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## RESEARCH ARTICLE

### Conceptual Study of the Relationship between ICT and Social Capital in rural settlements: Case study Iran experiences.

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#### Abstract

Rural social capital is one of the influential concepts in social sciences to understand contemporary societies. It has been found to influence many aspects of social life, directly or indirectly. It is also increasingly explored in relation to Information and Communications Technology (ICT). Nevertheless, rural social capital is a challenging variable to research, in part because of its multiple divergent definitions and measures. This paper proposes a model for understanding how ICT affects rural social capital and vice versa. It begins by presenting a review of rural social capital and then builds a framework to classify and organize ICT-related rural social capital studies. Using this framework, we identify the gaps in the ICT related rural social capital research and develop a number of propositions related to the role of ICT in rural social capital building and maintenance. Finally, the analysis suggests that the changes in rural social capital caused by ICT result in some degree of mobility in social interaction obtainable by using ICT over time. We conclude by outlining some research challenges in this research stream. Finally practical suggestions offered.

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#### Introduction

Rural social capital has recently gained importance in a variety of research fields. The central proposition of Rural social capital theory is that "social networks have value" (Putnam, 2000: p. 19). That is, social networks constitute valuable resources, which facilitate certain actions of participants within the networks (Bourdieu, 1986a, Burt, 2001, Coleman, 1990, Portes, 1998, Putnam, 1995a, Putnam, 1995b, Putnam, 2000). Initially, this term was used mostly in sociological and political discourses, but it has lately been applied in other fields, and become an influential concept in understanding the contemporary world. Since people's relationships matter greatly to themselves as individuals and as members of communities, rural social capital has been found to influence many aspects, such as the development of human capital (Coleman, 1988, Fiorgas, 2000), quality of life (Dekker and Uslaner, 2001, Kennelly et al., 2003, Spence and Schmidpeter, 2003), health (Liukkonen et al., 2004, Rose, 2000) economic performance (Baron et al., 2000, Grootaert et al., 2004), and innovation diffusion (Fountain, 1997).

With the development of Information and Communications Technology (ICT), the interactions between ICT and rural social capital in organizations or society at large have caught both researchers' and policymakers' attention. However, studies in this area are still very limited and do not produce consistent results. First of all, few agreements on the role of ICT in rural social capital building have been reached to date. Some researchers believe that electronic technology contributes to the decline of rural social capital based on an analysis of the impact of TV (see Putnam 2000 as an example), whereas others argue that ICT, such as the Internet, facilitate rural social capital building (see Hampton et al. 2003 for example). This indicates that findings about the relationship between one particular technology and rural social capital cannot be directly applied to other technologies. It basically indicates that little is known about the relationship between ICT and rural social capital, that is, about how ICT affects rural social capital and vice versa.

To enhance our knowledge in this area, this study further explores the relationships between rural social capital and ICT. It develops six propositions about these relationships, and then highlights directions for further research of significance. For the purpose of the study, we define rural social capital as an individual's network of social relationships and the qualities of those relationships, which enhance the ability of participants to associate with each other for mutual benefits. Therefore, rural social capital is not simply related to the extent to which people are connected to others, but also to the nature of those connections.

The paper is organized as follows. First, the background literature on rural social capital theory is presented. It is classified into two categories: "individual" rural social capital and "collective" rural social capital. Second, the rural social capital studies in the context of ICT acceptance and usage are reviewed. Those studies are classified according to the role of rural social capital in relation to ICT – whether rural social capital is a dependent variable or an independent variable in a corresponding study. The issues emerging from the examination of the framework are identified and propositions related to how ICT impacts rural social capital are proposed, followed by the research plan for testing those propositions. Finally, conclusions are drawn and implications for further investigation are discussed.

### **Rural social capital Theory:-**

The concept behind rural social capital is nothing new in sociological research (Field, 2003, Portes, 1998). Classical social theories, such as works of Durkheim and Marx, already suggest that the involvement and participation in groups can have positive consequences for individuals and communities (Portes 1998). The first systematic analysis of rural social capital was made by Pierre Bourdieu (1986) and a clear theoretical framework was developed by James Coleman (1988, 1990) who is the first to conduct the empirical investigation on this concept (Adam and Roncevic, 2003, Baron et al., 2000, Field, 2003). It is Robert Putman who correlates levels of rural social capital with traditional public policy concerns and successfully exported the concept out of academia into a wider media (Adam and Roncevic, 2003, Baron et al., 2000, Field, 2003, Schuller et al., 2000).

