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Users' Beliefs Toward Technology: A Social Capital Perspective

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USERS' BELIEFS TOWARD TECHNOLOGY: A SOCIAL CAPITAL PERSPECTIVE

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Abstract

IT acceptance is generally considered a mature research field. However, we are persuaded that current approaches are underestimating the importance of social factors and group influence on individual beliefs. This paper adopts a complementary approach to previous researches based on normative assumptions. A social capital perspective is embraced to allow us to focus on the nature and quality of relationship among group members, especially those related to IT adoption. A theoretical model is proposed in order to have a usable theory. Empirically testable propositions are drawn, together with theoretical implications and possible future researches.

Keywords: social capital, users' beliefs, perceptual congruence, technology acceptance.

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1 INTRODUCTION

“There is little doubt that IT can add value to a firm” (Mata et al, 1995). However, the simple introduction of a new technology is not sufficient to achieve a tangible competitive advantage. In fact, end users decide *if* and *how* to use a new technology, hindering or exploiting its potential (Orlikowski, 1992). An extensive body of literature indicates that resistance toward technology obstructs performance improvements tied to IT introduction (Davis, 1989; Venkatesh and Morris, 2000; Venkatesh and Davis, 2000). Hence, the user acceptance of IT represents a critical issue that managers have to take in account during the introduction of a new system.

The wide interest generated by IT acceptance, induced scholars to develop many different models to understand the drivers which affect end users' behaviours. These models explore the IT acceptance from different prospective, deriving their theoretical frameworks from social psychology, sociology, and organizational theories (Davis et al., 1989; Venkatesh and Davis, 2000; Davis et al. 1992; Taylor and Todd, 1995; Thompson et al., 1991; Moore and Benbasat, 1991; Compeau and Higgins, 1995; Venkatesh et al. 2003). Looking at these studies, the importance of social context it is highlighted as fundamental in the development of individuals' behaviour.

In particular, previous research on social factors can be traced back to two different streams: on one hand the normative approach (Venkatesh et al., 2003 for a review), on the other hand the social interaction approach (Rice and Aydin, 1991; Fulk, 1993, Burkhardt and Brass, 1990; Burkhardt, 1994). The normative approach is dominant in the information systems literature (Agarwal, 2000) and it is based upon the “person's perception that most people who are important to her think she should or should not perform the behaviour in question” (Fishbein and Ajzen, 1975). Thus, implicitly, it arises that “social sanction” is the concept through which individuals attitudes and behaviour are influenced (Venkatesh et al., 2003). Otherwise, the social information processing (Salancik and Pfeffer, 1978) states that individuals' beliefs and behaviours are shaped by the social context in which they are embedded. In particular, social information processing is based upon the assumption that the characteristics of a certain situation or object are constructed through social interaction (Salancik and Pfeffer, 1978). Because networks represent the mechanism through which individuals' are proximate to others' information and beliefs, much of empirical evidence of social influence has been studied through this network perspective. For example, Rice and Aydin (1991) argue that proximity has a significant influence on individual perceptions of a new technology. In particular they suggest that relational proximity (in terms of frequency of communication) has the strongest impact on individuals' beliefs. Burkhardt (1994) argues individuals with whom a person interacts directly influence beliefs.

Notwithstanding the important contribution of social interaction and normative approach, many calls have to be addressed concerning the social influence on users' beliefs in organizational contexts. Indeed, these studies consider either the influence of norms or the effects of network structure without considering these aspects simultaneously. Moreover, previous models don't face the quality of the relationship among organizational actors. Quality of relations is seen as a critical determinant of individual actions in organizations, affecting the relationship between objective characteristics of a certain situation and individuals' behaviours (Brief and Weiss, 2002).

Rather than referring to one of the above mentioned approaches, we will adopt a social capital perspective because it allows to consider in a simultaneous fashion the network structure, the social norms and the quality of the network connections (Bolino et al. 2002). Adopting the perspective of

Nahapiet and Ghoshal (1998) we consider the social capital as “the resources embedded within, available through, and derived from the network of relationships possessed by the individual”. In a technologically changing context, individuals are involved to exchange information about the new system. Thus, the way through which individuals exchange resources and information within the social network could influence users’ beliefs toward technology. In particular, we argue that social capital could enhance the individuals’ perceptual congruence toward technology. The purpose of this article is to theoretically explore the role of the three dimensions of social capital (structural, relational and cognitive) highlighted by Nahapiet and Ghoshal (1998) in shaping the perceptual congruence among users’.

The paper aims to provide a new theoretical contribution to the users’ acceptance field. In particular, the focus of this paper is to develop a set of theoretical propositions which could be empirically tested in future researches.

