degree to which e-commerce was perceived as superior to traditional commerce exerted a positive impact on adoption ($\beta = 0.398$, $p < 0.01$). Compatibility (Com): The extent to which e-commerce aligned with existing values and needs also demonstrated a positive influence ($\beta = 0.215$, $p < 0.01$). Technological Readiness (TR): The availability of the technological infrastructure and skills necessary for e-commerce adoption played a significant role ($\beta = 0.348$, $p < 0.01$). Perceived Complexity (PC): The level of difficulty associated with using e-commerce had a negative impact on adoption ($\beta = -0.382$, $p < 0.01$), suggesting that platforms perceived as easier to use were more likely to be adopted. Organizational Readiness (OR): The preparedness of organizations to adopt e-commerce, encompassing their strategies and resources, exhibited a positive influence ($\beta = 0.286$, $p < 0.01$). Organizational Size (OS): The size of the organization also demonstrated a positive impact on e-commerce adoption ($\beta = 0.203$, $p < 0.01$). Organizational Capacity (OC): The organization's ability to implement and manage e-commerce initiatives significantly influenced adoption ($\beta = 0.410$, $p < 0.01$). Monetary Resources (MR): The availability of financial resources to invest in e-commerce initiatives exerted a positive impact ($\beta = 0.312$, $p < 0.01$). Competitive Pressure (CP): The pressure to adopt e-commerce to maintain competitiveness also positively influenced adoption ($\beta = 0.223$, $p < 0.01$). Regulatory Support (RS): Supportive government policies and

regulations facilitated e-commerce adoption ($\beta = 0.287$, $p < 0.01$). Market Pressure (MP): The demand for e-commerce from consumers and prevailing market trends played a significant role in driving adoption ($\beta = 0.389$, $p < 0.01$). These findings indicated that successful e-commerce adoption in rural areas was driven by a combination of technological, organizational, economic, and market factors. By addressing these factors, policymakers and businesses can promote the adoption of e-commerce and unlock its potential benefits for rural communities.

From Table 5, from the hypothesis testing, the factors that contributed to the success of the development or implementation of e-commerce in rural areas, ranked from most to least, were organizational capability (β=0.410), relative advantage (β=0.398), market pressure (β=0.389), perceived complexity (β=-0.382), technological readiness (β=0.348), monetary resources (β=0.312), organizational readiness (β=0.286), regulatory support (β=0.287), competitive pressure (β=0.223), compatibility (β=0.215), and organizational size (β=0.203). Which can be summarized as shown in Figure 4.

