Rural Digital Model for Upgrade a Rural to an Efficient Digital Society case study economic of SMEs in Urumqi China.

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Abstract

This Article aimed to study (1) the components and factors for upgrading a rural to an efficient digital society; (2) To analyze the components and factors for upgrading a rural to an efficient digital society; (3) To develop a rural digital model for upgrade a rural to an efficient digital society. The research was a stratified random sampling method methodology research. The population was People in urban areas in northwest China. Due to the large population and the exact population being unknown, totaling 400; The accuracy of the questionnaires is 0.95., obtained by the Stratified random sampling technique is adopted, totaling 400. The statistics used for data analysis were IOC, Average, Standard Deviation, Pearson correlation and KMO, and Bartlett's test of sphericity

(1) Digital upgrading can greatly enhance production efficiency in rural areas and ensure they better adapt to market demands. Through the utilization of digital technologies, rural communities can achieve precise production planning and scheduling, reduce costs, and improve the quality of goods and services, leading to improved efficiency overall.

(2) The process of digital upgrading offers rural areas a plethora of new business opportunities and room for growth. In this digital era, rural areas have the potential to expand their markets through digital platforms, allowing for cross-regional and cross-industry collaborations, and fostering accelerated growth within these communities.

(3) A significant outcome of the digital transformation in rural areas is the creation of increased job opportunities for local residents, leading to improved income levels and an enhanced quality of life.

Keywords: Rural revitalization, Rural governance system, Digital village, Digital government, Digital Society, Digital economy, Digital Village, Platform

Introduction

Chapter 1 sets the stage for your research. In this chapter, you begin by discussing the background and significance of your research problem. You introduce the concept of digital village construction and emphasize why it's a critical issue in contemporary rural development. You also outline the specific objectives of your research, providing a clear sense of what you intend to achieve. Additionally, you present your research hypotheses, which are the guiding assumptions you plan to test. You define the scope of your study, specifying the geographical and thematic boundaries, and you present a conceptual framework that provides a theoretical foundation for your research. Key terms are defined to ensure clarity, and you conclude the chapter by discussing the expected benefits that your research is anticipated to bring to the field of rural development and digital transformation.

Chapter 2 dives into the existing body of knowledge related to your research. In this chapter, you review the literature on digital village construction, starting with an exploration of related concepts. You delve into the theoretical foundations underpinning the construction of the digital countryside, providing insights into the intellectual framework of your research. Furthermore, you discuss Lenin's thoughts on rural construction in relation to your study. In the second part of the chapter, you analyze related research both at the national and international levels, offering a comprehensive overview of the current state of knowledge in this area. This chapter plays a crucial role in establishing the theoretical basis for your research and identifying gaps in existing literature that your study aims to address.

Chapter 3 is dedicated to explaining the methodology you employed in conducting your research. Here, you elaborate on the specific research design chosen for your study, whether it's qualitative, quantitative, or a mix of both. You clarify the population under study and provide details on how you determined the appropriate sample size. Additionally, you discuss the research instruments utilized, such as surveys, interviews, or observations, and explain why these methods were chosen. You delve into the data collection process, outlining where and how data was gathered and any relevant time frames. Finally, you touch upon data analysis, explaining the techniques and tools used to analyze the collected data. This chapter is essential for ensuring the transparency and rigor of your research methodology.

Chapter 4 presents the core findings of your research. You start with a section on content analysis, breaking down your analysis into several subsections. These include the analysis of small and medium-sized enterprises (SMEs) in rural areas, the state of digital infrastructure, an assessment of the digital environment, and an evaluation of digital transformation systems. You also discuss the questionnaire used in your research. Following this, you present the results of your data analysis in

accordance with your research objectives. This chapter should provide a comprehensive overview of your research findings, offering insights into the current state of digital village construction and its impact on rural areas.

In Chapter 5, you wrap up your research by presenting your conclusions, engaging in a discussion of the findings, and providing recommendations. In the conclusions section (5.1), you summarize the key takeaways from your study, highlighting how your research objectives were met. The discussion section (5.2) delves deeper into the implications of your findings, comparing them with existing literature and theories. Here, you interpret your results and offer insights into the broader significance of your research. Finally, in the recommendations section (5.3), you provide practical suggestions based on your research findings. These recommendations may be directed towards policymakers, practitioners, or researchers in the field of rural development and digital transformation. This chapter serves as the culmination of your research, tying together the various threads of your study and offering valuable insights for future endeavors in this area.