In recent years, research on rural social capital is growing fast across many social science disciplines, such as sociology, politics, public health and economics, among others. One study of the social science literature found that the number of journal articles listing rural social capital as a keyword was 20 before 1981. This had risen to 109 between 1991 and 1995, and 1003 between 1996 and March 1999 (Baron et al., 2000).

Although researchers in different disciplines agree on the significance of relationships as a resource of social action, they lack an agreement on a precise definition on rural social capital. They are broadly similar with some nuance. To a certain extent, the definitions vary depending on the level of analysis that corresponding theories involve (Portes 1998; 2000). Studies of rural social capital can be roughly grouped into two categories: individual rural social capital and collective rural social capital. Some theories, such as those by Bourdieu (1986) and Coleman (1990), mainly regard rural social capital as resources generated by an individual's social network for his or her mutual benefits. Rural social capital defined from this point of view is labeled as individual rural social capital (Portes, 2000). Others, such as those by Putnam (1995a, 1995b, 2000) and Woolcock and Naryyan (2000), consider rural social capital as both people's social network and their moral attitude or social norms contributing to the common good of a whole community or even a nation. Rural social capital defined from this approach is referred to as collective rural social capital (Portes 2000).

### **Rural social capital as an Attribute of Individuals**

As mentioned above, the contemporary theoretical development of rural social capital concept started from the work of a French sociologist, Bourdieu (1986) and that of an American sociologist Coleman (1988, 1990), independently. Other important theories on rural social capital at the individual level include Lin's network theory of rural social capital (Lin et al., 2006, Lin, 2001a, Lin, 2001b), Burt's theory regarding structural holes and network closure as rural social capital (Burt, 2001), and Portes's theory which argues that rural social capital is "the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (1998 p. 6). They focus on individuals or small groups as the unit of analysis and examine the benefits accruing to individuals by their ties with others. For example, Bourdieu (1986) emphasizes that capital is accumulated labor, and he divides capital into three fundamental classes: economic capital, cultural capital and rural social capital. Economic capital "is immediately and directly convertible into money and may be institutionalized in the form of property rights" (p. 243); cultural capital "may be institutionalized in the form of educational qualifications" (p.

243); and rural social capital is an individual feature, which is “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition” (p. 248).

Coleman (1990), on the other hand, takes rational action as a starting point and suggests that “Rural social capital is defined by its functions, it is not a single entity, but a variety of different entities having characteristics in common: they all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure” (p. 302). According to Coleman, rural social capital can take on forms such as obligations and expectations, information potential, and norms and effective sanctions. His definition is important because it implies a shift of understanding rural social capital from individual level to collective level (Adam and Roncevic, 2003).

#### **Rural social capital as a Feature of Communities:-**

The conceptual extension of rural social capital from an individual asset to a community or national feature, initiated by a political scientist Robert Putnam (1995a; 2000), made it possible to discuss rural social capital possessed by communities and even nations, and the consequent effects of their development.

Putnam (2000) states the core idea of rural social capital theory that social networks have value, and emphasizes the character of rural social capital as a community level resource. He defines rural social capital as “...connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (p. 21). The core arguments in Putnam’s research are: (1) social networks and social norms matter for societal cooperation, coordination and collaboration; (2) rural social capital has important consequences for democracy; and (3) rural social capital has declined in post-war America. One of the most pressing questions for the future, in Putnam’s view, is how to reverse America’s declining rural social capital and restore civic engagement and trust.

The results of subsequent studies on rural social capital and civic engagement mainly support Putnam’s opinion that rural social capital is significantly related to indicators of socio-economic development and democratization (Cox, 2002, Fukuyama, 1995, Norris, 2000, Quan-Haase and Wellman, 2004, Williamson, 2004). Researchers, such as Fukuyama, point out that rural social capital promotes a kind of associational life that is necessary for the success of government and democracy and is critical for understanding development (Fukuyama, 1995).

#### **Research on Rural social capital and ICT**

Currently, great efforts are being made to explore the influence of ICT on society. At the same time, some IS researchers increasingly become aware of the important role of rural social capital in technology development and knowledge sharing processes (Syrjanen and Kuutti, 2004, Riemer, 2004, Fountain, 1997).

