

A Self-Determination Perspective of Digital Inclusion: A Case Study of Bridging the Digital Divide in Rural China

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ABSTRACT

Digital inclusion (DI) is acknowledged not just as a foundation for economic advancement, but also as a noteworthy catalyst for societal development. This will lead to the reduction of the digital gap. Nevertheless, the pursuit of achieving DI has not undergone substantial scholarly examination. Through an in-depth analysis of the highly successful TaoBao Village in rural China, we propose a procedural framework illustrating the evolution of digital inclusion. This investigation highlights that the realization of digital inclusion relies on a self-determination mechanism, progressing through three distinct phases. Each phase, in turn, consists of three steps: Establishing motivational drivers, facilitating IS capabilities and extend of digital inclusion. Thus, this article constructs and presents a comprehensive process model of digital inclusion that vividly portrays the implementation of these three pivotal steps to bridge the digital divide.

KEYWORDS

Case Study, Digital Divide, Digital Inclusion, Self-determination Theory, Social Implications

1. INTRODUCTION

Digital inclusion (DI) is the process of overcoming traditional digital divides, moving “from gaining access to Information and Communication Technologies (ICT) to what people are actually able to do and achieve with ICT, including economic growth and equal social participation” (Andrade and Doolin 2016, p. 405). Despite the increasing pervasiveness of ICT, a widening digital divide persists across different countries and communities. As suggested by the nature of the Matthew effect, or accumulated advantage, marginalized communities may not benefit from rapid technological advancements (Ayanso et al. 2014; Hill et al. 2015). This suggests that without equitable access to leading-edge technologies, the advancement of ICTs exacerbates the challenges for disadvantaged groups to keep pace with the growth rates of more privileged groups (Cruz-Jesus et al. 2012). For example, in the Bay Area of the United States, self-driving vehicles have been deployed within a sharing economy platform

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(Harris 2015), while the internet user ratio has only reached 7% in a substantial number of African countries (Neuliep 2017). Thus, DI plays a critical role in bridging the digital divide because it not only disrupts the pattern of uneven resource distribution and imbalanced economic growth but also holds vast potential to generate benefits and tackle social challenges.

To date, numerous real-world examples have demonstrated the economic benefits and positive social changes enabled by DI. For instance, ICTs assist refugees in New Zealand in integrating into society by providing access to technology, fostering participation, and creating job opportunities, thus empowering disadvantaged groups and enhancing their control over their futures (Hund et al. 2021; Xie et al. 2022). Therefore, DI serves not only as a means to mitigate the economic divide but also as an aid in helping disadvantaged communities enhance their social standing (Khalid Anser et al. 2021). Moreover, scholars have posited that it is not only about the adequate distribution of resources but also about equitable participation in the shaping of social life (Al-Qirim et al. 2022; Li et al. 2022). In other words, the transformation of communities from exclusion to inclusion must be reflected in both the economic and social realms, embodying the principles of DI (Helsper 2008; Salinas and Sánchez 2009).

Despite the apparent benefits of DI and its importance in contemporary society, our literature review, which will be presented in a later section, suggests that current understanding of the DI process is limited, thereby hindering our ability to fully utilize it (Qureshi et al. 2021). This knowledge deficiency arises from several gaps identified in the existing literature. First, while there is a collection of studies on DI, most are primarily variance studies (Buré 2006; Hatlevik and Christophersen 2013; Jaeger et al. 2012; Kohli and Melville 2019). These studies have contributed valuable insights for the development of the DI concept, yet there is a need for more in-depth investigations into the process through which DI evolves. This research is crucial for structuring the key factors identified in the literature into a process theory, which sequences them to examine how and in which order DI unfolds. Second, and moving the research objective to an earlier stage, the underlying mechanisms by which ICT promotes economic and social development are not fully explored. This is crucial because increased use of ICT does not automatically lead to individuals feeling more economically and socially included (Crump and McIlroy 2003; Hund et al. 2021; Madon et al. 2009). In essence, DI is more concerned with self-determination, emphasizing that it is an action “done by people rather than to them.” (Andrade and Doolin 2016, p. 406)

Utilizing a case study from Shaji Taobao Village, an agricultural community in a remote area of rural China that has transformed into a dynamic e-commerce hub, the conceptualized process model illustrates how DI has spurred economic growth and enhanced the social participation of the local communities. The aim of this study is to address the aforementioned gaps in several ways. First, in response to the scarcity of process-centric research on DI, one objective of this study is to propose an empirically grounded process model that describes the development of DI. Additionally, by examining the case of DI in Shaji Village from a self-determination perspective, this study sheds light on how a community that is inherently marginalized can utilize ICT to achieve DI. Accordingly, this research seeks to answer the question: How do rural communities achieve DI through self-determination?

The study is structured as follows: Section 2 discusses the current research on DI and self-determination theory (SDT) by identifying research gaps and justifying the rationale for selecting SDT to analyze this significant phenomenon. In Section 3, we detail the research design, including case selection, data collection, and analysis processes, setting the foundation for an in-depth exploration of DI and SDT. Section 4 presents our comprehensive analysis, revealing the entire process by which rural communities achieve DI through SDT. Finally, Section 5 summarizes the theoretical and practical implications that serve to bridge the digital divide in rural China.

2. LITERATURE REVIEW

2.1 Digital Inclusion for Social Change

As an illustrative example, DI typically refers to a community's transition from living in poverty and being excluded from social life to being able to fully participate in economic growth and societal development through ICT, eventually gaining the ability to make their own decisions (Fichman et al. 2014). This concept is based on the phenomenon of digital exclusion, which describes situations where marginalized communities may not have equal participation in society and remain excluded from economic growth (Steininger 2019; Warren 2007). Furthermore, DI requires a shift so that when communities overcome digital divides, they move from merely accessing advanced technologies to applying these technologies in practice and subsequently creating relevant applications.