Research Objectives

1. To study the components and factors for upgrade a rural to and efficient digital society.
2. To analyze the components and factors for upgrade a rural to and efficient digital society.
3. To develop a rural digital model for upgrade a rural to and efficient digital society.

Literature Review

Throughout the literature review, this paper critically assesses the existing body of knowledge, systematically identifies knowledge gaps, and highlights the research contributions that our research will make. Our goal is to gain a comprehensive understanding of the current state of research on digital village construction and rural development while demonstrating the unique value of our research in bridging existing gaps. we conduct a comprehensive literature review to establish the context for our research on digital village construction and rural development. This review encompasses a wide range of sources, including documents, articles, and research papers, with a keen focus on identifying the knowledge gap that our research aims to address.

1. we explore the various facets of digital village construction. We analyze relevant literature, which includes findings from documents, articles, and research papers, to gain a deeper understanding of this concept. By reviewing existing definitions, interpretations, and key components, we uncover the evolving trends and shifts in how digital village construction has been conceptualized. Additionally, we

critically evaluate the strengths and weaknesses of current approaches, setting the stage for our research to contribute novel insights.

2. In-depth research on the theoretical basis of digital rural construction. Refer to and describe the relevant theories and models presented in the literature, and illustrate their impact on previous rural development research and practice. In addition, this paper assesses the applicability and limitations of these theoretical frameworks in the context of this study. This analysis helps to identify the theoretical gaps that can be filled by the research in this paper.

3. The third section pays special attention to Lenin's rural construction thought. Here we not only describe Lenin's thought but also provide insights drawn from historical documents and academic analysis. It emphasizes the profound influence of Lenin's thought on the strategy and policy of rural development. Crucially, we assess the relevance of Lenin's ideas in the modern context of digital village construction, showing how a historical perspective can inform contemporary research.

4. This paper shifts the focus to relevant research at the national and international levels. Section 2.2.1 systematically reviews the national research results on digital rural construction and rural development. By identifying common themes, approaches and gaps in existing research, we highlight areas where our research can make a substantial contribution. In Section 2.2.2, the paper extends the analysis to international studies, summarizing key findings and insights from different countries and regions. This paper compares international digital village construction methods with domestic ones to identify cross-cultural and global trends that will inform the study of this paper.

The literature review in Chapter 2 serves as a foundation for the research by thoroughly examining relevant theories and concepts, and by identifying specific areas where these concepts are reviewed for use in the research.

Firstly, the literature review critically assesses the concept of "digital village construction" by referencing a variety of sources, including documents, articles, and research papers. This review aims to understand the multifaceted nature of digital village construction, focusing on how it has been defined, interpreted, and applied in the literature. It provides a nuanced perspective on the concept, considering various dimensions such as technological infrastructure, community development, and government policies.

Furthermore, the review analyzes the theoretical underpinnings of rural development, particularly as they relate to the construction of the digital countryside. It delves into relevant theories and models proposed in the literature, highlighting their influence on past research and practice in rural development. The objective is to assess the suitability and limitations of these theoretical frameworks

within the context of the research. This analysis helps determine which theoretical foundations are most relevant and applicable to the study's objectives.

Additionally, the literature review investigates historical perspectives, such as Lenin's Thought of Rural Construction, as they relate to rural development and digital village construction. It doesn't merely present Lenin's ideas but also draws insights from historical documents and scholarly analyses. This historical context is explored to understand how past ideologies can inform contemporary research and policy recommendations.

Furthermore, the review extends its analysis to the national and international levels, systematically examining research studies related to digital village construction and rural development. It identifies common themes, methodologies, and gaps in existing research. This process helps pinpoint specific areas where the research can contribute to the current body of knowledge.

In summary, the literature review demonstrates that the authors have engaged deeply with theory and concepts related to digital village construction and rural development. It highlights the critical evaluation of these concepts, their relevance to the research objectives, and the areas within the literature where the authors aim to make contributions by addressing knowledge gaps. This comprehensive approach ensures that the theoretical foundations of the research are well-established and that the study is situated within the broader context of existing scholarship.