To locate publications on rural social capital and ICT related topics, keyword searches were employed across a large range of databases on Information Systems, Sociology, and Political Science. The key resources include the Web of Science, International Bibliography of the Social Sciences, ISI Current Contents Connect, JSTOR, Science Direct, and Sociological Abstracts. The Web of Science citation index was a particularly powerful tool in this process. To trace sources not yet indexed in the conventional tools, the web search engine Google Scholar was also employed. Two sets of keywords were used to address research on rural social capital and related theories (A), and research on various aspects/elements of ICT (B), respectively. The primary keywords adopted in the searches were combinations of words (e.g. rural social capital and Internet) selected from each set. The time span of each search was 1996 to 2007. Only publications during this period are included for analysis because research on rural social capital and ICT has bloomed since the extension to ICT of rural social capital theory by Robert Putman in 1990s (Baum 2000).

The reviewed studies examine the relationships between rural social capital and ICT from two different angles distinguished by the role of rural social capital in research design, which is concerned with whether rural social capital plays the role of a dependent variable or of an independent variable in examining the relationships. For example, some studies focus on the impacts of ICT on rural social capital building and maintenance (dependent variable), whereas others on the effects of rural social capital (independent variable) on the development and use of ICT.

In Section 2, we used the unit of analysis as an important criterion for classifying the studies of rural social capital. The unit of rural social capital analysis is concerned with whether the rural social capital concept is defined as an asset of an individual or a feature of a community. By intersecting the two criteria (the unit of analysis and the role

of rural social capital in research design), we obtain four categories of the rural social capital and ICT research. We can place exemplary or representative studies into each category and map the current state of the research in the area, as shown in Table 1.

#### **Categories of Current Research on Rural social capital and ICT**

In the upper-left cell, rural social capital is treated as a dependent variable and measured at the individual level. We call the concept of rural social capital in this category **Connecting Rural social capital** because rural social capital measurement here is closely related to connecting people. Studies in this category aim to examine the impacts of ICT on individuals' social networks and the possible benefits generated by those networks, such as higher social satisfaction and easier to find a job.

In the lower-left, rural social capital is also treated as a dependent variable but measured at the collective level. We call the concept of rural social capital in this category **Changing Rural social capital** not only because research in this category is initiated by interest in finding out reasons for the decline of rural social capital, but also because most studies in this category aim to identify the role of ICT in rural social capital building in communities. The effects of ICT, typically TV, Internet and community networks, are widely discussed in relation to dimensions of rural social capital such as social network and social norms, and outcomes of rural social capital such as civic engagement and democracy processes.

Not only had the impacts of ICT on rural social capital at different levels attracted researchers' attention, the effects of rural social capital on ICT development are also explored by many researchers. Since it is suggested that rural social capital brings positive outcomes in many realms of society such as public health, economic development and civic engagement, we can infer that rural social capital can play a role in technology adoption, diffusion and use. Research in the upper-right cell focuses on the effects of individual rural social capital. Relatively fewer studies target on individual rural social capital explicitly. However, terms such as "social influence" and "social norms" are often mentioned as related to the individual rural social capital concept and discussed in some technology acceptance studies. We consider those studies as implicitly connected to rural social capital and ICT development and include them in this review. Because many reviewed studies include the social factor as an influencing factor in technology acceptance in certain circumstances, we call the concept of rural social capital in this category

#### **Influencing Rural social capital.**

In the lower-right cell, effects of rural social capital are examined at the collective level. Rural social capital in this category is called **Enabling Rural social capital** because research in this category regards rural social capital as the enabler of technology diffusion. In this category, rural social capital is considered as a feature that already exists in communities before the introduction of ICT, and could have a powerful influence on an ICT project and its outcomes.