DI encompasses two aspects: fostering economic growth and enhancing community social participation (Abubakre et al. 2021; Helsper 2008; Kraus et al. 2019; Salinas and Sánchez 2009), which occurs sequentially. However, some studies have ignored DI's social impact (Clayton and Macdonald 2013; Friemel 2016; White and Selwyn 2013), focusing solely on economic growth to bridge the digital divide. Yet, this divide can impede full social engagement and decision-making autonomy. Therefore, enhancing communities' political involvement, cultural identity, and social connections is vital for true inclusion (Andrade and Doolin 2016; Huggins and Izushi 2002; Mervyn et al. 2014).

DI develops in two phases: initially, economic growth through resource distribution and investment drives digital inclusion, as it enables communities to access advanced technologies, and it is often spurred by external factors like government policies or incentives (Dasgupta et al. 2005; Graham 2002; Mergel 2016). The subsequent stage of DI is to enhance the social participation of communities. Marginalized communities generally seek ways to feel more socially included (Buré 2006; Newman et al. 2010). This is evidenced by reinvesting in society after attaining wealth (Bélanger and Carter 2009; Cullen 2001; Fichman et al. 2014), a willingness to participate in social events to determine their own destinies (Qureshi et al. 2017; Warschauer 2003; Warschauer 2004), and being proactive in addressing social issues and creating opportunities (Kraus et al. 2019; Norris 2001; Van Dijk 2006).

2.1.1 Existing Knowledge Gaps in Digital Inclusion for Social Change

Our review of the literature on DI has revealed two research gaps in the existing body of work. First, although DI is a well-known topic with a substantial research base from both societal and academic standpoints, the majority of existing studies are variance-based studies (Markus and Robey 1988) that focus on identifying the critical success factors (CSFs) of DI. The CSFs identified in the literature include incentive regulation for economic dimensions (Greenstein et al. 1995), effective participation in an information society (Lin and Ma 2022; Livingstone and Helsper 2007), ICT-based resource orchestration and relocation (Cui et al. 2019; Helsper 2008), and economic and social connections through community reciprocity (Abubakre et al. 2021), along with a strong mastery orientation implemented through educational initiatives (Chan et al. 2019; Hatlevik and Christophersen 2013). Despite the academic and practical contributions of these studies, we found a paucity of research related to the process of developing DI. Understanding this process is crucial not only to explain how the various CSFs facilitate DI but also to potentially refine how CSFs are applied (Tan et al. 2010).

Secondly, much of the existing literature tends to focus only on how CSFs facilitate the alleviation of exclusion but overlooks the underlying mechanisms of DI. More significantly, the role of ICT in achieving DI remains obscure (Brazo et al. 2022; Fichman et al. 2014). DI is posited by many scholars to focus on empowering marginalized communities (Bleumers et al. 2012; Hatlevik and Christophersen 2013), emphasizing DI as "something done by the people rather than to them" (Taket et al. 2009, p.133). In other words, DI is more about actions underpinned by self-determination rather than by external interventions (Warschauer 2004). However, few studies have directly examined DI achievement from this perspective. Our case study aims to address this gap in understanding.

To address the identified gaps, we employ SDT as a theoretical framework to gain insights into DI for two primary reasons. First, we have chosen a theory that is conducive to constructing a process model under a complex cultural context. Through a comparative analysis of existing research addressing societal-level issues, we have observed the widespread adoption of IT affordance (Tim et al. 2021), resource orchestration (Cui et al. 2017), and the theory of emergence (Yezdani et al. 2015) in exploring process models within the same research domain. The perspectives presented emphasize ICT's crucial role as a change catalyst. However, they often overlook the critical changes driven by community member interactions in DI processes. Second, we seek a theory that explains how communities can achieve economic growth and better social participation. Existing theories fall short in connecting the progression from economic growth to improved community participation. As suggested by LaChapelle et al. (2005), the concept of self-determination is pivotal in empowering disadvantaged groups to foster economic growth and engage in social life. Therefore, the literature surrounding this concept aligns particularly well with our exploration of DI.

2.2 Self-Determination Theory

Self-determination theory (SDT) “provides empirically informed guidelines and principles for motivating people to explore experiences and events and, from that reflective basis, to make adaptive changes in goals, behaviors, and relationships” (Ryan and Deci 2008, p.186). Self-determination is a process that focuses on motivations transitioning from external to internal to eventually achieve optimal functioning and develop social-contextual conditions (Deci and Ryan 2008; Deci and Ryan 2010; Gagné and Deci 2005).

The core of SDT is derived from the psychological process known as motivation. Motivation is the transformation from a need to positive behavior and action (Hocine and Zhang 2014). SDT represents a broad framework for understanding motivated behaviors and enhances comprehension of autonomy, competence, and relatedness (Ryan and Deci 2006), which are defined as the three basic psychological needs (Niemic and Ryan 2009). Autonomy emphasizes that the experience of behavior is volitional (Deci 2002) and can be described as the initiator of one's own behaviors (Ryan and Deci 2016). Autonomy often refers to the process of gaining self-efficacy (Deci and Ryan 2002), which prompts a change in perception that transforms into new action (Adams et al. 2017). Competence in SDT is typically found to depict the necessity of certain abilities to promote change (Greguras and Diefendorff 2009). More importantly, the satisfaction of both autonomy and competence is key to achieving sustainable motivation and enhancing the quality and effectiveness of new actions (Niemic and Ryan 2009). Self-motivation is considered the most significant factor for people to become proactive and is consequently important when pursuing goals (Gagné and Deci 2005). Existing studies on SDT have examined two main types of motivation: intrinsic and extrinsic.