Conceptual Framework

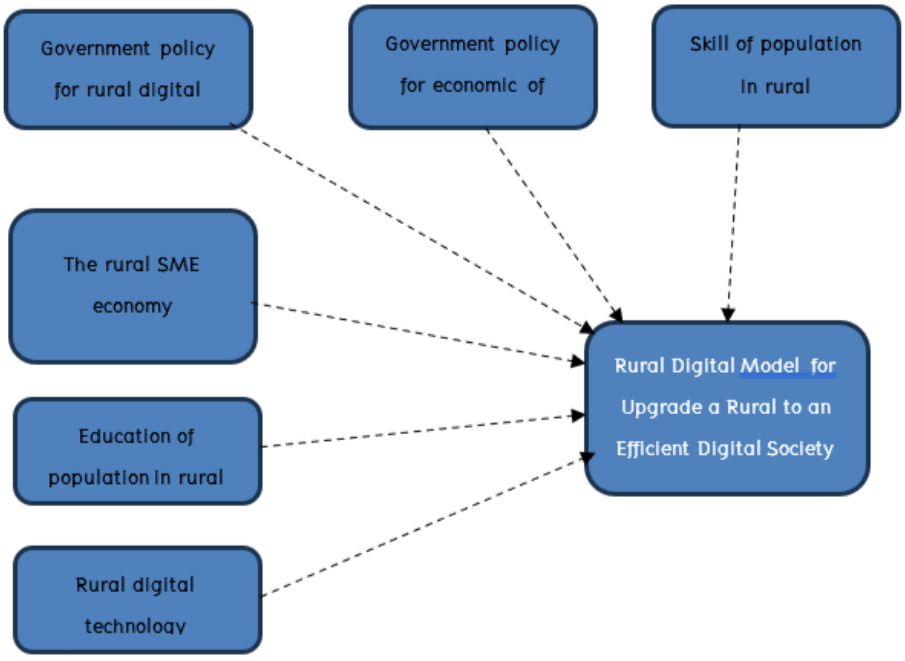

Fig.1 Conceptual Framework

Research Methodology

Our research is aimed at studying and comprehending the current state of digital transformation within small and medium-sized enterprises (SMEs) in a city in northwest China. The focus is on various aspects, including their awareness, participation, and satisfaction with digital transformation, as well as their use of digital technology and related platforms. The primary goal is to understand the ground realities of digital transformation in SMEs from a multi-dimensional perspective, particularly emphasizing existing challenges.

Sample:

The examples include: People in urban areas in northwest China. Due to the large population and the exact population unknown, the sample size can be calculated from W.G. Cochran's unknown sample size formula, which defines a 95% confidence level and a 5% tolerance (Kalyavanichbanban, 2006).

$$n = \frac{0.5(1-0.5)(1.96)^2}{(0.05)^2}$$

$$= 384.16$$

To ensure appropriateness in evaluating and analyzing data, and to cater for any possible non-responses or ineligible responses, we rounded up the sample size to 400. Consequently, we distributed 400 questionnaires to SMEs within our target population for the research.

Research Instruments

Our research methodology deploys a structured questionnaire as the primary research instrument, designed to gather qualitative and quantitative data about the digital transformation within the SMEs. This questionnaire includes a variety of question types such as multiple-choice questions, Likert scale questions, and open-ended questions to provide a comprehensive understanding of the topic.

The participants for the questionnaire survey are selected using a stratified random sampling technique. Given the absence of a fixed sampling framework, we aim to ensure a representative sample by randomly selecting SMEs across different sectors and sizes within the targeted city in northwest China. This random selection minimizes bias and enhances the representativeness of the sample, thereby increasing the accuracy and generalizability of our research findings.

During the sampling process, precautions are taken to prevent the introduction of any personal preference factors by the researcher. The sampling is done adhering to principles of objectivity and

fairness, ensuring that all SMEs within the defined population have an equal opportunity to be included in the study.

The collected data from the questionnaires will be analyzed using statistical methods to calculate sample indicators and extrapolate the overall indicators for the research. The results will then be interpreted and discussed in light of existing literature on the digital transformation of SMEs.

Data Collection

According to the prepared interview outline, interviews were conducted with small and medium–sized enterprises, residents, and rural cadres around a city in Northwest China to understand their views on the construction of digital countryside, their specific understanding, attitude, and willingness to the construction of digital countryside, current achievements, difficulties encountered, areas in need of improvement, and opinions and suggestions for future planning. Then a transcript of the interview was formed. Finally, the obtained survey data and interview records are classified and sorted. Form histograms, pie charts, bar chart,s and other charts to display the survey results more visually. At the same time, the opinions and suggestions of the survey objects and respondents on the construction of digital countryside are sorted out, and the causes and solutions behind the problems are analyzed.

Data analysis

I used the SPSS analysis method to make a specific analysis of the collected valid data.In order to analyze the data, we conducted the following data analysis.