**Table1.** Four categories of rural social capital and ICT studies

<b>Level of analysis</b>	<b>Role of SC</b>	<b>Dependent variable</b>	<b>Independent variable</b>
<b>Individual</b>	<b>Connecting SC</b>	Haythornthwaite, 2001 Papakyriazis and Boudourides, 2001 Haythornthwaite, 2002 Reich and Kaarst-Brown, 2003 Hiller and Franz, 2004 Matzat, 2004 Schultze and Orlikowski, 2004 Selwyn, 2004 Steinfeld, 2004 Drentea and Moren-Cross, 2005	<b>Influencing Rural social capital</b> Bianchi and Robinson 1997 Gargiulo and Benassi, 2000 Täube and Joye, 2001 Anderson, 2004 Frank et al., 2004 Hall and Graham, 2004 Newell et al., 2004 Hatzakis et al., 2005 Yang, 2005 Chou et al., 2006 Honig et al., 2006 Lin et al., 2006
<b>Collective</b>	<b>Changing Rural social capital</b>	Norris, 1996 London, 1997 Bianchi and Robinson, 1997, Beckers and Gen, 1997 Blanchard and Horan, 1998 McBride, 1998 Uslaner, 1998 Wellman, 1998 Franzen, 2000 Uslaner, 2000 DiMaggio et al., 2001 Hampton, 2001 Kavanaugh and Patterson, 2001 Nie, 2001 Shah et al., 2001 Wellman et al., 2001 Wellman, 2002 Foth, 2003 Goodman, 2003 Hampton, 2003 Hampton and Wellman, 2003 Ling et al., 2003 Millen and Patterson, 2003 Norris, 2003 Pierce and Lovrich JR., 2003 Hardin, 2004 Hopkins and Tomas, 2004 Hüsing, 2004 Lengnick-Halla and Lengnick-Halla, 2004 Pigg, 2004 Quan-Haase and Wellman, 2004 Resnick, 2004 Uslaner, 2004 Williamson, 2004 Information Economy Division, 2005 Kavanaugh and al., 2005b Shah et al., 2005 Beaudoin and Thorson, 2006 Huysman and Wulf, 2006 Sugiyama and Katz	<b>Enabling Rural social capital</b> Fountain, 1997 Bebbington and Perreault, 1999 Robalino, 1999 Isham, 2000 Jonathan T. Isham, 2000 Borgida et al., 2002 Han, 2002 Sullivan et al., 2002 Kosonen Riemer and Klein, 2004 Simpson, 2005 Wang et al., 2006 Hsieh and Tsai, 2006

**Gaps in the Research to Date**

Based on the number and variety of articles contenting with some aspect of ICT and rural social capital, there appears to be strong interest in understanding the relationship of ICT and rural social capital. It is widely agreed that rural social capital positively related to the development, adoption and use of ICT, at both individual and collective level. However, it gives rise to much controversy about the role of ICT in rural social capital. Specifically, the reviewed studies provide a rich narrative of how different patterns of ICT use, typically TV and the Internet use, impact on collective rural social capital measured by civic participation, trust, social norms, etc. However, some issues are emerging. First, the majority of rural social capital studies relevant to ICT deal with the collective rural social capital, whereas only a few pay attention to the individual rural social capital. Second, findings from previous studies about the impacts of certain ICT on rural social capital are hard to generalize. Moreover, no research explains why and how the changes of rural social capital occur due to technology use. Each of these is further discussed below.

*Imbalance in Analysis Levels*

As discussed above, the majority of rural social capital related ICT studies measure rural social capital at the collective level, particularly within the category of changing rural social capital in our framework. This is understandable when we consider that the rural social capital theory becomes flourishing only after the introduction of collective rural social capital by Robert Putnam. The most significant drivers for researchers and policymakers to pay attention to rural social capital are (a) the potential benefits it may provide to communities, and (b) the changes of rural social capital in communities, especially the decline of rural social capital warned by Putnam (Putnam, 2000).

*Issues Regarding Generalization*

Studies on rural social capital and ICT usually choose one particular technology, typically TV or the Internet, for investigation. It seems that many recent findings, in contrast with previous ones, tend to support the argument that ICT has positive impacts on rural social capital building (Norris, 1996, Norris, 2003, Shah et al., 2001, Wellman, 2001, Rheingold, 2002, Srivastava, 2005, Hampton and Wellman, 2003, Kavanaugh and al., 2005a). However, most of the recent studies examine the role of the Internet in rural social capital building, while the previous ones, following Putnam, investigate mainly TV. Therefore, the effects of ICT on rural social capital may be different depending on the type of technology and findings based on the investigation of one particular technology cannot be generalized to other technology without proper evaluation.