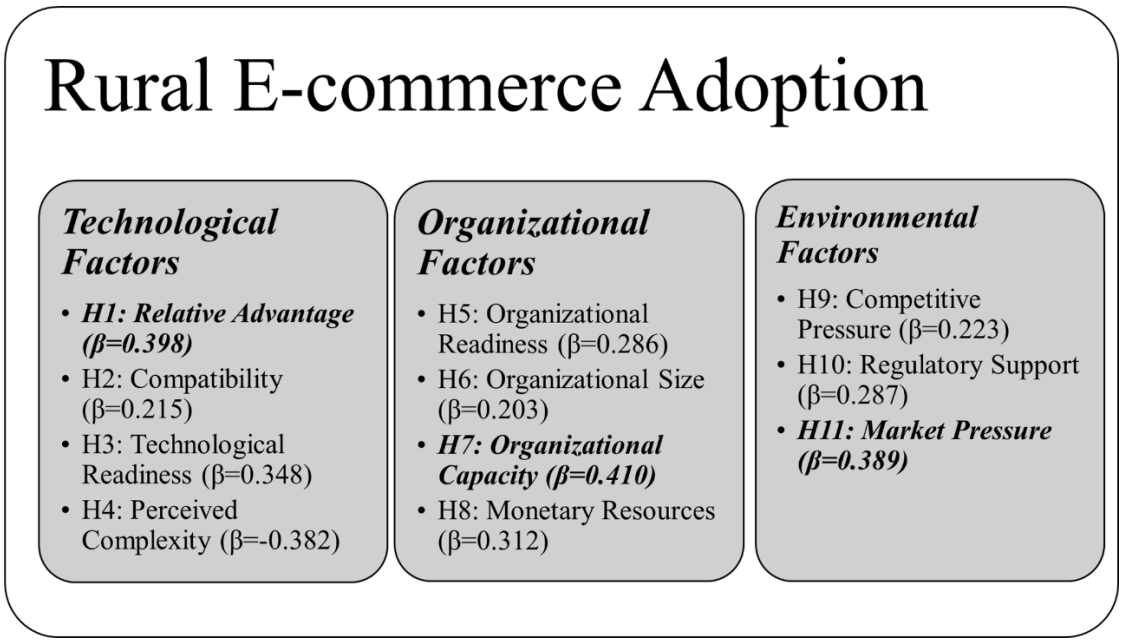

Figure 4: Show the factors that contributed to Rural E-commerce Adoption.
(Most of the factors were organizational capability, relative advantage, and market pressure)

Discussion/Conclusion

The research findings on factors contributing to the success of rural e-commerce development align with existing studies in the field. For instance, the high influence of organizational capability (β=0.410) is supported by the Resource-Based View (RBV) theory, which posits that organizational competencies, such as leadership and management resources, are critical for adopting innovations (Atobishi, T., et al., 2024; Wartini, S., et al., 2024). Similarly, relative advantage (β=0.398) is a significant factor in technology adoption, as it is often associated with increased operational efficiency and competitiveness (Granić, A., 2024). Market pressure (β=0.389) also plays a crucial role, particularly in dynamic

and competitive environments where organizations are compelled to adopt new technologies to maintain their market position (Huang, S. Z., et al, 2024). The negative impact of perceived complexity (β=-0.382) underscores the challenges that arise when innovations are difficult to understand and implement, leading to delays in adoption. Other factors like technological readiness (β=0.348) and organizational readiness (β=0.286) further emphasize the importance of preparedness in adopting new technologies. These findings are consistent with the Technology-Organization-Environment (TOE) framework, which highlights the significance of both internal capabilities and external pressures in the adoption process. In conclusion, the research corroborates the importance of organizational and technological factors in successful e-commerce implementation in rural areas, with implications for policymakers and business leaders aiming to foster rural digital transformation. (Badghish, S., & Soomro, Y. A., 2024; Minh, H. T. T., et al., 2024; Li, G., & Zhang, H., 2024).

The factors that impact the adoption of e-commerce within the rural Chinese context. From research results a Technological-Organizational-Environmental (TOE) factor was selected to build the hypothesis model. Similarly, to understand the latent variables affecting the adoption of the model, the technological perspective of “relative advantage,” “compatibility,” “technological readiness,” and “perceived complexity”; organizational perspective with four latent variables of “organizational readiness,” “organizational size,” “organizational capacity,” “monetary resources”; and, the environmental perspective of three latent variables with “competitive pressure,” “regulatory support,” and “market pressures,” were adopted. These factors were first assessed with quantitative analysis using structural equation modeling and necessary analyses. Then, the qualitative analysis with thematic analysis was conducted to understand how and why these latent variables impact e-commerce adoption within the Chinese context. The study found through SEM that the hypothesis model developed had adequate consistency and validity, and adequately had goodness-of-fit with the observed data. Overall, all eleven factors had a statistically significant impact on technology adoption.

Suggestion

Suggestions for research utilization

1. Promote Technological Readiness: Invest in information and communication technology infrastructure in rural areas to ensure comprehensive and efficient internet access. Provide digital skills training to entrepreneurs and residents to enhance their capacity to engage in e-commerce.

2. Provide Financial Support: Implement measures to support rural entrepreneurs financially, such as low-interest loans, grants for online business development, and tax incentives. This will help reduce barriers to accessing capital and encourage e-commerce adoption.

Suggestions for future research

1. Study In-depth Impacts: Conduct further research on the broader impacts of e-commerce on rural society, including its effects on community lifestyles, social changes, and cultural transformations. This will provide a more comprehensive understanding of the multifaceted implications of e-commerce in rural areas.

2. Expand Research Scope: Conduct comparative studies on the factors influencing e-commerce success in rural versus urban areas. This will highlight the differences and inform

the development of tailored policies for each context, promoting effective e-commerce adoption across diverse regions.

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