1. Analysis and conclusion from data collection from the research questionnaire.

2. Statistics used to analyze data require that the answers be a rating scale, which allows respondents to choose to answer according to their own opinions divided into 5 levels.

Statistics used to analyze user needs include IOC, Percentile, Average, Standard Deviation and Multiple Linear Regression Analysis.

Research Results

1. To study the components and factors for upgrade a rural to and efficient digital society.

Table 1 The general information of respondents.

The general information	Sample	Percentile (%)
Gender		
Man	154	38.50
Female	246	61.50

The general information	Sample	Percentile (%)
Total	400	100
Age		
18-30 years old and below	214	53.50
31-50 years old	66	16.50
51-65 years old	60	15.00
65 years old and above	60	15.00
Total	400	100
Annual household income		
10,000 to 50,000 yuan	154	38.50
60,000 to 100,000 yuan	134	33.50
110-150,000 yuan	94	23.50
160,000 yuan and above	18	4.50
Total	400	100
Education level		
primary school and below	60	15.00
high school and below	114	28.50
Junior college	122	30.50
bachelor and above	104	26.00
Total	400	100
Annual earnings		
10,000 to 50,000 yuan	154	38.50
60,000 to 100,000 yuan	134	33.50
110-150,000 yuan	94	23.50
160,000 yuan and above	18	4.50
Total	400	100

From Table 1, it was found that personal factors of the respondents were most are female, 61.50 percent, aged between 18–30 years, 53.50 percent, followed by 31 – 50 years, 16.50 percent, most have a college degree, 30.50 percent have an annual household income of 10,000 to 50,000,

calculated as a hundred. 38.50 each, annual income is between 10,000 to 50,000 yuan. It is thought that the personal factors of the respondents found that Most are female, 61.50 percent, aged between 18–30 years, 53.50 percent, followed by 31 – 50 years, 16.50 percent, most have a college degree, 30.50 percent have an annual household income of 10,000 to 50,000, calculated as a hundred. 38.50 per year. Annual income is between 10,000 and 50,000 yuan, accounting for mostly 38.50 percent, respectively.

2. To analyze the components and factors for upgrade a rural to and efficient digital society.

Table 2 The factor of the government policy for rural digital for upgrading a rural to an efficient digital society.

Government policy for rural digital				
No	**Item**	Average ($\bar{x}$)	Standard deviation (S.D)	The level of demand
1	Do you understand the concept of digital village?	4.21	0.89	High
2	Do you know that the state has issued policy documents such as the Outline of the Strategy for the Development of Digital Villages?	4.13	0.82	High
3	How digitalized is rural construction in your area?	4.08	0.85	High
4	How satisfied are you with the network infrastructure (4G, 5G, broadband, etc.) in the local villages?	4.16	0.75	High
5	In your village, has public affairs been handled electronically and online?	4.13	0.79	High
6	Wechat, Alipay payment frequency is? What is the frequency of use of digital financial products such as Yu 'e Bao?	4.09	0.74	High
	Averages	4.13	0.81	High

From Table 2, The results of the analysis of opinions on government policy on digital in the countryside found that opinions on government policy on digital in the countryside were overall at a high level ($\bar{x}$ = 4.13, S.D. = 0.81)

Table 3 The factor of the government policy for economic of SME for upgrading a rural to an efficient digital society.

Government policy for economic of SME				
No	**Item**	Average ($\bar{x}$)	Standard deviation (S.D)	The level of demand
1.	The state has issued a policy to reduce the tax burden of small and medium–sized enterprises. Do you really feel that the policy will help enterprises?	4.37	0.95	High
2.	Has your business received any policy support in recent years?	4.29	0.91	High
3.	IDoes the heavy tax burden of the former small and medium–sized enterprises affect the survival and development of enterprises?	4.31	0.90	High
4.	Special incentives to support the development of new rural industries and new forms of business and industrial integration?	4.53	0.98	High
5.	Optimize the service process for rural private enterprises?	4.16	0.93	High
	Averages	4.33	0.93	High

From Table 3 the results of research on opinions Factors of government policy on the economic aspect of SMEs in upgrading the countryside to an efficient digital society. Government policies regarding the SME economy have a high overall average level (= 4.33, S.D. = 0.93).

Table 4 The factor of the skill of the population in rural for upgrading a rural to an efficient digital society.

