An Information Processing Perspective of Digital Social Innovation: Insights from China's Taobao Villages

Research-in-Progress

Felix Ter Chian Tan
UNSW Business School
Sydney, Australia
f.tan@unsw.edu.au

Shan L. Pan[1]
UNSW Business School
Sydney, Australia
shan.pan@unsw.edu.au

Lili Cui[2]
Shanghai University of Finance & Economics
Shanghai, China
cui.lili@mail.shufe.edu.cn

Abstract

Digital social innovation describes new IT-enabled solutions that simultaneously meet a social need and enhance capacity to act. It is an emergent stream of social innovation research and a response to growing social, environmental and demographic challenges. Despite its importance, academic literature is still undeveloped, with ill-defined theoretical boundaries and no coherent knowledge. To address this gap, this study examines how information processing capabilities enable digital social innovation. We conduct an empirical case study on Qing Yan Liu, China's leading Taobao e-commerce village, an emerging digital social innovation and economic phenomenon in China. From interview data collected from netrepreneurs, we construct a research model that posits information literacy, information immediacy and information liberty, as the required information processing capabilities to achieve digital social innovation. The model represents the first step to better understanding the interrelationships between digital social innovation, netrepreneurs, social enterprise and social entrepreneurship.

Keywords: Digital social innovation, netrepreneurs, Taobao villages, case study, and information processing

[1] The 2nd author was affiliated to the National University of Singapore in this research.

[2] Corresponding author of this paper.

Introduction

Social Innovation is an increasingly important phenomenon and a response to growing social, environmental and demographic challenges, providing the ideal vehicle for creating and understanding social change (Caulier-Grice et al. 2012; Mulgan 2006; Phills et al. 2008). The role of ICT and social innovation are intimately connected and an emergent stream of work. In 2013, a web-based platform funded by the European Union — *Digital Social Innovation* — was commissioned to build a living map of social innovators (currently 393 organizations are listed) that use digital technologies for social innovation across Europe. Another platform is Nominet Trust, UK's leading social technology funder which features 100 global social innovations using digital technology. Correspondingly, there has been increasing number of academic literature discussing the effect of digital platforms (see Bakos and Katsamakas 2008; Gawer 2009; Hagiu 2014) and the influence of entrepreneurs on the possibilities of social innovation (see Agarwal et al. 2008; Avgerou and Li 2013; Avgerou et al. 2011).

Whilst academic literature in the area is building rapidly, social innovation is predominantly practitioner-led, still largely contextual and as such developed with ill-defined boundaries, meaning and definitions (Caulier-Grice et al. 2012; Nicholls and Murdock 2011). Although ICT to empower the socially and economically deficit groups and marginalized communities has been established in ICT4D literature (Avgerou 2008; Avgerou et al. 2001; Njihia et al. 2013), the individual mechanisms of how ICT empower users are normally subsumed within group and organizational level research. Accordingly, social innovation is not native to the IS discipline and work till this stage is underdeveloped (see Avgerou and Li 2013; Mohan et al. 2013). Researchers have called for more research into understanding individual mechanisms over group mechanisms (Walsham and Sahay 2006) to fill this research gap. Information processing theory allows the examination of the information needs and capabilities and the fit between the two to obtain desired outcomes (Premkumar et al. 2005). Addressing how information is gathered, synthesized and distributed answer calls for researchers to pay attention to how developing capabilities and access to resources empowers marginalized individuals and communities (Gerometta et al. 2005; Moulaert et al. 2005). To this end, individual case studies have not yet provided widely acknowledged theoretical *models* or sufficient practical insights for practitioners. Furthermore, there is little theory on how to rapidly mobilize such initiatives (Mulgan 2006). Without consensus or coherent scholarly body of knowledge about the practice of social innovation, this makes it harder to see the main gaps in current provision of funding, advice and support in technology for social innovation (Caulier-Grice et al. 2012; Mulgan 2006). The implication of information processing can inform coping with uncertainty and improve decision making as information asymmetries affect the diffusion of social innovation(Caulier-Grice et al. 2012; Granovetter 2005; Lettice and Parekh 2010). Hence, there are compelling reasons for research into pathways to digital social innovation, and for developing more rigor and substantive concepts in understanding social innovation and the role of information technology and systems (IS/IT).

Against this backdrop, the overarching research question for our study is: *how information processing capabilities enable digital social innovation?* To address this question, our research will examine a digital social innovation and a rapidly emerging economic trend in China–*Taobao (e-commerce) villages*. This multidisciplinary and multiple case study design will use information processing theory (Galbraith 1974; Tushman and Nadler 1978) as a preliminary guiding lens to examine the information processing capabilities in a social innovation context–*Taobao villages*–to examine its effect on alleviating social and economic impediments. Our study focuses on the mechanisms of social innovation change, its underlying sequence of events and interactions between relevant institutions as they evolve, including how the parent social enterprise– Alibaba– delivers social and economic empowerment in villages. We conducted 103 interviews with officials, Chinese netrepreneurs and villagers–in *four* remote villages in rural China. This article presents preliminary findings from the case investigation of Qing Yan Liu village. Preliminary findings show that social innovation is less serendipitous (than general innovation) and must be developed to achieve its intended objectives. We will present a preliminary process model of how information processing capabilities enable digital social innovation, our ongoing analysis and implications of future work.