*Lack of Theoretical Explanation about Why and How Rural social capital Changes Due to ICT*

Most information systems research on other topics is mainly devoted to “what” as opposed to “why” or “when” relationships exist (Lee et al., 1997). For example, Shah (2001) explores the relationship between Internet use and the production of rural social capital using the 1999 DDB Life Style Study. Although the associations between the Internet use and some of the factors related to civic engagement interpersonal trust and life contentment are reported, the reasons resulting in those associations are not discussed. Likewise, there is no theoretical framework that sufficiently explains why the ICT consumption leads to changes in rural social capital in existing studies. The explanation about the causality between watching TV and declining rural social capital given by Putnam (2000) is that “watching things (especially electronic screens) occupies more and more of our time, while doing things (especially with other people) occupies less and less”. However, this explanation could not be generalized to relationships between other technologies and rural social capital. The majority of other studies on ICT use and rural social capital only report the association or relationship between those two phenomena but make no effort to explain, theoretically, why this happens. In particular, little is known about how mobile technologies affect the rural social capital at both individual and collective levels.

Given these key points, we now seek to address some of the gaps. We believe that the two separate streams (individual and collective) in the ICT-rural social capital research are not isolated to each other and look for connection between them. At same time, the key feature of ICT that distinguishes it from other technologies needs to be explored. It might be the enlightenment for understanding changes of rural social capital ensued as well as resulted in ICT. We, therefore, devote the remainder of the paper to discuss the mechanism that enables the interaction between rural social capital and ICT, focusing on mobile technologies.



**Relationship between ICT and Rural social capital**

Before we head for developing some propositions related to ICT-rural social capital interaction, we would like to share some of our thoughts on rural social capital theories. As we mentioned early in this paper, scholars in different disciplines lack an agreement on a precise definition on rural social capital. Rural social capital theories, then, are categorized into individual rural social capital and collective rural social capital based on the level of analysis that corresponding theories involve. However, the rural social capital literature described early in this paper (e.g. Bourdieu 1986; Burt 1992; Lin 1999; Putnam 2000; World Bank 2003) also highlights the importance of social interaction in building and maintaining rural social capital. As Lin (1999) states “The premise behind the notion of rural social capital is rather simple and straightforward: investment in social relations with expected returns. (p. 30) ... Individuals engage in interactions and networking in order to produce profits. (p. 31). This consensus provides us a juncture in linking rural social capital, at both individual and collective level, and ICT, which enables human beings greater capability in social interaction than ever before.

As Lin (1999) points out, rural social capital is both individual and collective. That is, institutionalized social relations with embedded resources are expected to be beneficial to both the collective and the individuals in the collective. Regarding the impacts of ICT, it could change individual rural social capital as well as collective rural social capital. However, these changes do not happen at one time. ICT, such as the Internet and mobile phone, is firstly used by some individuals and progressively diffuses to a larger population. Its impacts on social behaviors and phenomena, including rural social capital, should be progressive, as well. Therefore, we believe the research about the way in which individuals react to and use ICT provides some of the basic information for understanding the way in which such technology will or should develop and the impact that it is likely to have upon our society. Until the fundamental questions as to the use of new ICT by individuals or small groups have been answered, it seems unlikely that gross predictions relating to the society as a whole will be valid. By saying this, we do not suggest that the research on ICT-rural social capital should not be taken at the collective level, but emphasize that we should pay attention to the impacts of ICT on individual rural social capital, especially when a particular technology is in its early developing stage. In addition, we argue that impacts of ICT on rural social capital build up from individual to collective.