Skill of population in rural				
No	**Item**	Average ($\bar{x}$)	Standard deviation (S.D)	The level of demand
1.	Rural talent support policy strength?	4.19	0.83	High
2.	Rural enterprise incentive talent policy	4.17	0.71	High
3.	Support for innovation and entrepreneurship of returning college students?	4.28	0.86	High
4.	When your child graduates, would you like him/her to go back to work in the countryside?	4.21	0.72	High
5.	Do you think that skills training can help enhance the competitiveness of employment?	4.15	0.76	High
	Averages	4.20	0.78	High

From Table 4.results of opinion analysis Factors in the skills of the rural population in upgrading the countryside to an efficient digital society. It was found that the skills of the rural population The overall mean was at a high level (= 4.20, S.D. = 0.78).

Table 5 The factor of the education of population in rural for upgrading a rural to an efficient digital society.

Education of population in rural				
No	**Item**	Average ($\bar{x}$)	Standard deviation (S.D)	The level of demand
1.	Overall satisfaction with your child's school's infrastructure, quality of teachers, safety and educational management?	4.02	0.91	High
2.	Do you know the current national policy on rural compulsory education?	4.03	0.87	High

3.	Is there a gap in the development of compulsory education among different districts within the jurisdiction?	4.04	0.82	High
4.	Do you think the local government pays much attention to improving the quality of rural education?	4.01	0.51	High
5.	Do you think the school's culture and atmosphere are conducive to students' learning	4.01	0.68	High
6.	How often your school arranges teachers to go out for further study, training and learning	4.03	0.85	High
7.	How often do you participate in teaching and research?	4.02	0.82	High
	Averages	4.02	0.78	High

From Table 5 the results of the analysis of educational factors of the rural population in order to upgrade the countryside to an efficient digital society, it was found that the opinions regarding education of the rural population were at a high level (= 4.02, S.D. = 0.78)

Table 6 The factor of the rural SME economy for upgrading a rural to an efficient digital society.

The rural SME economy				
No	**Item**	**Average** ($\overline{x}$)	**Standard deviation (S.D)**	The level of demand
1.	The prospect of the current economic and social development of digital countryside	4.13	0.82	High
2.	Social service system for small and medium-sized enterprises in rural areas to create an excellent environment for entrepreneurship and development	4.17	0.97	High
3.	The pulling effect of industrial chain leading enterprises in the process of digital empowerment	4.16	0.72	High
4.	The core of the transformation from old to new growth drivers is to enhance enterprises' capacity for self-transformation and self-innovation	4.28	0.81	High

5.	Do you think the advantages or disadvantages of vigorously developing small and medium-sized enterprises in rural areas outweigh the disadvantages?	4.09	0.67	High
6.	If you are an investor, will you choose to invest in rural smes?	4.10	0.61	High
	Averages	4.16	0.77	High

From Table 6 the results of the analysis of rural SME economic factors in upgrading the countryside to an efficient digital society found that the average opinion about the rural SME economy was at a high level (= 4.16, S.D. = 0.77)

Table 7 The factor of the rural digital technology for upgrading a rural to an efficient digital society.

Rural digital technology				
No	**Item**	Average ($\bar{x}$)	Standard deviation (S.D)	The level of demand
1.	Do you know anything about rural digital construction?	4.09	0.78	High
2.	How complete do you think the village's network infrastructure (network coverage, signal reception, big data platform, etc.) is?	4.21	0.89	High
3.	Revenue improvement from digital development (e.g., e-commerce)	4.26	0.85	High
4.	Access to agricultural production-related information via the Internet (e.g., weather changes, pests and diseases).	4.20	0.83	High
5.	Digital development to improve productivity	4.18	0.74	High
6.	"Digital + industry" implemented in rural areas (such as tourism agriculture, rural smart tourism, etc.)	4.17	0.79	High
7.	In general, do you think the current digital construction of the village is in place?	4.15	0.71	High
	Averages	4.18	0.80	High

From Table 7 results of opinion analysis Factors of rural digital technology in upgrading the countryside to an efficient digital society It was found that opinions about digital technology in rural areas were at a high level (= 4.18, S.D. = 0.80)

3. To develop a rural digital model for upgrade a rural to and efficient digital society.

Table 8 Correlation analysis among variables

Factor	H_1: Government policy for rural digital	H_2: Government policy for the economic of SME	H_3: Skill of population in rural	H_4: The rural SME economy	H_5: Education of population in rural	H_6: Rural digital technology
H_1: Government policy for rural digital	1					
H_2: Government policy for the economy of SME	0.389**	1				
H_3: Skill of population in rural	0.450**	0.384**	1			
H_4: The rural SME economy	0.544**	0.486**	0.649**	1		
H_5: Education of population in rural	0.690**	0.452**	0.556**	0.686**	1	
H_6: Rural digital technology	0.684**	0.427**	0.368**	0.651**	0.684**	1