Digital Social Innovation and Netrepreneurs

Digital social innovations in this study refers to new IT-enabled solutions that simultaneously meet a social need (more effectively than existing solution) and lead to new or improved capabilities and relationships and better use of assets and resources (i.e. enhance capacity to act). This definition is derived from Caulier-Grice et al. (2012) and has the following characteristics: (1) social innovation is path-dependent and contextual. Working definitions highlight that it consists of three dimensions: content, process and empowerment (Gerometta et al. 2005; Moulaert et al. 2005). *Content* dimension describes the satisfaction of basic human needs within societies and communities. *Process* dimension describes changes in social relations especially with regard to governance and level of participation. *Empowerment* dimension describes an increase in the socio-political capability and access to resources needed to enhance satisfaction of human needs and participation. (2) Social innovation and technology change are invariably linked; recognizing that social innovations are increasingly building on the knowledge and skills of professionals and day-to-day practices of sub-cultures. Henceforth, the definition celebrates the use of IT tools and networks to achieve those objectives, focusing primarily on the IT artifact to address complex social challenges. Lastly, and although not directly related, (3) social entrepreneurship and social enterprise are means to the end of social innovation. Social entrepreneurship research focuses on the personal qualities of people who start new organizations, and it celebrates traits like resourcefulness, drive, tenacity, braveness and unreasonableness of entrepreneurs (Dees 1998; Mair et al. 2006; Short et al. 2009). Social enterprises on the other hand, focus on organizations and the nature of the enterprise, its management, its commercial activities and operational support etc. to social innovation (Defourny and Nyssens 2008; Harding 2004). Whilst their convergence is useful, it is often important for researchers to understand the divergence between these terms to position their work (Defourny and Nyssens 2010). A recent concept that overlaps both terms are "*Netrepreneurs*": entrepreneurs who apply innovation to create online business, viewing social challenges as business opportunities (Avgerou et al. 2011; Jiwa et al. 2004; Lowery et al. 1998).

The definition of digital social innovation builds on robust discussions on social innovation descriptions. In 2003, the Stanford Social Innovation Review journal first defined social innovation as "*the process of inventing, securing support for, and implementing novel solutions to social needs and problems*." In 2008, what was believed to be a more precise definition was coined in the journal: *"A novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals"* (Phills et al. 2008, p36). More recently, criticisms of the definition surfaced; declaring it too broad and focuses only on the 'product' dimension of social innovation, ignoring the important *stages* of implementation and diffusion, and urging researchers to consider the 'process' dimension (Gerometta et al. 2005; Gillwald 2000). This approach should explore the governance, empowerment and capacity building dynamics (Caulier-Grice et al. 2012) and build on existing research on motivation (Harris and Albury 2009), impact (Pol and Ville 2009), attitudes and perceptions (Neumeier 2012) of social innovation. If we follow the academic literature on innovation, research on 'process' focuses on the organizational and social processes that produce innovation, such as organizational structure, environmental context and social and economic factors (Amabile 1996; Scott and Bruce 1994; Woodman et al. 1993).

An Information Processing Perspective

Information processing research posits that firms, organizations and individuals need quality information, and the capability to gather, interpret, synthesize and disseminate information properly to cope with uncertainties (e.g. in technology, demand and supply) and improve decision making (Tushman and Nadler 1978). It includes information processing need, capabilities and the fit between the two to obtain desired outcomes (Premkumar et al. 2005). A basic assumption that information processing researchers (Tushman and Nadler 1978) make is that "organizations are open social systems which must deal with uncertainty" (p.614) and interdependencies existing in a larger environment. The literature around information processing focuses on (1) developing buffers to reduce the effect of uncertainty, and (2) implementing structural mechanisms and information processing capability to enhance the information flow and thereby reduce uncertainty. According to an Huang et al. (2014), information processing *network* and *control* mechanisms are central to developing these information processing capabilities. The structure of an information processing network describes the patterns through which

communication is expedited and information is processed (Ahuja and Carley 1999). Information processing networks are dynamic network-based information processing structure which operates as a coordination mechanism (Kwon et al. 2007). Over time, continual exposure to a specific type of structure will propel individuals toward proficiency in processing information and their ability and confidence to solve problems, through ongoing learning, in a manner consistent with this structure (Turner and Makhija 2012). In other words, structures direct or adapt the behavior of individuals by facilitating the individuals' ability to obtain and derive meaning from key information related to their work. Scholarly work points to contextual factors, including networks and social support influence power and treats self-efficacy and information processing as an important sub-process of empowerment (Conger and Kanungo 1988). These views are reflected in the theoretical constructs described below.

Empowerment in a digital context occurs when the sense of cohesion and integrity has been confirmed or strengthened by a digital activity such as e-commerce. It describes the virtuous cycle of social and economic empowerment (see Mohan et al. 2013; Phills et al. 2008). Economic empowerment applies to opportunities which have risen in terms of both formal and informal sector employment and business opportunities (Scheyvens 1999; Taibi 1994). Researchers should look for evidence of lasting economic gains to a local community and its access to productive resources in an area (e.g. financial benefits by members of a community are used to improve the community). Social empowerment on the other hand, considers maintaining and/or enhancing a community's equilibrium (Scheyvens 1999). It is noteworthy that competition and disharmony over benefits are signs of disempowerment, because assuming a community consists of a homogenous, egalitarian group with shared goals is misleading. In their research on communities of netrepreneurs, Avgerou et al. (2011) found web platforms to support social relations that enable and give particular form to economic activity, and show the cultural influences and organizational structures that constitute the institutional setting for networks of netrepreneurs. They found that netrepreneurs combine web platform tools with conventional means of direct communication, such as face-to-face and telephone conversation and rely heavily on local community-based relations (Avgerou and Li 2013). On the other hand, social embeddedness suggests that economic activity needs to be understood in the context of interpersonal relations and institutions that sustain it (Uzzi 1997). *netrepreneur embeddedness,* which refers to conditions of business and social relations in and beyond the netrepreneurs' community for entrepreneurial activity, overlaps these two concepts. Efficacy refers to the level of control wielded by communities (for example supervision of neighborhood children, maintaining public order, etc.). Collective efficacy is high in cohesive communities with mutual trust and is low in communities that are not cohesive and that do not have mutual trust. In IS, efficacy focuses on individuals' abilities to competently use computers (computer self-efficacy) in determination of computer use (Compeau and Higgins 1995). Hence, we refer *netrepreneur efficacy* to competence and confidence in using IT to perform tasks like decision making, planning allocating resources etc. in a community.