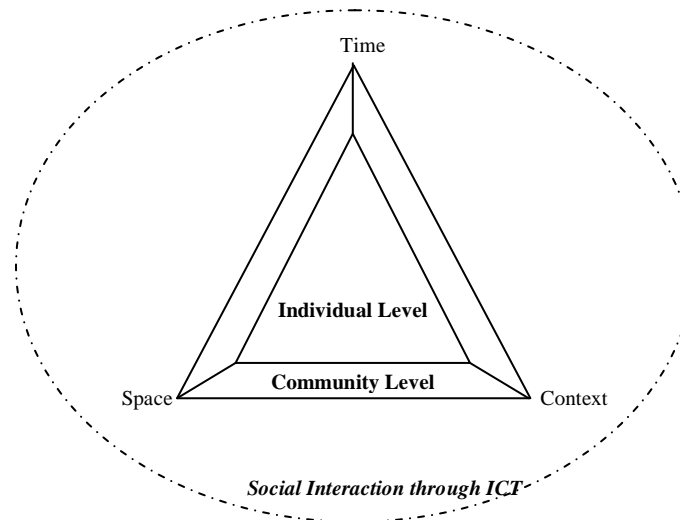
ICT, including mobile technologies, are developed to extend human communication capability by breaking through the limits, such as time difference and geographical distance, and enables human interaction greater mobility than ever before. As Ling and Haddon (2001) point out, there are three general phases in the way mobility has been coordinated in social interaction. In the first phase, which was the period before telegraphy, communications could only be delivered by human beings. In the second phase, with the development of telegraphy, one could send a message to a remote person without traveling physically. The communication barriers caused by spatial separation were partly resolved, and the speed of messages was many times faster than the speed of physical travel. However, technology-mediated communication in this period required people to access a device at a fixed location in order to send and receive a message. The third phase, which we are now experiencing, removes the condition on fixed locations for the sending and receiving equipment. People who want to send a message are relatively free to choose where they will initiate the communication by using mobile technology, typically mobile phone. In addition, there is no need to know the location of the person whom they wish to contact.

Kakihara and Sorensen (2002) argue that ICT, particularly mobile technology, is continuously reshaping human interaction. This interaction is the precondition of rural social capital maintenance and recreation at both individual and collective level (Lin 1999). Rural social capital is productive but it can be depleted if it is not renewed (Coleman, 1990). It inheres in social networks, which are the structure of relations among actors. Social networks, however, are not a nature given and must be constructed and renewed through investment strategies oriented to the institutionalization of relations (Bourdieu, 1986b). Social interactions are effective strategies for constructing social networks and creating trustworthiness and norms of reciprocity. Mobility, which facilitates and transforms social interaction, therefore, is central to gluing social networks together and can help to avoid social exclusions that reduce social proximity and rural social capital (Urry, 2002). Therefore, we propose that the degree of mobility obtainable by using ICT is the mechanism through which the ICT affect rural social capital. Moreover, mobility is not a simple concept but a complex multi-dimensional phenomenon, which, we argue, should be analysed through time, space/place and other contextual conditions of human interaction processes. The model for analysing impacts of ICT on rural social capital on both individual and collective level is presented as Figure 1 and is further discussed below.

### Development of the Propositions

While many studies consider mobility as human independence from geographical constraints (Urry, 2002), Kakiyara and Sorensen have sought to develop a conception of mobility which extends the traditional view of the way people interact with others in their social lives (Kakiyara and Sorensen, 2002). By relating mobility to interaction, they expand and deconstruct the concept to embrace temporal, spatial and contextual mobility.

Temporal mobility is concerned with the increasingly mobilized human interaction in terms of time. The temporality of human interaction is now highly mobilized into multiple temporal modes and can no longer be explained from a linear “clock-time” perspective. This leads to a complex social environment where monochronicity and polychronicity of interaction among humans are intertwined and renegotiating with each other (Kakiyara and Sorensen, 2002). Monochronicity refers to situations where people only focus on one activity at a certain time, while polychronicity signifies situations where people deal with several things at the same time (Hall, 1983, Kakiyara and Sorensen, 2002).



**Figure 1** A Tripartite View of ICT-rural social capital relationship

Spatial mobility refers not only to the wide-ranging geographical movement of people, but also to the mobility of objects (such as mobile phone and Walkman), symbols (such as information, sound and image) and space itself (such as virtual spatiality, that is, “virtual community” dissolves the geographical boundary) (Kakiyara and Sorensen, 2002).

Contextual mobility refers to a relative freedom of contextual constraints of interaction. Human actions are essentially situated in particular contexts. Those contexts include people’s cultural background, particular situation or mood, degree of mutual recognition, and so on. In face-to-face interaction among people, conformity of such contextual aspects is very important, while by using ICT applications and mediated communication media, people can easily interact with others regardless of the contexts (Kakiyara and Sorensen, 2002).

Using Kakiyara and Sorensen’s analysis of mobility as starting point, time, space and other contextual issues in ICT-rural social capital interaction are considered in turn.