The remainder of this paper is structured as follows. The following section describes the concept of users’ beliefs and the perceptual congruence phenomena. Next, we provide a review of literature in order to support the connection between social capital and users’ beliefs. Moreover, building on the work of Nahapiet and Ghoshal (1998) and Bolino et al. (2002) a theoretical framework is provided. Then, based on the proposed framework, we develop propositions that describe the contribution of the three social capital dimensions to individuals’ deviation from perceptual congruence. Finally, we offer recommendations for future research and potential practical implications.

2 USER BELIEF AND PERCEPTUAL CONGRUENCE

The notion of belief is derived from the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975). The importance of beliefs in the user acceptance field is twofold. On one hand, beliefs are considered the elements able to shape the development of attitude toward an object. On the other hand, beliefs are used to assess individuals’ attitude toward an object. Specifically, within the area of IT acceptance, beliefs are tied to the individual perceptions about the technology characteristic (Lewis et al., 2003).

In the IS field, it is possible to point out that user acceptance and ease of use represent the key beliefs related to usage intention (Venkatesh and Davis, 2000), and system usage (Moore and Benbasat, 1991). Davis (1989) defines perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance”, and the perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort”.

According to Burkhard (1994), social interactions affect the development of individuals’ attitude and behaviours, leading to a perceptual congruence among individuals toward a new technology. Perceptual congruence is defined as “the extent of agreement in perceptions between team members related to any significant organizational phenomenon” (Agarwal, 2000). Some studies highlighted that an homogeneity of variance among group members toward a new technology can be enhanced by the structure of the network (Burkhardt and Brass, 1990), others pointed out that work group behaviours affect individuals’ behaviour toward technology (Fulk,1993). This present study will approach the perceptual congruence of beliefs adopting a social capital perspective. Starting from the assumption of perceptual congruence among group members, we argue that social capital characteristics exhibit significant and differential impact on individual deviation form group beliefs toward a new technology.

3 SOCIAL CAPITAL AND USERS’ BELIEFS TOWARD TECHNOLOGY

Previous research approached social capital at different levels of analysis: as an attribute of nations or geographic regions (Fukuyama 1995), communities (Putnam 1995), individual networks (Burt 1992) and individual actors (Belliveau, O’Reilly & Wade 1996). Lin (2001) defines social capital as

“resources embedded in a social structure that are accessed and/or mobilized in purposive actions”. Focusing on the introduction of a new technology, social capital represents the resources embedded in the social network and related to the system. Individuals develop and exchange these resources through the existing relational ties which connect them one another (Coleman, 1988; Lin, 2001).

Furthermore, according to Nahapiet and Ghoshal (1998), social capital can be considered as a multidimensional construct based on three different aspects which allow the exchange of resources among individuals. First, there is a structural dimension of social capital, which concerns the existence of connections among individuals. Second, it is possible to identify a relational dimension, which refers to the quality of those connections. The third dimension of social capital, called by Nahapiet and Ghoshal “cognitive dimension”, is related to attributes that facilitate the common understanding of the social context.

Building on the work of Nahapiet and Ghoshal (1998) and Bolino et al. (2002), we propose that these three dimensions of social capital at an individual level can affect the users’ tendency to perceptual congruence toward IT. In particular, because the resources exchanged by users about a new technology are related to how the system have to be used and how it can enhance performance, we argue that the three dimensions of social capital affect the perceptual congruence of perceived usefulness and ease of use.

Nevertheless, the exchange of resources among individuals has the aim to gain returns in instrumental action through the adoption of these resources (Lin, 2001). And, during the implementation of a new technology, individuals can use these resources to enhance the process of change or they could use the power of social capital to hinder it (Leana and Van Buren, 1999).

For this reason, we argue that the individuals’ deviation from group beliefs in the context of technological innovation is negatively related to the three dimension of social capital. Figure 1 illustrates this relationship among the three dimension of social capital and the deviation of user’s beliefs. Moreover, our model will consider the effect of subjective norms. In particular, consistently with (Fishbein and Ajzen, 1975) we will distinguish the subjective norm derived from the referent group and the norm connected with the supervisor. Indeed, we argue that subjective norm concerning the referent group has a direct effect on beliefs deviation, while the norm related to the supervisor moderate the impact of the three dimension on individuals’ deviation from group beliefs.