In summary, we propose that the achievement of digital social innovation requires information processing capabilities through developing netrepreneur embeddedness and efficacy.

Research Method and Data Analysis

For this study, we use a case study method to address our research question, adopting a *Structured-Pragmatic-Situational* approach (Pan and Tan 2011) to the case study design (see Figure 1). The case research methodology is particularly appropriate for this study for a number of reasons. First, case research addresses 'how' research questions (Walsham 1995) whilst examining processes (Gephart 2004), and our research question delves into the process of developing digital social innovation. Second, because we established that social innovation forms an inherently complex and multi-dimensional phenomenon, an objective approach to research is difficult (Koch and Schultze 2011), making it more appropriate to examine the phenomenon by interpreting the shared understanding of the relevant stakeholders (Klein and Myers 1999), or netrepreneurs in this case. Case selection is based on a number of criterions: (1) the case must be a widely recognised digital social innovation to fulfil our examination of activities per our earlier definitions. (2) the processes of digital social innovation must be reasonably complex for underlying mechanisms to be studied, which means that information processing networks and activities are cited and (3) the case study must present opportunities for ethnographic research of netrepreneurs, to study their embeddedness and efficacy. Based on these criteria, we chose to examine *Taobao villages* – a digital social innovation phenomenon supported by the most recognised and largest C2C platforms in

Asia – as our case study. We narrow the focus of our inquiry to three pertinent themes: (1) the structure and environment of the villages, (2) the actions of netrepreneurs and those of its partners, and (3) the development of digital social innovation and social value achieved through Taobao villages. To this end, the authors conducted site visits to four Taobao Villages in Zhejiang, an eastern coastal province of China. We conducted **103** semi-structured interviews (Taylor and Bogdan 1998) with netrepreneurs, government and provincial officials, merchants and villagers in late 2013, generating over **340** pages of transcripts (refer to table 1 and 2 for breakdown of interviewees and topics).

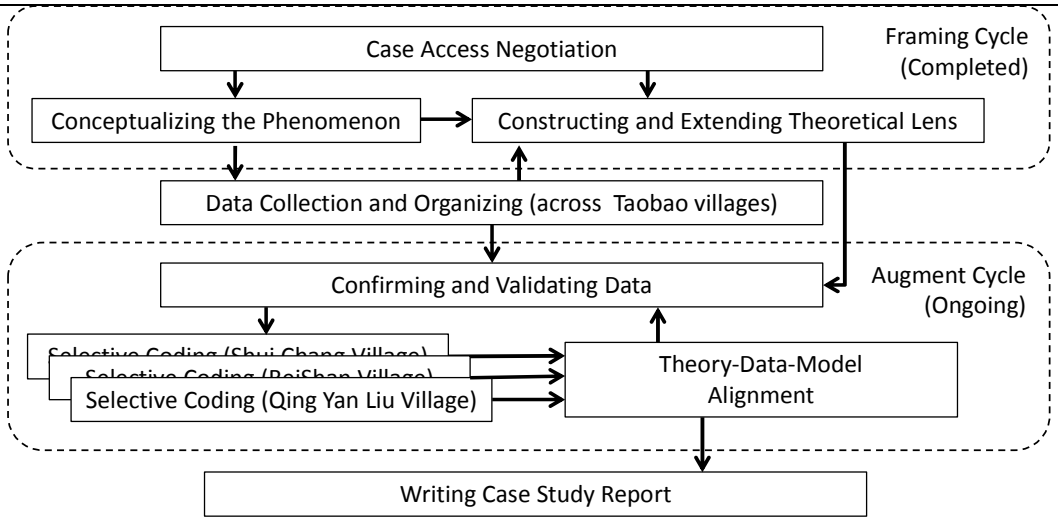

Figure 1. Structured-Pragmatic-Situational Approach to Case Study Design

We perform data analysis concurrently during data collection to take full advantage of the flexibility of the case research approach. We use our theoretical understanding of social innovation and empowerment, netrepreneur embeddedness and efficacy as a guiding lens to examine the initial data. Our approach focuses on both e-business coordination processes and coordination outcomes within a village. Moving between the empirical data, our guiding lens and the related literature exposed new patterns and allowed us to develop further mappings of the coded responses. As part of our data analysis, we adopt a combination of the *temporal bracketing*, narrative, and visual mapping strategies to organise the empirical data (Langley 1999; Langley 2009). We also drew on secondary data such as newspaper articles, books and information from Taobao's corporate website to triangulate our mappings. Moreover, the authors have been studying the development of Alibaba B2B and Taobao B2C platforms for over five years now, and published a number of articles on its complex platform structures and operations. The events timeline, our interpretive account of the events that unfold and diagrammatic representations of our theoretical ideas were verified with our informants. If our findings appeared to extend beyond the propositions of the lens, or if propositions emerged that were unsupported by our empirical data, we conducted additional interviews to build an explanation iteratively (Walsham 2006). Ongoing analysis will extract, confirm, and use pieces of evidence that illustrates the continual interplay between Taobao platform, villagers and the rural community to derive a process model (Montealegre 2002; Newman and Robey 1992) for better understanding how (Mohr 1982) digital social innovation is achieved.