### Time

Time is one of the fundamental parameters of the orderliness characterizing human involvement with the world. However, it means different things to different people in different situations. When defining the nature of time, sociologists typically take one of two streams: (a) describe differences between concepts of “social-time” and “clock-time” or (b) work out metaphors of time patterning. Zerubavel (1979, 1981) proposes that human actions are with “socio-temporal order”, a structure mapped by sequences, durations, temporal locations and rates of recurrence. Sequence is the order in which events typically occur. Duration is how long events or situation last. Temporal location refers to when the events usually occur, and rate of recurrence is about how often the events occur. Those “cycles, rhythms, beginnings, endings and transition points not only support a social structure’s aura of objectivity and predictability but also aid us in defining out roles, out obligations and the tenor of our relationships”(Barley



1988, p.125). Barley further points out that it is useful to distinguish between the structural and interpretive aspects of a temporal order. Structural attributes are those external aspects of a temporal world that can be described more or less reliably by an independent observer. Four parameters – sequence, duration, temporal location and rate of recurrence – are important. Interpretation composes the internal parameters of temporal world. They are not as immediately obvious but formed by evaluating events against the structural parameters. The analysis of socio-temporal order can also help us understand Monochronicity vs. Polychronicity in human behaviour. ICT enables people not only to exchange information fast and save time, but also communicate with people while doing something else. It potentially facilitates users' social interaction, which plays fundamental role in rural social capital formation (Putnam, 2000). Therefore, we propose,

Proposition 1a: ICT use is positively related to individual's perceived temporal mobility

Proposition 1b: Temporal mobility obtainable by using ICT Rural social capital is positively related to an individual's rural social capital

### *Space*

Studies have shown that the spatial mobility helps people overcome interaction difficulties caused by spatial separation, which facilitates the construction of social networks and receipt of social support (Cook and Weigel, 1983, Kakiyama and Sorensen, 2002). The use of technologies for mobility involves changes in the modes of space. Take mobile technology for example, information and messages can be sent to a mobile phone regardless of its location. Wellman (2001), thus, views wireless communications as expressing a new phase in social communications and networking. He termed non-technological communication as door-to-door communications, the automobile and the telephone communications as place-to-place, while wireless communications as person-to-person ones detached from household location and its communications infrastructure. Such changes permit the overcoming of space through time at growing speeds. Those feature of ICT indicate great potential in enhancing users' spatial mobility (Kakiyama and Sorensen, 2002). We accordingly propose,

Proposition 2a: ICT use is positively related to individual's perceived spatial mobility

Proposition 2b: Spatial mobility obtainable by using ICT is positively related to an individual's rural social capital

### *Other Contextual Issues*

Besides time and space, other contextual factors, including associator with the ICT users when communication, mood of the users and purpose of the communication, are also needed to be considered. ICT influences the contextuality of interaction in various ways. For example, teenagers may prefer to use SMS because they are in public, where voice calling may be not appropriate. Kakiyama and Sorensen (2002) further argue that computer mediated communication can provide people with access to a wider range of weakly tied actors and a wider set of contacts, extending communication possibilities beyond various contextual constraints. Based on this point of view, ICT can make interaction easy by conquering some obstacles in face-to-face interaction. Therefore, ICT can increase users' contextual mobility, and enhance their rural social capital. In summary, we propose,

Proposition 3a: ICT use is positively related to individual's perceived contextual mobility

Proposition 3b: Contextual mobility obtainable by using ICT rural social capital is positively related to an individual's rural social capital

Besides the time, space and contextual issues discussed above, mobility obtained by using ICT may differ among people of different ages, genders and socioeconomic status (Ling and Haddon, 2001, Haddon et al., 2002, Cook and Weigel, 1983, Oksman and Turtiainen, 2004). Individuals' rural social capital may be also different because of those demographic characteristics (Cook and Weigel, 1983, Cox, 2002). Oksman and Turtiainen (2004), for instance, point out that the function of mobile communication for teenagers is different from adults. The most important purpose for teenagers to use mobile communication is to maintain their social networks and to form new relationships. Castells et al. (2004), on the other hand, report that the perceived and actual utility functions also differ between the gender groups. Generally, women are more likely to use the mobile phone to maintain intimate social relationships while men prefer to use it for instrumental purposes. As for socioeconomic status, research shows that people suffering socioeconomic disadvantages, for instance, those with poor education or unemployed, usually are low in their stock of rural social capital (Cox 2002). At the same time, people with low rural social capital are less likely to use ICTs for social purpose (Kavanaugh et al. 2005). At collective level, culture of groups

or even nations can be one of the significant influence factors on ICT-rural social capital interaction as well. All these and other factors are worth dwelling on in future research.