Intrinsic motivation is human behaviors driven by internal rewards (Ryan and Deci 2000b). In other words, this suggests, “you do something because you enjoy it and find it interesting” (Hagger and Chatzisarantis 2007, p.128). Most research on intrinsic motivation has focused on issues of competence, self-reward, self-reflection, and relative capabilities (Grant 2008). To facilitate intrinsic motivation, individuals must establish self-regulation as supported by self-reward mechanisms and competences that effectively improve productivity, as well as sufficient and sophisticated capabilities (Markland et al. 2005; Roca and Gagné 2008). These factors are gained through an in-depth awareness of social context and conditions and will be applied when coping with existing issues for new proactive behaviors (Amorose and Anderson-Butcher 2007; Vansteenkiste et al. 2009).

Extrinsic motivation is defined as behavior driven by external rewards, such as money, fame, and valuable resources (Vansteenkiste et al. 2006). More importantly, extrinsic motivation is developed by external, introjected, identified, and integrated regulations, which are driven by mechanisms of external reward (Ryan and Deci 2008). That is, the process of establishing extrinsic motivation is to facilitate external regulations (Vallerand 1997). Existing research stresses that the formation of

extrinsic motivations is associated with external changes and its development is triggered by anxiety and curiosity (Perogramvros and Schwartz 2012; Ryan and Deci 2008).

We use SDT to address gaps in DI literature and the misconception that more ICT use automatically leads to better DI outcomes. SDT focuses on internalizing motivation to drive economic growth and natural participation in social movements, essential for bridging research gaps and tackling societal challenges.

3. RESEARCH DESIGN

A case study research method is adopted for the proposed study for several reasons. First, case study research is particularly well-suited to address “how”-type research questions (Gephart 2004; Walsham 2006), which apply to this research that delves into the process through which DI is developed. Second, case study research is highly suitable for exploratory studies (Eisenhardt 1991; Siggelkow 2007; Trappey et al. 2022), which is appropriate for this work since DI is an important phenomenon with an unclear underlying mechanism.

3.1 Case Selection

To address the proposed research questions of this study, we selected a case study that fulfills two criteria. First, the case must have achieved a significant measure of DI success, as the study is aimed at developing a process theory for practitioners. Second, in alignment with the researchers’ focus on self-determination, the emergence of Taobao Village—where at least 10% of the rural community’s households must operate an online shop with annual online transactions exceeding USD 1.64 million—is entirely supported by the Taobao platform (Yue et al. 2015). This case illustrates how rural community members can enhance their own capabilities with the aid of ICT.

Shaji is home to an industry that has specialized in ready-to-assemble furniture for the past decade. It has become one of the wealthiest villages in Jiangsu province, largely due to the introduction of Taobao, a business-to-consumer (B2C) and consumer-to-consumer (C2C) platform owned by Alibaba and recognized as the world’s largest e-commerce marketplace. The success of this village is extraordinary. Currently, there are over 163,000 online stores in the community, generating a total revenue of USD 252 million in 2019. The Taobao platform has empowered villagers to self-determine their manufacturing capabilities and expand their market reach throughout China. It has motivated the marginalized community to establish a successful e-commerce ecosystem that continues to evolve and significantly impact economic growth and societal development.

3.2 Data Collection

Data collection comprised two stages: secondary data collection and on-site interview collection. The initial round of data collection was completed in 2015, and the subsequent round in 2023. Before on-site data collection, secondary data was collected and analyzed from various sources, including participation as the main discussant at annual Taobao Village conferences. With over a decade of rapid development, the topic has not only inspired many to consider e-commerce careers but has also attracted significant interest from academia and government. Consequently, the data sources obtained are comprehensive, and the high quality of the secondary data has greatly enhanced the efficiency and integrity of the data collection process.

Interviews served as the primary method of data collection during field visits (Myers and Newman 2007), with Shaji’s local governments aiding in the recruitment of informants based on preliminary discussions. Informants were identified through snowball sampling (Biernacki and Waldorf 1981), resulting in 100 interviews with e-merchants, their employees, government officials, e-commerce association leaders, and customers. Each interview lasted about 90 minutes and was recorded and transcribed to ensure accuracy (Walsham 1995). Table 1 outlines the methods employed for collecting both secondary and on-site data.

Table 1. Data inventory

Data Source	Quantity	Interview Outline
Secondary data collection		
Conferences	Eight Conferences	Eight China Taobao Village Summit conferences (participated as one of the main discussants): 2014, Lishui Zhejiang 2015, Lishui, Zhejiang 2016, Shuyang, Jiangsu 2017, Heze, Shandong 2018, Suining, Jiangsu 2019, Huimin, Shandong 2020, Suning, Hebei 2021, Huimin, Shandong
Websites	24 articles & reviews	<ul style="list-style-type: none"> ● 10 articles on aliresearch.com from Alibaba reports ● 2 reviews on worldbank.org from “East Asia & Pacific on the Rise” ● 12 reviews on alizilia.com from “News from Alibaba”
Onsite data collection		
Public Servant	10 interviews & two presentations	<ul style="list-style-type: none"> ● Representatives’ presentation by local government ● Face-to-face interview
E-merchants (online shop owner)	20 interviews & five demonstrations	<ul style="list-style-type: none"> ● Demonstrations of online shop web pages ● Visiting local e-commerce factories ● Face-to-face interview
Employees of local online shops and their relatives	40 interviews	<ul style="list-style-type: none"> ● Visiting customer services teams of 20 online shops and conducting face-to-face interviews ● Experiencing the product and conducting face-to-face interviews
Third-party services provider	10 interviews & six presentations	<ul style="list-style-type: none"> ● Presentation from the representatives of six leading services providers ● Visiting outsourcing marketing companies and conducting face-to-face interviews
E-commerce association leaders	15 interviews	<ul style="list-style-type: none"> ● Attending the training courses and conducting face-to-face interviews with lecturers ● Visiting professional new product photo shoot workshop and conducting face-to-face interviews with e-merchants who work for the association
Customers	Five interviews	<ul style="list-style-type: none"> ● Demonstrating the user experience when purchasing certain products online and interviews

3.3 Data Analysis

Data analysis was conducted concurrently with data collection to fully leverage the flexibility offered by the case study method (Eisenhardt 1989). Based on a literature review of DI and the SDT framework, a set of themes and subthemes was initially identified to serve as a theoretical lens to guide data collection (Pan and Tan 2011). These themes encompassed various DI mechanisms and motivational factors that could promote self-determination. Multiple coding techniques were applied to categorize and organize the interview data, thereby expanding the theoretical lens into a fully-fledged process theory (Pan and Tan 2011).