Note: * means $p<0.05$, ** means $p<0.01$

Table 8 shows the correlation coefficient between the variables Rural Digital Model for Upgrade a Rural to an Efficient Digital Society case study economic of SMEs in Urumqi China, it was found that each independent variable is related in a positive direction to the dependent variable. The correlation value is between 0.368 – and 0.624, with a statistical significance at the 0.05

Table 9 Multiple Regression Analysis results of the factors for upgrading a rural to an efficient digital society.

Model	B	standard deviation	beta	t	P
c	2.708	0.085	–	31.748	0.000**
H_1: Government policy for rural digital	0.110	0.028	0.198	4.015	0.000**
H2: Government policy for economic of SME	0.058	0.018	0.141	3.435	0.001**
H3: Skill of population in rural	0.250	0.021	0.055	1.174	0.240
H4: The rural SME economy	0.014	0.026	0.031	0.539	0.590
H5: Education of population in rural	0.256	0.031	0.539	8.637	0.000**
H6: Rural digital technology	0.255	0.028	0.489	0.891	0.000**
R^2	0.715				
Adjust R^2 –	0.511				
f	0.505				

Table 9, results of testing the research hypotheses. It was found that the variables that had the most positive influence on the Rural Digital model to upgrade the countryside to an efficient digital society. The case study of the economics of SMEs in Urumqi, China is a study of the rural population.

The results of the regression analysis of factors in upgrading the countryside to an efficient digital society (Y) with a prediction efficiency of 50.50 percent (AdjR2 = 0.505) with strong statistical

significance at the 0.01 level in 4 areas, including education of Population in rural areas and effective digital technology, including the skills of the rural population and the rural SME economy. The forecast equation can be written as follows.

$$\hat{y} = 2.708 + 0.110\ (X1) + 0.580\ (X2) + 0.255\ (X6)$$

Discussions

Our data analysis in Chapter 4 has led us to the following discussions:

(1) Research Objective 1: Investigating the necessary components and factors needed for the transformation of rural areas into efficient digital societies.

The key components and factors identified in our study, which include digital infrastructure and the application environment, echo the theories and studies reviewed in Chapter 2 (Jin, 2018). As Kapoor (2014) previously demonstrated, the importance of the wireless broadband access rate and mobile payment usage rate is widely acknowledged. In addition, our research further accentuates the significance of e-governance services availability and the level of digital education in rural digitalization, a viewpoint that has been neglected in prior literature (Li et al., 2022; Lu & Wang, 2022).

(2) Research Objective 2: Analyzing the necessary components and factors needed for the transformation of rural areas into efficient digital societies.

Our findings reveal interactions among these components and factors, aligning with theories and studies discussed in Chapter 2 (Kunt et al., 2020; Lu & Xu, 2021). For example, we found a positive correlation between the wireless broadband access rate and the mobile payment usage rate, underscoring the importance of integrating different components and factors for rural digitalization (Polasik et al., 2020).

(3) Research Objective 3: Develop a rural digitalization model to upgrade rural areas into an efficient digital society.

Our developed model for rural digitalization holds significant theoretical and practical implications. Policymakers and researchers can use this model to understand and tackle the challenges encountered during rural digitalization (Ma & Wang, 2021; Manyika et al., 2016). Notably, our model underscores the importance of digital infrastructure and the application environment, consistent with theories and studies in Chapter 2 (Liu et al., 2022).

Interestingly, our research points out that the availability of e-governance services plays a pivotal role in the rural digitalization process (Ren & Wang, 2021). Despite being overlooked in previous

research, our data indicate a substantial impact of e-governance service availability on rural digitalization. This is likely because e-governance services provide easy access to information, stimulate community members to use digital tools, and promote rural digitalization (Wang et al., 2022).

In conclusion, our findings not only align with existing theories and research but also bring in fresh perspectives and understandings, setting the stage for further research and practice (Shi & Sun, 2022).