Case Description: Taobao Villages

Taobao villages are a digital social innovation and a rapidly emerging economic trend in China. Taobao, also known as China's eBay, is the largest C2C e-commerce platform in China. Taobao in villages already presents a solution to overcome the mobility barriers faced by family members when ensuring a minimum amount of visiting time-a new directive in China- through sourcing social care from within their community on Taobao platform and marketplace (NominetTrust 2014). This is one way Taobao addresses social exclusion and education inequality created in part by complexities of the urban–rural divide and city migration (Wang 2012). Taobao was founded in 2003 and operated by the Alibaba group. Recently,

Taobao villages have become a unique economic phenomenon and opportunity for netrepreneurs in China (Avgerou and Li 2013; NominetTrust 2014). According to a recent Taobao Village Report (AliResearch 2012), over 1.63 million Taobao stores are registered in rural areas. By the end of 2013, the number increased another 24.9%, and the number of shops setup in villages and towns rose 76.3% compared to the end of 2012. During our site visit, we observed that all farmers reside and work in a definite locality. These ruralities demonstrate a great sense of community sentiment. Due to the limitations in (occupational and territorial) mobility of its rural population, we observe that the products (including non-agricultural products like carpentry and wooden furniture, woven baskets and perfumes) and farmers' whole mode of social life, daily routine and habits revolve around agricultural economy.

Table 1: Breakdown of Taobao Villages and Interviewees

	No of Interviewees	Netrepreneurs	Officials (government, prefecture, town and village)	Taobao representatives/ Taobao outpost
Qing Yan Liu Village	9	9	0	0
Li Shui Province	22	8	14	0
- Shui Chang Village	23	12	0	11
Song Yang Village	28	20	8	0
Bei Shan Village	21	19	2	0
Total	**103**	**68**	**24**	**11**

Table 2: Breakdown of Interviewees (Qing Yan Liu Village)

Interviewees	Title/Business	Topics Discussed
Netrepreneur 1	Mixed-goods wholesale (2002-2005). Vice president of China's Ecommerce Society (2005 onwards)	*Roots of Taobao village A,* Environment of village A, e-commerce business plan, supplier network, production strategy, Taobao as intermediary, effect of netrepreneur association, internet order fulfilment.
Netrepreneur 2	Bamboo products (2006 onwards)	Arrival at village A, e-commerce business plan, supplier network, production strategy, Taobao as intermediary, internet order fulfilment.
Netrepreneur 3	Mixed-goods wholesale (2007 onwards)	Environment of village A, e-commerce business plan, supplier network, production strategy, Taobao as intermediary, netrepreneur training, internet order fulfilment.
Netrepreneur 4 and 5	Luminous toys wholesale	Environment of village A, e-commerce business plan, supplier network, production strategy, Taobao as intermediary, effect of netrepreneur association, internet order fulfilment.
Netrepreneur 6 and 7	Wholesale- small goods	
Netrepreneur 8 and 9	Wholesale- small goods	

Process of Digital Social Innovation: Qing Yan Liu Village

In this section, we examine e-commerce activities of netrepreneurs, specifically around material orders, inventory management, product line control, shipping, payment processing and customer support (Turban and King 2011). We analyze the development of netrepreneurs' efficacy, embeddedness and information processing capabilities in these activities. Results are summarized in tables 3, 4 and 5. From case evidence collected in Qing Yan Liu village, we construct a model of how (Mohr 1982) information processing capabilities enable digital social innovation (shown in figure 2).

The first Taobao netrepreneurs arrived in Qing Yan Liu in late 2007. The first netrepreneurs were generally novice sellers. They relied on e-commerce related information and techniques from other first-time netrepreneurs and the villagers from nearby towns to source for supplies of goods they sell, whom most will eventually form a partnership with. We refer the information processing capability to *information literacy* which describes the ability to articulate information, analyze and develop knowledge of market and system tools. According to Netrepreneur 3, *"This was a small agricultural community. I started [my Taobao store] in early 2008 when there was probably a dozen people. We are led by the Deputy Director [Netrepreneur 1], we held together then it all just started [to grow]."* Villagers choose a product that is convenient to source. The platform facilitates the information sharing and techniques for

starting an online store, allowing communities to grow organically. An added advantage is the village's proximity to a large wholesale market with deep merchant roots for goods that many netrepreneurs sell. This brings convenience in sourcing, homogeneity in products and a larger and more targeted market.

Table 3. Development of Information Literacy

Axial Themes	Empirical Constructs	Representative Evidence
Development of Netrepreneur Embeddedness	Sharing information and technique	*"We form partners. Partners divide the work on getting the goods, ones who are getting the goods are also responsible for photographing and compiles the copyrighting, and then by sharing, supply chain partners can sell each other's' goods, mutually selling one another's goods."* [Netrepreneur 1]
	A partnership of online sellers	*"So through our technique sharing and information sharing (online), we will lift the credibility of the supply chain partners (in our village) on TaoBao"* [Netrepreneur 1]
Development of Netrepreneur Efficacy	Identify product and platform trends	*"We use the Taobao (platforms) to identify products to buy. There are two kinds of goods we are after. The first is the current red ticket items on the platform and the second is red ticket items of the future for example "chongdianbao" or portable chargers for small devices back in 2010"* [Netrepreneur 2]
	Create homogeneity in products	*"I use digital subway (literal translation from "dianzhi zhitongche") to share product information since 2008…"* [Netrepreneur 3] *"In terms of what we sell, I believe that product homogenization (on platforms) promotes quality."* [Netrepreneur 1]
Outcome	Increase in market knowledge and share	*"This digital subway brought us from four to five orders a day, to all of a sudden hundreds or even thousands of orders a day."* [Netrepreneur 3]

With increased market knowledge, *e-commerce associations'* assistance, an information *network* and a delivery system at hand- everything necessary to operate an e-business was at hand. We refer this to developing *information immediacy* which describes the nearness of information, system tools and capabilities to facilitate operations. Netrepreneurs can improve the efficiency of logistics through developing this capability. Establishing a vibrant cooperative network (*heaven and earth*) promotes the production of goods and services in online stores. The platform provides *plug-and-play capabilities*, allowing villagers and netrepreneurs to package their expertise such that they can be quickly and cost effectively distributed and adopted.