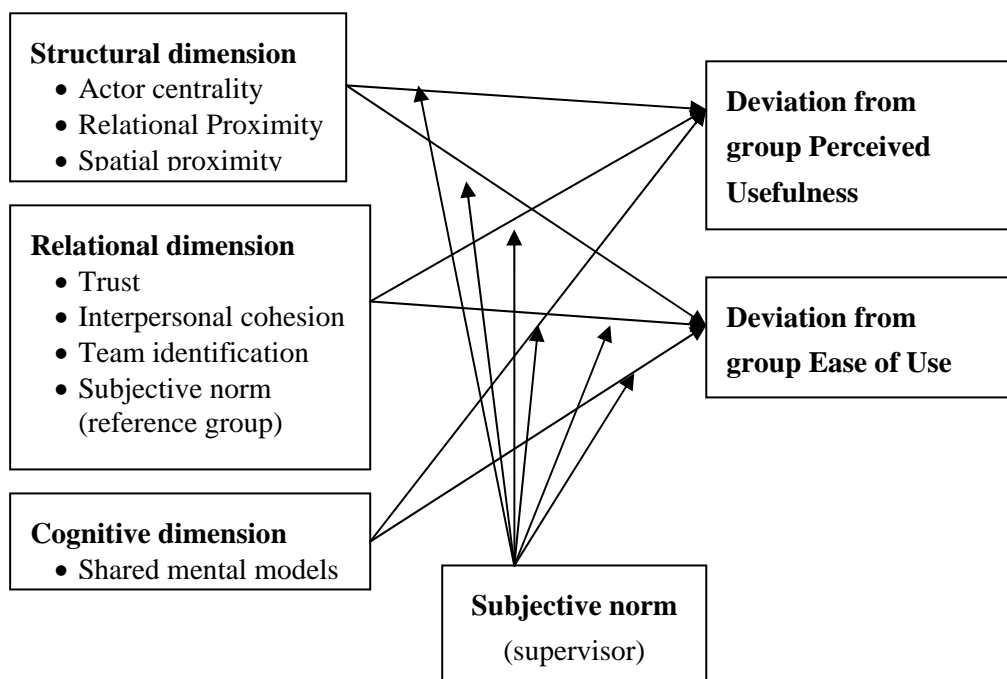


Figure 1: theoretical model

4 STRUCTURAL SOCIAL CAPITAL AND USERS' BELIEFS

The structural dimension of social capital refers to the configuration of the social ties among individuals. It is well established that the structure of the social network is either an enhancer or a constrain for the exchange of resources (Brass, 1984). Indeed, the pattern of these connections can have a significant influence on information transfer (Krackardt, 1992). In the extant literature it is possible to point out different characteristic of network structure which can allow explaining the flow of information and knowledge among actors. In particular, from previous research, the role of structure on information flow has been studied through density, cohesion, centralization, closeness. However, from an individual perspective, it is possible to point out three dimensions particularly indicative of individuals' beliefs shaping: how many ties an individual has to the group (actor centrality), how individuals repeatedly interact with other actors (relational proximity), and how geographically close is the individual to the others (spatial proximity). Hereafter, adopting these characteristics of networks, we will analyze how the structural dimension of social capital affects the deviation of user's beliefs from group beliefs toward technology.

4.1 Actor centrality

Actor centrality refers to the position of a certain actor in the network structure (Wasserman and Faust, 1994) and it captures the individual's potential access to resources. In particular, individuals who present a high level of centrality are those that are extensively involved in relationships with other individuals. In fact, theoretical and empirical research considers the actor centrality as an antecedent of individual embeddedness in the network. An extensive body of literature studied the positive outcomes of actor centrality in terms of power (Brass, 1984), influence in decision making (Friedkin, 1986), and career (Burt, 1992). A central position in the network allows individual to be more visible to the other actors (Wasserman and Faust, 1994). Since individuals' opinions and behaviour are made, maintained and modified through interpersonal processes, an individual with a high centrality is more subjected to the influence of other group members' beliefs (Collins, 1988).

During the introduction of a new technology individuals adopt their channels in order to understand the new functions of a technology and how to manage it. In such situation an actor who has a central position is more exposed to the group's beliefs toward technology. Thus,

PROPOSITION 1: deviation from group beliefs during the introduction of a new technology is negatively related to actor centrality

4.2 Relational proximity

Relational proximity refers to the repeated interaction among individuals in the social network (Rice and Aydin, 1991). The relational proximity assumes that "people are most likely to compare with and come to agree with others to whom they are most strongly tied" (Erickson, 1988). In particular, the more frequent is the use of a connection, the higher is the similarity in technology related behaviours among actors (Rice and Aydin, 1991).