For the initial round of data analysis, the collected data were coded using a combination of open, axial, and selective coding methods (Strauss and Corbin 1998). A systematic verification process was implemented to ensure that each finding was corroborated by at least two separate sources of evidence (Klein and Myers 1999).

For the second round of data analysis, key statements were integrated with a systematic literature review and Strauss and Corbin's concept of axial coding (Corbin and Strauss 2014) was utilized. Alongside the theoretical framework, the milestones in Shaji's transformation were documented from a marginalized rural village to a commercially successful e-commerce hub through a visual map. Additionally, the researchers crafted a narrative detailing the events, activities, and decisions that transpired. The visual map and narrative served as tools to distil the copious data into a more digestible format (Langley 1999). The iterative process between data, analysis, and theoretical development (Eisenhardt 1989) persisted until theoretical saturation was achieved (Glaser and Strauss 1967).

In the final round of data analysis, the researchers connected the themes with the findings to address the research question and ensure its resolution, while also bridging the research gaps related to both the research phenomenon and theory more effectively. To enhance the validity of the data analysis, a self-reflection cycle was instituted. In accordance with the seven principles for interpretive field research (Myers 2019), both the secondary data and on-site interview data were analyzed and discussed with other research team members twice before finalizing the interpretation. The self-reflection cycle ensured that the descriptions were accurate and sought additional information to refine the conceptual model.

4. FINDINGS

The analysis showed that the development of DI at Shaji depends on self-determination mechanisms (Figure 1). The findings revealed a pattern across three stages in how self-determination is actualized. The subsequent sections delve into each development phase and align the findings with existing literature.

4.1 Phase One: Non-Self-Determination

Shaji, once an agricultural community in Jiangsu Province, faced developmental hurdles due to poor transportation and infertile soil. With no significant historical heritage to draw upon, the village struggled economically, lagging behind in gross domestic product (GDP) contributions. Although targeted poverty alleviation policies were introduced, they failed to yield substantial improvements.

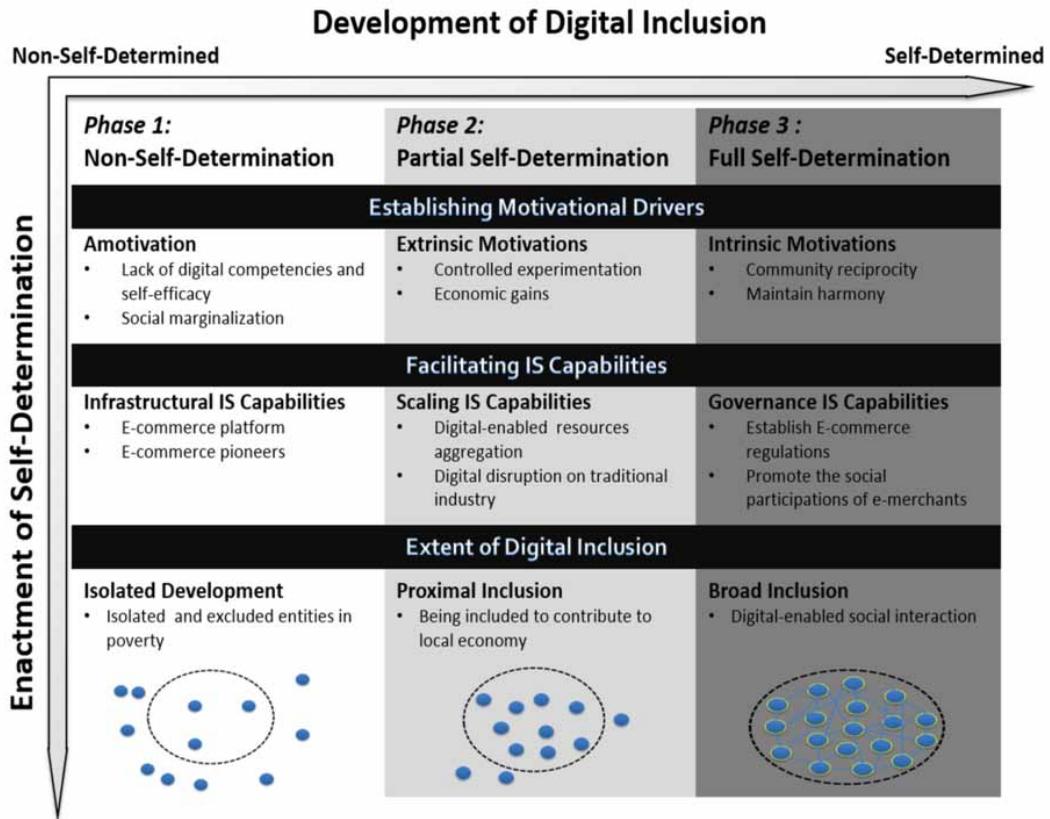
A local farmer in Shaji shared, *"Before Taobao, I attempted to start a business, but it didn't succeed. Some of my relatives never even attempted to alter their lives, believing that the digital divide was widening, and the future seemed bleak."*

Communities that are unable to effect change in their lives and are confronted with unprecedented risks reside in a state of amotivation (Vallerand et al. 1992). It is exceedingly difficult for disadvantaged groups to overcome barriers due to a lack of digital competencies (de Pablos Pons 2010) and self-efficacy (Bandura 1977), where even accessing the internet can be challenging. In contrast to the modern information society, communities suffering from amotivation experience social marginalization (Byrne and Sahay 2007). They are unable to manage their own lives and, consequently, are not economically or socially acknowledged by society (Warschauer 2004). Table 2 illustrates how a non-self-determined community establishes motivational drivers (amotivation).