Knowledge from Research

Our research ends in a body of synthesized knowledge. They are presented in concept maps that are concisely-structured and easy to understand. In essence, The main issues serve as the focal point of our research. which summarizes the main points of the study

Moreover, the main themes are linked to the key elements that define our research. including digital infrastructure Community development, policy, and technology. These components provide a comprehensive understanding of our subject matter. We also contextualize our research within the broader national and international landscape. by reviewing key findings, methodologies, and research gaps. This field emphasizes the importance of our education in a global context.

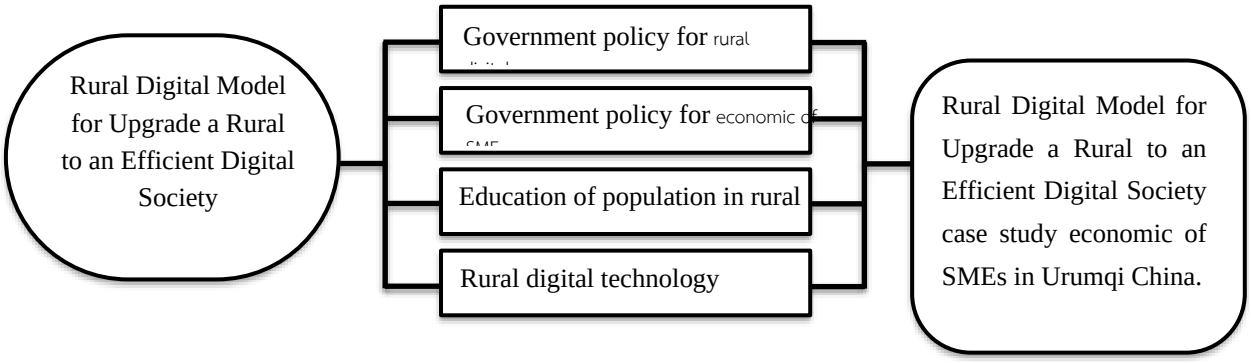

Fig.2 Digital model for rural development to upgrade the countryside to an efficient digital society.

The concept map was also extended to explore the practical implications of our research. In summary, policy implications It shows how our findings can inform policy decisions through recommendations and insights for policymakers. It shows how it can be applied in a real-world context. Finally, the concept map focuses on future research directions. It identified areas that warrant further investigation. and reveal the continuing relevance of our work. This concept map serves as a visual representation of the synthesized knowledge of our research. This helps increase clarity and understanding of our findings.

Conclusion

Upon reflecting upon the extensive data analysis in Chapter 4, which was in harmony with the collected questionnaires, we are now in a better position to elucidate our research findings:

(1) Research Objective 1: Investigating the vital components and factors underpinning the transformation of rural areas into robust digital societies.

Our detailed SPSS analysis suggests that the average wireless broadband access rate, mobile payment utilization rate, e-government service adoption, and the degree of digital education in our selected rural areas are 71.67%, 68.33%, 66%, and 65%, respectively. The correlation coefficient deduced from SPSS emphasizes a substantial positive relationship between these metrics and the digitalization of rural areas.

For instance, Area A, registering an outstanding wireless broadband access rate of 75%, serves as an exemplar, underscoring the pivotal role of digital infrastructure in spearheading rural digitalization. On the contrary, Area B, with a commendable mobile payment usage rate of 71%, faces challenges due to its diminished wireless broadband access, highlighting the symbiotic relationship of these factors in achieving holistic digital transformation.

(2) Research Objective 2: Decoding the intricate relationship between components and their impact on digital transformation in rural areas.

Upon evaluating our hypotheses, we discern robust empirical support for Hypotheses 1 and 2. This validates the overarching role of high wireless broadband access and augmented mobile payment adoption in rural digital ascension. However, Hypothesis 3 received nuanced support, reinforcing that while digital education is instrumental in fostering digital technology acceptance, auxiliary components, such as heightened community digital transformation awareness, are equally pivotal.

This insight reaffirms that these elements are not insular but are intrinsically connected, thereby accentuating the need for a comprehensive strategy encompassing every facet, ranging from infrastructural to community cognizance.

(3) Research Objective 3: Architecting a pragmatic rural digitalization blueprint aimed at elevating rural societies into digital powerhouses.

Enlightened by the previous analyses, we unveil a coherent rural digitalization model. This framework accentuates the indispensability of infrastructural facets like wireless broadband access and grassroots digital innovation, paired with the application milieu, encapsulating aspects like mobile payment proliferation, the ubiquity of e-governance services, and digital literacy.