Table 4. Development of Information Immediacy

Axial Themes	Empirical Constructs	Representative Evidence
Development of Netrepreneur Embeddedness	Node to network	*"The development of the "heaven network" and "earth network" is important. Where earth (network) is localizing nodes which are distribution centers designated to areas of delivery to address the logistical distribution time delay and expensive cost over long distances, heaven (network) is virtual."* [Netrepreneur 1]
	Virtual network	*"Heaven (network) allows me to input all the product data into one database, so the whole world can download my data to help me in selling things."* [Netrepreneur 1]
Development of Netrepreneur Efficacy	Outsource non-priorities	*"The main core of the product development like packaging and control in my hands, the production is a part in their (other netrepreneurs) hands."* [Netrepreneur 2]
	Alter productive spaces	*"I concentrate on moving work in houses to work in factory buildings where production levels can increase"* [Netrepreneur 4 and 5]
Outcome	Operations efficiency	*"Once this network is completed… my network is bidirectional, and Dongbei's agricultural goods will be transported to each node."* [Netrepreneur 1] *"as long as the buyer is in Dongsan state, the goods will be matched in the nearest warehouse, so time will faster that the goods will arrive in one day"* [Netrepreneur 5]

We observe that netrepreneurs in Qing Yan Liu over time take advantage of operational efficiencies and enabling networks including associations and mergers developed, to maximize the manufacturing value-chain and reposition themselves in the market. We refer this capability to *information liberty* which describes developing the ability to transform information, networks and systems into independence and opportunity. A netrepreneur with specialized knowledge in production can use the expertise of another netrepreneur specializing in design or research and development to create new products and markets. In addition, IT systems are used to support inventory management and keeping stock of orders. This

enhanced fulfillment process can be tied to another important indigenous phenomenon, "*Shanzhai",* which describes Chinese style innovation for budget consumers, particularly in rural areas, and it embodies autonomy (Zhu and Shi 2010). These benefits are not limited to netrepreneurs but also village landlords who see a boom in rental prices, providing wealth and opportunities to the village. Until 2007, Village A was a quiet agricultural community with a population of less than 2,000. Today, Village A has 2,000 online stores, hit 2 billion yuan (USD 328 million) sales in 2013 and has become China's largest e-commerce villages (AliResearch 2012). Many of its 6000 villagers today now work for netrepreneurs.

Table 5. Development of Information Liberty

Axial Themes	Empirical Constructs	Representative Evidence
Development of Netrepreneur Embeddedness	Fulfillment Associations	*"Our first director (Netrepreneur 1) formed a netrepreneurs association. We often meet and help other enterprises who wish to use e-commerce"* [Netrepreneur 3]
	Business mergers	*"They were the number two enterprise in our street, they were already making a lot of money, but they wanted to merge with us and our association to learn about e-commerce. Having them enhances our "earth" network"* [Netrepreneur 3]
Development of Netrepreneur Efficacy	Automating order fulfilment	*"After the transaction, I don't go to collect my goods, I directly send them (nodes) the bill, They will directly help me ship the goods, be responsible for my post-sales service."* [Netrepreneur 2]
	Adjust inventory management	*"Through new software, when I take orders, I don't have to contact back end of plant to check stock, it would just be common sense, and a supermarket."* [Netrepreneur 3]
Outcome	Autonomy of opportunities	*"I now have my branding and have started franchising having distinct distribution lines or chain. For example, I sold my product development (of compression goods) to another person, a shop and dividends, 20% of the shares. Then I handed the whole shop to him, let them try (developing that business)"* [Netrepreneur 3]

From our analysis, we construct a model of how developing information processing capabilities - information literacy, information immediacy and information liberty - enable digital social innovation process and achieve empowerment of netrepreneurs and their community (shown in figure 2).