Amotivation is then influenced by infrastructural IS capabilities, as early e-commerce pioneers benefit from the platform. Specifically, infrastructural IS capabilities contribute to bridging the digital divide and fostering local e-commerce, with pioneers actively supporting and profiting from them. In Shaji, farmers quickly recognized the advantages of DI—by merely utilizing the Taobao platform to set up a modest online store, they could earn a significant profit.

However, the outcome of facilitating infrastructural IS capabilities, represented by the extent of DI, remained limited. The community still experienced a form of isolated development; aside from the e-commerce pioneers, most local farmers continued to live in isolation and poverty. Disadvantaged groups at this phase had minimal communication with the information society (Helsper 2008) and

Figure 1. Process model for the development of digital inclusion through enactment of self-determination



contributed little to the community’s economic growth (Buré 2006). The description and evidence of how a non-self-determined community facilitates infrastructural IS capabilities are detailed in Table 3.

Yet, the status of isolated development during the non-self-determined phase prompted some community members to become conscious of the dire need to remain motivated. Being economically and socially excluded in modern society was increasingly seen as unacceptable by some. At this initial

Table 2. How a non-self-determined community established motivational drivers (amotivation)

Amotivation	Description and Evidence	
Lack of digital competencies and self-efficacy	Talent drain	<ul style="list-style-type: none"> Younger generations with good educational backgrounds will work in big cities and never come back to Shaji.
	Underestimation of their innate abilities	<ul style="list-style-type: none"> Technology development is separated from Shaji in the villagers’ perception. Some villagers cited limited Shaji resources as the reason for the failure of their business.
Social marginalisation	The huge divide between rich and poor	<ul style="list-style-type: none"> Shaji ranked lowest in GDP within the province, while Jiangsu, a highly developed province, leads in both the economy and technology in China.
	A weak voice in politics	<ul style="list-style-type: none"> While many Jiangsu province villages pursue advanced development, Shaji primarily seeks assistance to escape poverty.

Table 3. How a non-self-determined community facilitates infrastructural IS capabilities

Infrastructural IS Capabilities	Description and Evidence	
E-commerce platform	Taobao.com	<ul style="list-style-type: none"> • No. 3 world’s largest online shopping website, a subsidiary of Alibaba Group. • Achieved 521.6 million monthly active users and over a billion product listings in 2022.
	Alipay	<ul style="list-style-type: none"> • Transactions are secured by an escrow-based online payment platform. • A unique payment system ensures the benefits of both clients and e-merchants.
E-commerce pioneers	The first three young and local e-merchants	<ul style="list-style-type: none"> • Customers received orders in a very short time (normally within 3 days nationwide and 1-2 days within 1000 km) with a very low charge (1.6 USD/kg) and were impressed by the highly efficient express carriers. • They opened the first online shop and started to sell beauty accessories online, which the owner usually sold on the local night market. • One of the early e-merchants was a full-time employee at a mobile phone shop; he was inspired by his job and started to sell SIM cards online.

stage, a few community members began to access and incorporate infrastructural IS capabilities, gradually becoming valuable to digitally-included entities. Table 4 discusses the manifestations of an isolated and excluded community in two respects: economically and socially undeveloped.

Infrastructural IS capabilities have proved more effective than any poverty alleviation policies. These capabilities empower disadvantaged groups to counteract the adverse effects of the digital divide, ultimately enhancing their societal recognition. Consequently, community members have transitioned from passively accepting their plight to proactively engaging with opportunities.

4.2 Phase 2: Partial Self-Determination

Economic and social exclusion are significant obstacles to accessing advanced technologies, leading to heightened perceptions of difficulty in achieving digital inclusion and recognition. For example, many seniors may resist using apps like WhatsApp, but as they overcome initial hesitations, their confidence grows, serving as a catalyst for empowerment in addressing digital challenges.

Table 4. How a non-self-determined community presents itself as an “isolated development” to the first extent of digital inclusion

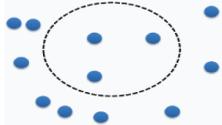
Isolated Development	Description and Evidence	
Isolated and excluded entities in poverty 	Economically undeveloped	Only a handful of villagers have recognized the advantages of E-commerce and the Taobao online platform; the majority remain unaware that a potential solution exists to improve their current living standards.
	Socially undeveloped	There is no social connection among villagers regardless of their living standards.

Table 5. How a partial-self-determined community establishes motivational drivers (extrinsic motivations)

Extrinsic Motivations	Description and Evidence	
Controlled Experimentation	Small scale experiment	<ul style="list-style-type: none"> • Villagers began online businesses selling mobile phone accessories, previously only available at local markets, with no opportunity cost or conflicts between online and offline markets. • With no local logistics company in Shaji, e-merchants brought parcels to the town centre during their commutes, without incurring extra costs.
	Low risk experiment	<ul style="list-style-type: none"> • Villagers who first joined the Taobao platform only paid 160 USD in membership fees for e-merchant registration, and there is no further payment required by Taobao. • Online transactions are secured by the third-party payment platform; the benefits of the e-merchant are protected.
Economic Gains	Living standards improved	<ul style="list-style-type: none"> • Villagers who have participated in E-commerce received the benefits to significantly enhance their living condition.
	Value chain established	<ul style="list-style-type: none"> • E-merchants began to explore ways to expand their businesses by establishing the value chain proposition.