Furthermore, our model furnishes a diversified strategy addressing the multifarious challenges pinpointed in our discourse. This entails magnifying wireless broadband infrastructure, amplifying mobile payment and e–Government adoption, nurturing digital literacy, cultivating grassroots digital innovation aptitude, and proliferating community cognizance regarding digital metamorphosis.

In summation, our exploration underscores the imperative of an all–encompassing strategy, entailing both infrastructural and operational dimensions, to usher in a robust digital era in rural landscapes. Our delineated rural digitalization framework offers a comprehensive roadmap, which if judiciously implemented, holds the promise of a monumental digital renaissance in these territories.

Suggestions

Based on our research findings and discussions, we offer the following recommendations:

1. Suggestions for future research methodologies

The quantitative analysis method we employed has provided an in–depth understanding of rural digitalization. However, future research may need to adopt qualitative research methods, such as in–depth interviews and case studies, to gain a more comprehensive and meticulous understanding. For example, in–depth interviews could help researchers better understand the attitudes and expectations of rural community members towards digitalization, while case studies could offer practical implementation strategies and outcomes.

2. Suggestions for new issues that need exploration in the future

Our research discovered the critical impact of the availability of e–governance services in the process of rural digitalization. Yet, we need to understand more deeply why the availability of e–governance services is so crucial and how to promote e–governance services more effectively. Moreover, we need to explore other potential key factors, such as how the socio–economic conditions and cultural background of rural communities affect their digitalization process.

3. Suggestions for practical applications

Our rural digitalization model can provide guidance for policymakers and practitioners. Firstly, they need to pay attention to the digital infrastructure construction in rural areas, especially improving the wireless broadband access rate. Secondly, they need to promote mobile payments and e–governance services so that rural community members can access and use digital services more conveniently. Lastly, they need to enhance the level of digital education in rural areas to improve the digital skills and knowledge of rural community members.

Overall, our research provides valuable insights into understanding and promoting rural digitalization. We anticipate that future research will further develop this field, and we look forward to seeing our research results applied in practice.

References

Chen, N., Bai, L., He, Y., Li, M., & Liu, S. (2022). Analysis and Thinking on the working mode of rural standardization in digital agriculture. Standardization in China, 5.

Di, J., & Ren, Y. (2022). Digitization boosts rural industrial economic development. Economic Research Guide, 3.

Liang, B., Lv, X., Wang, D., Wang, L., Zhang, Z., Hou, T., & Lei, T. X. (2020). Discussion on rural development trend of large-scale digital agriculture A case study of Xinjiang Production and Construction Corps. Agricultural Economics, 3.

Liu, Y. (2022). Effect evaluation and mechanism Research of Rural digitization to improve farmers' living standards. Guizhou Social Sciences, 9.

Liu, M., & Sun, Y. Y. (2020). Further promoting the new path of rural digital economy development. Productivity Research, 6.

Ning, Y. (2022). Practical achievements, problems and governance paths of rural digital e[6] Wen, T., & Chen, Y. M. (2020). Integrated development of digital economy and agricultural and rural economy: Practical model, realistic obstacle and breakthrough path. Issues of Agricultural Economy, 12.conomy development. Agricultural Economics, 3.

Wongkumchai, T., Ayuthaya, S. D. N., & Kiattisin, S. (2020). The Consistency of the Sufficiency Economy Philosophy (SEP) with Sustainable Development Goals (SDGs). Journal of Mobile Multimedia, 16(4), 413–448.

Wongkumchai, T., & Kiattisin, S. (2021). Information analysis and evaluation model (IAEM) of Thai economy sustainability based on SEP and SDGs. Heliyon, 7(6), e07305.

Xiang, C. (2022). Research on the realization path of Rural Economy Digital Development. People's Forum • Academic Frontier, 3.

Xue, G., & Xiang, X. Y. (2020). Promoting the development of agricultural and rural digital economy by the construction of rural informatization infrastructure. Agricultural Economics, 3.

Xie, Q., & Chen, S. (2022). Challenges and Solutions to the digital transformation of rural public services in Central and Western China. Electronic Government, 14.

Xie, L. (2020). Analysis on Innovation mode of rural digital inclusive finance under the development of rural digital agriculture. Agricultural Economics, 3.

Zhang, M. (2022). Analysis on the promotion strategy of digital transformation in agriculture and rural areas. Rural Economy and Science and Technology, 3.

Zou, H. (2022). The dilemma and solution of rural digital economy development. Agricultural Economy, 2, 46–47.

Zhong, Y. (2020). Thinking and practice of digital transformation of rural financial services. China Rural Finance, 2.