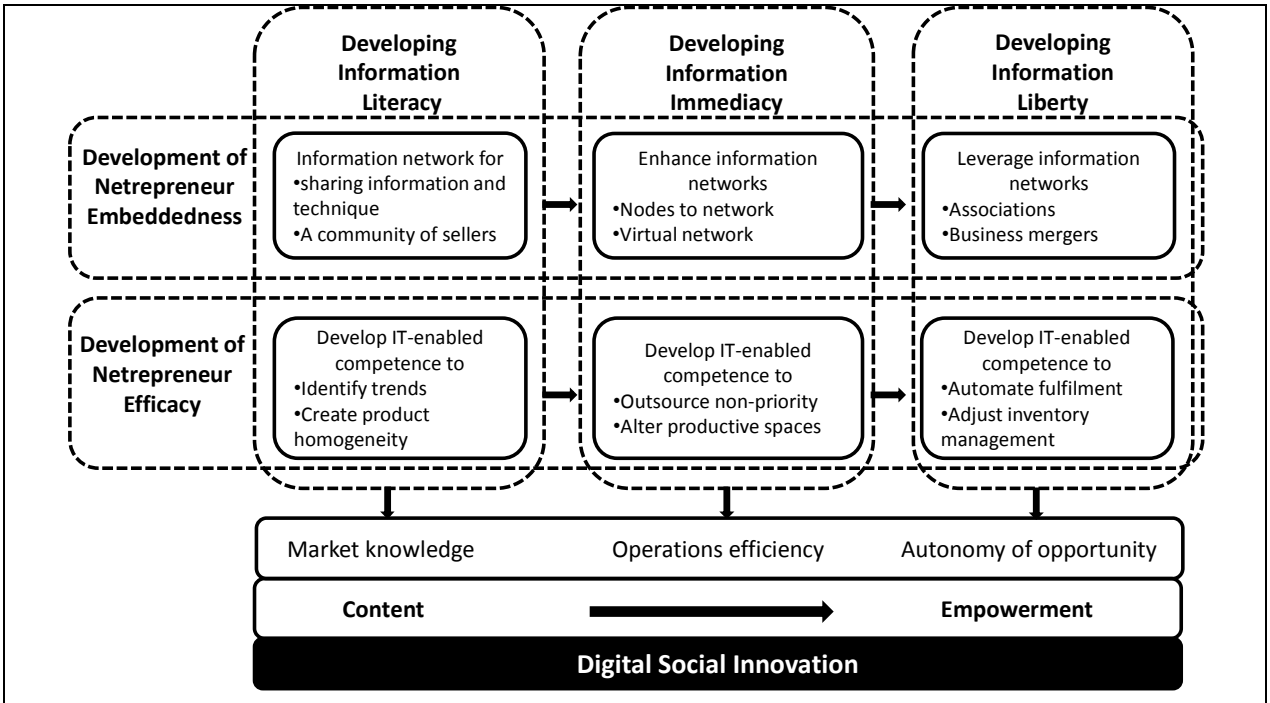

Figure 2. How Information Processing Capabilities enable Digital Social Innovation in Qing Yan Liu Village

Model Implications and Future Work

Our preliminary model makes several theoretical contributions. It shows for the first time to our knowledge, how information processing capabilities enables digital social innovation. The preliminary model shows how social and economic empowerment is achieved through developing information literacy, information immediacy and information liberty capabilities. Capabilities achieve a number of outcomes. Creating market knowledge, operations efficiency and autonomy of opportunities are outcomes that build on one another for netrepreneurs to achieve empowerment. The development of these capabilities relies on netrepreneurs' efficacy and embeddedness. For example, our findings on netrepreneur embeddedness allow the study of social support (Pescosolido 1992) and strength of social relations (Granovetter 2005) within IT-enabled communities that view social challenges as opportunities. This is distinct to literature on inter-firm relationship and alliance as they often tied to interdependencies (Munksgaard 2010; Staudenmayer 1997) which are task-based (Chenhall and Morris 1986) or resource-based (Hsieh et al. 2006; Khoo and Robey 2007; Sirmon and Hitt 2009). Contributing to prior work on the process dimension of social innovation (see Gerometta et al. 2005), our model presents the preliminary steps and roadmap to better understanding the interrelation between netrepreneurs skills and competencies, social enterprise and social entrepreneurship. However, to use the model broadly to study institutional governance, empowerment and capacity building is still immature. Our model does not yet consider the influence of other factors regarding rural market development including capital, labor and product voids (Khanna and Palepu 1997; Mair et al. 2011). To increase the robustness of the model, we intend to test the constructs of the model against the rest of the data. The next step of this synthesis of the remaining sets of village data is crucial, such that it will determine the role of technology and business in social change (process of societal transformation) across all Taobao villages.

Conclusion

Digital social innovation is an emergent stream of social innovation research and a response to growing social, environmental and demographic challenges. Despite its importance, academic literature in this area is still underdeveloped. Researchers have called for more research into understanding individual mechanisms over group mechanisms to fill this research gap. Addressing how information is gathered, synthesized and distributed answer calls for researchers to pay attention to how developing capabilities and access to resources empowers marginalized individuals and communities. We conduct an empirical case study on Qing Yan Liu, China's leading Taobao e-commerce village in late 2013. The authors conducted further site visits to three Taobao Villages in Zhejiang, an eastern coastal province of China, interviewing netrepreneurs, government and provincial officials, merchants and villagers in the process. From our findings and analysis, we construct a research model that posits information literacy, information immediacy and information liberty, as the required information processing capabilities to achieve digital social innovation. Ongoing analysis will extract, confirm, and use pieces of evidence that illustrates this model and the continual interplay between Taobao platform, villagers and the rural community, and to better understanding how digital social innovation is achieved.

Acknowledgements

This research was funded by the National Natural Science Foundation of China (71203131, 71301096).

References

Agarwal, R., Gupta, A.K., and Kraut, R. 2008. "The Interplay between Digital and Social Networks," *Information Systems Research* (19:3), pp. 243-252.

Ahuja, M.K., and Carley, K.M. 1999. "Network Structure in Virtual Organizations," *Organization Science* (10:6), pp. 741-757.

AliResearch. 2012. "Agricultural E-Commerce White Paper."

Amabile, T.M. 1996. *Creativity and Innovation in Organizations*. Harvard Business School Boston.

Avgerou, C., and Li, B. 2013. "Relational and Institutional Embeddedness of Web-Enabled Entrepreneurial Networks: Case Studies of Netrepreneurs in China," *Information Systems Journal* (23:4), pp. 329-350.

Avgerou, C., Li, B., and Poulymenakou, A. 2011. "Exploring the Socio-Economic Structures of Internet-Enabled Development: A Study of Grassroots Netrepreneurs in China," *The Electronic Journal of Information Systems in Developing Countries* (49:4), pp. 1-12.

Bakos, Y., and Katsamakas, E. 2008. "Design and Ownership of Two-Sided Networks: Implications for Internet Platforms," *Journal of Management Information Systems* (25:2), pp. 171-202.

Caulier-Grice, J., Davies, A., Patrick, R., and Norman, W. 2012. "Social Innovation Overview: A Deliverable of the Project," European Commission, Brussels.