#### **Proposed Empirical Investigation**

To test the above propositions, an empirical investigation will be conducted in Australia and South Korea. The target population of this project is young people aged between 18 and 24. Diary-interview method, which combines diaries that recording people's activities in a certain period and brief interviews that requiring participants to explain the activities they fill in the diaries with information that interests the researchers (Zimmerman and 1977), is adopted to identify the pattern of mobile phone use and the possible relationships among mobile phone, mobility and rural social capital building and maintenance.

According to ITU (2004 in Castells et al. 2004), Australia is the only non-European country that has mobile phone penetration rates above the OECD average till 2003. In fact, in Australia, the mobile phone networks (GSM and CDMA) already reached over 98 per cent of the population by the end of 2002. Nearly 80 per cent of the Australian population own mobile phone in 2004 (The Allen Consulting Group 2004). Nonetheless, in Australia, mobile phones are mainly used for voice calling and SMS, although new data services, such as mobile Internet, have been introduced. South Korea, on the other hand, has the fastest-growing mobile penetration rates in the Asia-Pacific region and has the largest penetration of mobile Internet users in the world. In 1999, the number of mobile telecommunication services subscribers surpassed that of fixed-line subscribers, while it is predicted that demands for wireless access will exceed the number of fixed access lines by year 2010 in the world. South Korea is also the first country introducing CDMA and distributing 3G services. It is the natural comparison object to Australia where the mobile data service market is relatively under development but could possibly take advantage of late move. The comparison research between Australia and South Korea can provide good lenses for better understanding in the social consequences of mobile technology.

#### **Conclusion:-**

This paper proposes six propositions in relation to the impact of ICT on rural social capital, taking into account the concept of mobility. Rural social capital is one of the influential concepts in social sciences to understand contemporary societies. It is also increasingly explored in relation to ICT. We first build a framework to classify and organize previous ICT-rural social capital studies. This framework is constructed by intersecting two criteria: the level of rural social capital analysis and the role of rural social capital in research design. In the former, two different but related concepts are identified: individual rural social capital and collective rural social capital. In the later, two streams of research are found: those using rural social capital as a dependent variable and those using rural social capital as an independent variable. The intersection of the two criteria produces a matrix of four categories of research on the interaction between rural social capital and ICT. After discussing representative studies in each category, we find gaps in the rural social capital research in relation to ICT, including (a) imbalance in analysis levels, (b) issues regarding generalization, and (c) lack of theoretical explanation of why and how rural social capital changes due to ICT.

In order to address those gaps we, then, evaluate the possible roles of ICT in rural social capital building and maintenance and develop a number of propositions. Although most current research on this topic focus on the collective rural social capital, we suggest that research about ICT and individual rural social capital is fundamental in understanding the role ICT in our society and the impact of ICT on certain social phenomena, including rural social capital should be built up from individual to collective. Using Kakiyama and Sorensen's (2002) analysis of mobility as starting point, we discuss time, space and other contextual issues in ICT-rural social capital interaction in turn. Our theoretical analysis suggests that the changes in rural social capital caused by ICT result in degree of mobility in social interaction obtainable by using ICT over time.

This study does not only enhance our understanding about the interaction between ICT and rural social capital, but also points out the way to measure this interaction. According to the previous research, one of the greatest challenges in ICT-rural social capital research is to define exactly what rural social capital is and to measure it. As rural social capital theories are diverse in definition, IS scholars should critically apply the rural social capital in ICT related study. It is important to shed light on the level of analysis in a study and choose an appropriate rural social capital theory to support the study. It is also critical for researchers conducting ICT-rural social capital research at the both levels to cope with the methodological issues. Although most scholars employ social networks, trust and norm of reciprocity as key dimensions in measuring rural social capital, few of them share same understanding

about other dimensions of it. One may include information and communication (e.g. World Bank) as one of the dimensions of rural social capital, others may consider life satisfaction in their measurement. We argue that when considering the impact of ICT on rural social capital and vice versa at individual level, it is critical to identify the circumstance of the ICT mediated communication, including time, space and other factors, as demonstrated in the study.

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