The extent of DI in the initial phase catalyzed the onset of Shaji’s subsequent development stage. E-commerce pioneers recognized the villagers’ technological disadvantages, their exclusion from the information society, and the uneven distribution of business development resources (Chang et al. 2023; Li et al. 2022). This awareness deepened as people observed significant changes externally.

“I decided to explore major Chinese cities for promising business concepts. I realized my knowledge and skills were behind those of my university classmate living in Shanghai, who also ran a Taobao shop and earned more than twice my income,” shared Han, a successful e-merchant who visited IKEA in Shanghai with keen curiosity. There, he recognized the potential of ready-to-assemble furniture to expand his Taobao business.

Extrinsic motivation is identified when external rewards become apparent, such as capital, fame, and valuable resources. Extrinsic motivations vary in their degree of autonomy (Ryan and Deci 2000a), but their emergence is solely associated with external changes and developments (Perogamvros and Schwartz 2012; Ryan and Deci 2008). Hence, values that are readily attainable will attract attention and persuade the excluded individuals to adopt new behaviors.

Controlled experimentation is the ease of starting and maintaining a small e-commerce business, ensuring that neither the establishment nor the upkeep poses significant barriers (Arhipova et al. 2022). In Shaji, controlled experimentation not only mitigated investment risks but also provided prompt feedback on recent inputs. As a result, these external changes motivated and inspired the previously excluded community members to take action. The lure of immediate profits was particularly attractive to those who had endured prolonged poverty. Table 5 summarizes the descriptions and evidence supporting these observations. The conceptualization is grounded in SDT.

“The first time I saw Han after he quit his job, I thought he had lost his mind. He wanted to make furniture in our village! I laughed, but within a month, he had a factory in his backyard. Trucks were picking up packages twice a week. Anyone could be an entrepreneur. If I failed, I would lose just 1,000 RMB. I needed to take that first step. The opportunity cost was low, the risk manageable, and the future looked promising. I had to try!” said Han’s best high school mate and first business partner.

In the case of Han, economic gains also encouraged other disadvantaged groups to learn from the e-commerce pioneers. *“I saw some of my friends start their own businesses, and they became very good at it. Most of them made enough profit to rebuild their backyards and expand their warehouses.*

Table 6. How a partial-self-determined community facilitates scaling IS capabilities

Scaling IS Capabilities	Description and Evidence	
Digitally-enabled resource aggregation	Making the most use of locally-available resources	<ul style="list-style-type: none"> • Financial and material resources: <ol style="list-style-type: none"> 1. Turned many spare rooms into E-commerce workshops. 2. Computers for entertainment are now to manage online shops. • Human resources: <ol style="list-style-type: none"> 1. Housewives became the pillar in customer services team. 2. Farmers were trained to be Ecommerce factory hands. 3. The younger generation with degrees became marketing staff. 4. Villagers with the entrepreneurial spirit became e-merchants.
	Reaching professional help remotely	<ul style="list-style-type: none"> • Operations and logistics: <ol style="list-style-type: none"> 1. Relatively mature online shops outsource the operation teams. 2. The scaling e-commerce system attracted four nationwide logistic companies to open new local brunches in Shaji. • Sales and Marketing: <ol style="list-style-type: none"> 1. Experienced marketing and sales specialists in Beijing worked with local online shops by conducting weekly online meetings. 2. Consultants were hired to make pricing strategy.
Digital disruptions to traditional industries	Disruption of the furniture industry	<ul style="list-style-type: none"> • Customer behaviors became the core of business analysis. • The furniture design process was simplified based on the customer feedback provided on Taobao.com.
	Disruption of the existing E-commerce industry	<ul style="list-style-type: none"> • The unnecessary costs of branding were reduced, and more was invested to tailor the products for the special orders. • A local e-commerce alliance was established to share internal business opportunities and fend off external competitors.

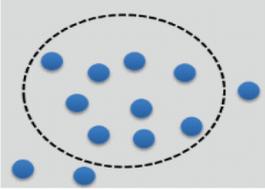
Then I told myself, I must give it a try.” said a villager who now has his own online shop with a gross income of more than half a million RMB (74,000 USD) a year.

In the conceptualized model, facilitating IS capabilities helps to scale community e-commerce operations. More specifically, with the development of e-commerce in Shaji, digitally-enabled resource aggregation capability empowers the community to reallocate ICT-related opportunities and capital. Meanwhile, the community begins to determine the digital disruptions to traditional industries, which forces new types of merchandise (easy-to-assemble furniture) to be refined, both in actual products and the relevant online customer services. Customers are increasingly particular, as they prefer to customize products, requiring breakthroughs in the traditional furniture industry, which are facilitated by IS capabilities. This is observed as scaling IS infrastructure that helps the community to easily scale their e-commerce operations, and its description and evidence are discussed in Table 6.

With the rapid development of e-commerce in the local community, the remuneration/instrumental value (Deci and Ryan 2000) of being motivated by extrinsic factors has been enacted through scaling IS capabilities, becoming a major contributor to the local economy. However, some community members have actively sought opportunities to improve their living standards, while others have been highly impacted by external developments, receiving benefits through passive compliance. Nonetheless, there are still individuals who remain excluded from both social participation and economic growth. Table 7 illustrates the second level of DI with descriptions and examples.

It seems that community members view this e-commerce development merely as a source of capital to address critical life issues. Consequently, DI is currently at the proximal inclusion stage, which is characterized by two fundamental principles: first, not all community members are actively involved in this transformative revolution, in terms of both quantity and quality. Second, economic inclusion has become the exclusive standard for measuring a member’s well-being in this information-centric society.