Chenhall, R.H., and Morris, D. 1986. "The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems. ," *Accounting Review* (61:1), pp. 16-35.

Compeau, D.R., and Higgins, C.A. 1995. "Computer Self-Efficacy: Development of a Measure and Initial Test," *MIS quarterly* (19:2), June, pp. 189-211.

Conger, J.A., and Kanungo, R.N. 1988. "The Empowerment Process: Integrating Theory and Practice," *The Academy of Management Review* (13:3), pp. 471-482.

Dees, J.G. 1998. "The Meaning of Social Entrepreneurship," *Comments and suggestions contributed from the Social Entrepreneurship Funders Working Group, 6pp*).

Defourny, J., and Nyssens, M. 2008. "Social Enterprise in Europe: Recent Trends and Developments," *Social enterprise journal* (4:3), pp. 202-228.

Defourny, J., and Nyssens, M. 2010. "Conceptions of Social Enterprise and Social Entrepreneurship in Europe and the United States: Convergences and Divergences," *Journal of social entrepreneurship* (1:1), pp. 32-53.

Galbraith, J.R. 1974. "Organization Design: An Information Processing View," *Interfaces* (4:3), pp. 28-36.

Gawer, A. 2009. "Platform Dynamics and Strategies: From Products to Services," in *Platforms, Markets and Innovation,* A. Gawer (ed.). pp. 45-76.

Gephart, R.P., Jr. 2004. "From the Editors: Qualitative Research and the Academy of Management Journal," *Academy of Management Journal* (47:4), pp. 454-462.

Gerometta, J., Haussermann, H., and Longo, G. 2005. "Social Innovation and Civil Society in Urban Governance: Strategies for an Inclusive City," *Urban Studies* (42:11), pp. 2007-2021.

Gillwald, K. 2000. "Konzepte Sozialer Innovation," Papers der Querschnittsgruppe Arbeit & Ökologie, Wissenschaftszentrum Berlin für Sozialforschung.

Granovetter, M. 2005. "The Impact of Social Structure on Economic Outcomes," *The Journal of Economic Perspectives* (19:1), pp. 33-50.

Hagiu, A. 2014. "Strategic Decisions for Multisided Platforms," in: *MIT Sloan Management Review*.

Harding, R. 2004. "Social Enterprise: The New Economic Engine?," *Business Strategy Review* (15:4), pp. 39-43.

Harris, M., and Albury, D. 2009. "The Innovation Imperative," *Why Radical Innovation is Needed to Reinvent Public Services for the Recession and Beyond, Londres, National Endowment for Science, Technology and Arts (NESTA)*).

Hsieh, M.-H., Tsai, K.-H., and Jan Hultink, E. 2006. "The Relationships between Resource Configurations and Launch Strategies in Taiwan's Ic Design Industry: An Exploratory Study," *Journal of Product Innovation Management* (23:3), pp. 259-273.

Huang, P.-Y., Pan, S.L., and Ouyang, T.H. 2014. "Developing Information Processing Capability for Operational Agility: Implications from a Chinese Manufacturer," *European Journal of Information Systems*).

Jiwa, S., Lavelle, D., and Rose, A. 2004. "Netrepreneur Simulation: Enterprise Creation for the Online Economy," *International Journal of Retail & Distribution Management* (32:12), pp. 587-596.

Khanna, T., and Palepu, K.G. 1997. "Why Focused Strategies May Be Wrong for Emerging Markets," *Harvard Business Review* (75:4), pp. 41-51.

Khoo, H.M., and Robey, D. 2007. "Deciding to Upgrade Packaged Software: A Comparative Case Study of Motives, Contingencies and Dependencies," *European Journal of Information Systems* (16:1), pp. 555–567.

Klein, H.K., and Myers, M.D. 1999. "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," *MIS Quarterly* (23:1), pp. 67-93.

Koch, H., and Schultze, U. 2011. "Stuck in the Conflicted Middle: A Roletheoretic Perspective on B2b E-Marketplaces," *MIS Quarterly* (35:1), pp. 123-146.

Kwon, D., Oh, W., and Jeon, S. 2007. "Broken Ties: The Impact of Organizational Restructuring on the Stability of Information-Processing Networks," *Journal of Management Information Systems* (24:1), pp. 201-231.

Langley, A. 1999. "Strategies for Theorizing from Process Data," *Academy of Management Review* (24:4), pp. 691-710.
Langley, A. 2009. "Temporal Bracketing," in *Sage Encyclopaedia of Case Study Research,,* G.D. A. Mills, & E. Wiebe (ed.). Thousand Oaks, CA: Sage Publications, pp. 919-921.
Lettice, F., and Parekh, M. 2010. "The Social Innovation Process: Themes, Challenges and Implications for Practice," *International Journal of Technology Management* (51:1), pp. 139-158.
Lowery, J., Turner, M.L., and Allen, C. 1998. *Netrepreneur: The Dimensions of Transferring Your Business Model to the Internet*. Que Corp.
Mair, J., Marti, I., and Ventresca, M. 2011. "Building Inclusive Markets in Rural Bangladesh: How Intermediaries Work Institutional Voids," *Academy of Management Journal*), p. amj. 2010.0627.
Mair, J., Robinson, J., and Hockerts, K. 2006. *Social Entrepreneurship*. Palgrave Macmillan New York.
Mohan, L., Potnis, D., and Alter, S. 2013. "Information Systems to Support "Door-Step Banking": Enabling Scalability of Microfinance to Serve More of the Poor at the Bottom of the Pyramid," *Communications of the Association for Information Systems* (33:1), p. 25.
Mohr, L.B. 1982. *Explaining Organizational Behavior, the Limits and Possibilities of Theory and Research*. San Francisco, CA: Jossey-Bass Publishers.
Montealegre, R. 2002. "A Process Model of Capability Development: Lessons from the Electronic Commerce Strategy at Bolsa De Valores De Guayaquil," *Organization Science* (13:5), pp. 514-531.
Moulaert, F., Martinelli, F., Swyngedouw, E., and Gonzalez, S. 2005. "Towards Alternative Model (S) of Local Innovation," *Urban Studies* (42:11), pp. 1969-1990.
Mulgan, G. 2006. "The Process of Social Innovation," *Innovations: Technology, Governance, Globalization* (1:2), 2006/04/01, pp. 145-162.
Munksgaard, K.B. 2010. "Exploring Perceptions of Interdependencies: Strategic Options in Supplier-Customer Relationships," *Industrial Marketing Management* (39:6), 2010/9//, pp. 936-946.
Neumeier, S. 2012. "Why Do Social Innovations in Rural Development Matter and Should They Be Considered More Seriously in Rural Development Research?–Proposal for a Stronger Focus on Social Innovations in Rural Development Research," *Sociologia ruralis* (52:1), pp. 48-69.
Newman, M., and Robey, D. 1992. "A Social Process Model of User-Analyst Relationships," *MIS Quarterly* (16:2), pp. 249-266.
Nicholls, A., and Murdock, A. 2011. *Social Innovation: Blurring Boundaries to Reconfigure Markets*. Palgrave Macmillan.
NominetTrust. 2014. "The Social Tech Guide." Retrieved 8 April, 2014, from http://www.socialtech.org.uk/
Pan, S.L., and Tan, B. 2011. "Demystifying Case Research: A Structured-Pragmatic-Situational (Sps) Approach to Conducting Case Studies," *Information and Organization* (21:3), pp. 161-176.
Pescosolido, B.A. 1992. "Beyond Rational Choice: The Social Dynamics of How People Seek Help," *American Journal of Sociology*), pp. 1096-1138.
Phills, J.A., Deiglmeier, K., and Miller, D.T. 2008. "Rediscovering Social Innovation," *Stanford Social Innovation Review* (6:4), pp. 34-43.
Pol, E., and Ville, S. 2009. "Social Innovation: Buzz Word or Enduring Term?," *The Journal of Socio-Economics* (38:6), pp. 878-885.
Premkumar, G., Ramamurthy, K., and Saunders, C.S. 2005. "Information Processing View of Organizations: An Exploratory Examination of Fit in the Context of Interorganizational Relationships," *Journal of Management Information Systems* (22:1), pp. 257-294.
Scheyvens, R. 1999. "Ecotourism and the Empowerment of Local Communities," *Tourism management* (20:2), pp. 245-249.
Scott, S.G., and Bruce, R.A. 1994. "Determinants of Innovative Behavior: A Path Model of Individual Innovation in the Workplace," *Academy of management journal* (37:3), pp. 580-607.
Short, J.C., Moss, T.W., and Lumpkin, G.T. 2009. "Research in Social Entrepreneurship: Past Contributions and Future Opportunities," *Strategic entrepreneurship journal* (3:2), pp. 161-194.
Sirmon, D.G., and Hitt, M.A. 2009. "Contingencies within Dynamic Managerial Capabilities: Interdependent Effects of Resource Investment and Deployment on Firm Performance," *Strategic Management Journal* (30:13), pp. 1375-1394.
Staudenmayer, N.A. 1997. "Interdependency : Conceptual, Empirical, and Practical Issues (Working Paper)," Massachusetts Institute of Technology (MIT), Sloan School of Management, pp. 1-58.

Taibi, A.D. 1994. "Banking, Finance, and Community Economic Empowerment: Structural Economic Theory, Procedural Civil Rights, and Substantive Racial Justice," *Harvard Law Review*), pp. 1463-1545.
Taylor, S.J., and Bogdan, R. 1998. *Introduction to Qualitative Research Methods*, (3rd ed.). New York: John Wiley.
Turban, E., and King, D. 2011. *Electronic Commerce 2012: Managerial and Social Networks Perspectives*. Pearson Higher Ed.
Turner, K.L., and Makhija, M.V. 2012. "The Role of Individuals in the Information Processing Perspective," *Strategic Management Journal* (33:6), pp. 661-680.
Tushman, M.L., and Nadler, D.A. 1978. "Information Processing as an Integrating Concept in Organizational Design," *Academy of Management Review* (3:3), pp. 613-624.
Uzzi, B. 1997. "Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness," *Administrative Science Quarterly*), pp. 35-67.
Walsham, G. 1995. "Interpretive Case Studies in Is Research: Nature and Method " *European Journal of Information Systems* (4:2), pp. 74-81.
Walsham, G. 2006. "Doing Interpretive Research," *European Journal of Information Systems* (15:1), pp. 320-330.
Walsham, G., and Sahay, S. 2006. "Research on Information Systems in Developing Countries: Current Landscape and Future Prospects," *Information Technology for Development* (12:1), pp. 7-24.
Wang, L. 2012. "Social Exclusion and Education Inequality: Towards an Integrated Analytical Framework for the Urban–Rural Divide in China," *British Journal of Sociology of Education* (33:3), pp. 409-430.
Woodman, R.W., Sawyer, J.E., and Griffin, R.W. 1993. "Toward a Theory of Organizational Creativity," *Academy of management review* (18:2), pp. 293-321.
Zhu, S., and Shi, Y. 2010. "< It> Shanzhai</It> Manufacturing–an Alternative Innovation Phenomenon in China: Its Value Chain and Implications for Chinese Science and Technology Policies," *Journal of Science and Technology Policy in China* (1:1), pp. 29-49.