Table 7. How a partial-self-determined community presents itself as “proximal inclusion” to the second extent of digital inclusion

Proximal Inclusion	Description and Evidence	
Being included to contribute to local economy 	Unevenly-developed economically	<ul style="list-style-type: none"> • There was a cohort of villagers still living in poverty without making any changes. • Most of the villagers’ living standards have been dramatically increased, instead of contributing to the local economy.
	Socially disconnected	<ul style="list-style-type: none"> • There was no social connection among villagers regardless of their living standards. • Villagers with successful online businesses were still far from participating in any social life, and their voices in politics were weak. • The relationship among villagers was very vulnerable, as they are now competitors.

4.3 Phase 3: Full Self-Determination

One of the most inspiring transformations to emerge is addressing the wealth disparity within this underprivileged community. Economic growth has played a pivotal role in propelling the entire community forward, providing an increasing number of opportunities for local residents to achieve economic inclusion and gain social recognition. This new interpretation of DI has found broad acceptance among community members for two primary reasons.

First, to sustain e-commerce development and drive economic progress, a robust operational framework must be established. This framework should be rooted in the intrinsic behaviors of organizations and historical data, emphasizing the need for a community-level approach over an organizational one. Each entity must foster strong relationships and connections with its neighbors. Second, the positive impacts made by trailblazers are widely recognized within the community. Their entrepreneurial endeavors empower local community to contribute meaningfully to society, thus motivating these pioneers to use their success to create additional opportunities for independent entities. As a result, enhancing social participation becomes a paramount consideration for both pioneers and followers.

However, competition among online store owners has constrained the pace of economic expansion. This competition has mainly manifested in pricing and product offerings. For instance, when a shopper searches for a particular item on Taobao.com, identical products with identical preview photos often appear in the search results, frequently from shops located in close proximity. E-merchants commonly reduce prices to attract consumer attention and increase sales, but this intense competition can jeopardize product quality. Recognizing this issue, e-commerce pioneers and other stakeholders have acknowledged the need for a strategic shift, with economic growth emerging as the cornerstone to support the second phase of the transformation. The improvements in social participation have become the driving force for sustaining the development of the local e-commerce ecosystem, as exemplified in Table 8.

Table 8. How a fully self-determined community establishes motivational drivers (intrinsic motivations)

Intrinsic Motivations	Description and Evidence	
Community Reciprocity	Proactive behaviours	<ul style="list-style-type: none"> • Experienced e-merchants understood that building a collective e-commerce community is essential for sustained development. • Experienced e-merchants started to organize informal meetings to establish an e-commerce association.
	Compassion	<ul style="list-style-type: none"> • Some villagers chose not to partake in phase 2. However, the accomplished e-merchants were able to generate additional employment opportunities for these villagers, thereby enhancing their quality of life.
Maintain Harmony	Made allies out of enemies	<ul style="list-style-type: none"> • Homogeneous competition does not necessarily foster the growth of individual stores, so they have chosen to cooperate for mutual benefit.
	Revolution of perception	<ul style="list-style-type: none"> • Taobao's strong e-commerce setup ensures secure online transactions, supported by a collaborative effort that optimizes offline infrastructure, spreading risk and management costs across numerous online shops.

The extent of DI in the second stage encourages local farmers to take further steps in developing a robust e-commerce ecosystem. E-commerce businesses in Shaji have identified a significant challenge: they believe that a strong e-commerce ecosystem should not depend solely on a select group of pioneers or participants but should be open to contributions from all members within the ecosystem in various capacities. Therefore, the level of individual involvement affects the development of DI.

“I’m happy to see many friends and relatives becoming e-merchants or working for online shops in recent years. It’s interesting how their roles have naturally emerged. Even two of my uncles, who were initially skeptical about e-commerce, now see the potential to change their lives as they witness its growth and the changes around us,” said a female e-merchant who followed her cousin’s advice and started a business.

Following the proximal inclusion of communities, the extent of DI has resulted in the creation of intrinsic motivations for local e-merchants. Intrinsic motivations indicate that people perform a certain task because it brings them value through enjoyment and stimulation (Grant 2008). The strong sense of community reciprocity (Borgida et al. 2002) motivates e-merchants to consider giving back to society and supporting marginalized groups. This approach aims to actively involve these marginalized communities in the advancement of e-commerce. Therefore, to facilitate intrinsic motivation, people should establish self-regulation powered by self-reward mechanisms.

Furthermore, in their pursuit of e-commerce harmony, e-merchants seek to foster local economic growth. For instance, e-merchants in Shaji explore strategies to distinguish themselves from other local brands and expand their customer base.

“Imitation won’t lead us to establish a resilient e-commerce ecosystem. Our online stores must be formidable, and our products must excel to withstand external challenges to Shaji. The price war will persist until neither I nor my competitors can sustain profitability.” said a successful e-merchant who owns four Taobao online shops.

Facilitating IS capabilities appears to turn motivations into actions (Markland et al. 2005; Roca and Gagné 2008). The facilitation of IS capabilities in this phase is the governance of IS capabilities. E-merchants established e-commerce regulations to enable the right to make decisions that would affect their destinies (Andrade and Doolin 2016). Therefore, IS capabilities promote social participation to improve one’s social status. Table 9 provides descriptions and examples of how a fully self-determined community facilitates the scaling of IS capabilities.

E-merchants in Shaji are now actively participating in social life. According to the head of the E-commerce Association, *“I am now very proud of myself, not only because my Taobao shop contributes to the local economy but more importantly, I am getting involved in building a social life*

Table 9. How a fully self-determined community facilitates the scaling of IS capabilities

Governing IS Capabilities	Description and Evidence	
Establish e-commerce regulations	Build up a sophisticated cooperation mechanism	<ul style="list-style-type: none"> ● E-commerce association 1. Regular training classes were open every Saturday; new entrants could apply for the free training classes. 2. The intellectual property group was regulated by the e-commerce association to protect the benefits of e-merchants. ● Senior management team 1. The team members played the role of protecting the benefits of e-merchants by providing professional suggestions to e-merchants and legal support to workers. 2. E-merchants shared their recent concerns and suggestions to public servants and government officers seeking further help to enact special policies and attract fundings.
	Create policies and procedures to moderate the development of local e-commerce ecosystems	<ul style="list-style-type: none"> ● Intellectual property protections 1. This policy encouraged innovation in product design and brand development. 2. The protections emphasised the legal consequences of counterfeit and shoddy products. ● Cooperation agreements 1. The checklist was unified for the cooperation agreement among online shops and/or suppliers. 2. The responsibilities of each online shop/third-party provider were clarified in a cooperation mechanism.
Promote the social participation of e-merchants	Encourage local social movements	<ul style="list-style-type: none"> ● E-merchants were encouraged to participate in regular local government meetings. ● E-merchants were encouraged to collect information from workers and other e-merchants and report to local governments.
	Organize local social events	<ul style="list-style-type: none"> ● E-merchants celebrate together after the “online shopping festival” on the 11th of November every year. ● E-merchants are encouraged to share their experience and business ideas every month at a local government.

and working alongside the government. I had never imagined that one day I could become a leader who contributes to society.”

Based on Table 10, we propose that the concept of broad inclusion comes into play when marginalized groups achieve success as e-merchants, enabling digitally-enhanced social interactions. This phenomenon acknowledges their roles in bridging the digital divide (Pandey et al. 2023). E-merchants engage with one another to collaboratively advance their businesses, underpinning a more cohesive community.

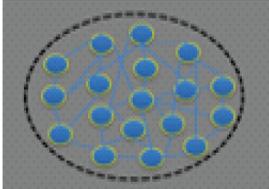
5. CRITICAL DISCUSSION

5.1 Theoretical Contribution

To address the research gaps and answer the research questions posed at the beginning of this study, the case study presented has provided a thorough understanding of DI and has depicted a conceptual process model for its achievement. Drawing upon the insights from the case study, this study explains the mechanisms by which communities can determine and enhance DI. Additionally, this study has significant implications in both theoretical and empirical spheres.

Firstly, this model advances DI research by proposing a detailed process for developing DI from a self-determination perspective, which unfolds through three stages: (1) non-self-determination, (2) partial self-determination, and (3) full self-determination. This evolution of self-determination

Table 10. How a fully self-determined community presents itself as a “broad inclusion” to the third extent of digital inclusion

Broad Inclusion	Description and Evidence	
Digitally-enabled social interactions 	Economically fully-developed	<ul style="list-style-type: none"> • There are no outliers in the mature stages of e-commerce development. • Information and resources are well-communicated among individuals. • The local economy was boosted by creating more job opportunities, and this eventually slows the brain drain.
	Socially fully-developed	<ul style="list-style-type: none"> • Villagers can communicate with local governments directly to share their opinions for e-commerce ecosystem advancement. • Policies and norms were established by villagers because their voice in politics is much stronger than before. • The relationships between villagers are very close, as they are e-commerce competitors and e-commerce companions; the development of e-commerce also promotes a cooperative system.

originates from established motivational drivers, which are then activated to foster IS capabilities. These capabilities, in return, address the motivational drivers. The level of DI acts as a critical factor in generating motivations for the next stage, considering both internal and external factors. This empowers marginalized communities to persist in adopting and applying DI principles. While previous studies have examined the key elements of motivational drivers and IS capabilities in achieving DI, this study links these concepts to demonstrate how and in what order DI is realized.

Secondly, this procedural framework expands the DI research scope by exploring the role of ICTs in sustaining economic growth and enhancing community engagement. The research model outlines a journey consisting of three distinct stages, each characterized by specific prerequisites. The transition represents the evolution of DI. As communities move from non-self-determination to self-determination, they effectively tackle social challenges and reduce the digital divide. This progression ultimately leads to increased inclusivity and improved social connections, fostering active engagement in digital social interactions.

Thirdly, this study broadens DI research by highlighting its importance for economic and social advancement. This study underscores that DI is not only a cornerstone of economic development but also a key contributor to societal progress. When both aspects are addressed, the digital divide is narrowed. This research found that DI is achieved through self-determination,

underscoring that it is an act of the people rather than an act upon them. This lays the groundwork for helping marginalized groups understand their desires, identify their needs, and take actions toward economic and social inclusion. This eventually contributes to the global information management especially for the rural areas.

5.2 Practical Contribution

This research offers several critical guidelines for local authorities and seasoned practitioners to assist local farmers in creating their own e-commerce ecosystems by providing both economic and community support.

First, it will facilitate the economic transition and ultimately enable the disadvantaged to build their self-efficacy and confidence. DI will be realized with the development of the local economy and social inclusion. Secondly, the proposed process model is as precise as a step-by-step guide, emphasizing the importance of specific IS resources and IS capabilities at each stage, and also clarifies the responsibilities that each stakeholder should consider. Ideally, practitioners and governments will maximize the efforts and resources dedicated to achieving DI.

5.3 Limitations

Future research will aim to improve this model by integrating more empirical data, not only from Shaji but also from other rural communities, and from scenarios where DI has been or can be observed. The limitations of the model will also be scrutinized through ongoing literature reviews and the execution of further case studies. By gathering and meticulously analyzing additional data, efforts will be made to refine the process model to gain a more extensive comprehension of the development, application, and social effects of DI.

COMPETING INTERESTS

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