Since social capital refers to the embedded resources exchanged through the network, individuals who frequently exchange those resources with other actors through the network are more likely to present beliefs similar to the group ones. Thus,

PROPOSITION 2: deviation from group beliefs during the introduction of a new technology is negatively related to relational proximity

4.3 Spatial proximity

Spatial proximity refers to the degree to which individuals are in geographical proximity (or dispersion). Hoegl and Proserpio (2004) suggest that group-internal communication is likely facilitated by the close proximity of group members. Moreover, they point out that group members in close vicinity, requires less effort to communicate if compared to circumstances where group members are more dispersed. Furthermore, a decreasing proximity decreases the possibility of spontaneous and/or informal face-to-face communication. Thus, spatial proximity allows individuals to easily exchange resources, and enhances the development of perceptual congruence (Festinger et al.1950). Since that, in a technological change process, individuals tend to exchange their beliefs about technology with proximate actors. Thus,

PROPOSITION 3: deviation from group beliefs during the introduction of a new technology is negatively related to the spatial proximity

5 RELATIONAL SOCIAL CAPITAL AND USER'S BELIEFS

While the structural dimension refers to the presence of connections among individuals, the relational dimension can be traced back to the quality of these relations.

The existence of difficult relations among individuals is an important obstruction for knowledge transfer (Szulanski, 1996). During the introduction of a new technology there is an exchange of beliefs and opinions among group members. Thus, the presence of non arduous relation among members facilitates the communication and the exchange of beliefs. Because beliefs of the referent group exert a profound influence on individuals' psychological evaluation (Agarwal, 2000), we argue that the relational dimension of social capital facilitates the influence process exerted by referents' beliefs. In particular, we argue that constructs related to relational social capital such as trust, interpersonal cohesion, identification and norms (Bolino et al., 1998) enhance the perceptual congruence of beliefs toward a new technology. This argument can be also traced back to Festinger et al (1950), who suggest that the more individuals are strongly tied into the network, the more they are affected by group standards.

5.1 Trust

Trust can be defined as a willingness to be vulnerable to another party (Mayer et al. 1995; Rousseau et al. 1998) and it is based on competence, reliability and openness of the partner, which derive to the evidence drawn from several prior interactions (Whiteneret al. 1998). It is well documented that trust affect satisfaction, performance, and communication (McEvily et al., 2003). In particular, trust can influence organization properties through structuring and mobilizing pathways (McEvily et al. 2003). The structuring pathway concerns the relationship among trust and the social structure. Mobilizing is the process related to the exchange of resources among actors. Many researchers have demonstrated that where the relationships are characterized by high trust, people are more willing to engage in social exchange (Gambetta, 1988; Putnam, 1995). Moreover, trust affects the social exchange both on the sender and on the receiver side (Szulanski, 1996). In particular, in presence of trust the sender will be more inclined to share sensitive information and details. For this reason, in presence of trust during the introduction of a new technology, actors will also share beliefs (positive and negative) concerning the new system. On the receiver side, trust allows to reduce the effort verifying the accuracy and the validity of received information. In the case of a new technology, group members reduce their effort to verify the information and beliefs toward the new system received from other members. In other words, members will be more inclined to accept others' opinion and perception toward a new technology because of the presence of trust. Thus,

PROPOSITION 4: deviation from group beliefs during the introduction of a new technology is negatively related to trust

5.2 Interpersonal cohesion

Group cohesion refers to the degree of which group members desire to remain inside the group itself. (Cartwright, 1968). Several forces play a part in a person's desire to stick with the group, which origins two different kind of cohesion: task-based cohesion and interpersonal cohesion (Zaccaro and Lowe, 1988). Task based cohesion concerns the relationship among group members and a certain task. However, interpersonal cohesion can be traced back to the affective relationship among group members. Many studies point out the positive effect of cohesion on group outcome (Mullen and Copper, 1994 for a literature review). Moreover, it is well established that cohesion has a positive impact on group communication (Hoegl and Gemuenden, 2001). The possibility to exchange more information among members during the introduction of a new technology allows sharing positive or negative beliefs about the new systems. Thus,

PROPOSITION 5: deviation from group beliefs during the introduction of a new technology is negatively related to interpersonal cohesion

5.3 Identification

Identification is the process through which individuals perceive themselves to be members of the same social category (Tajfel, 1982). Many researchers point out that group behaviour can be seen as causally dependent on the functioning of such shared social identification (Turner, 1982). Previous researches argue that a lack of group identity has negative effect on information sharing (Nahapiet and Ghoshal, 1998). Moreover, communication and cooperation among members is positively associated to the level of group identification (Campion et al., 1996). Other studies highlight the negative effects related to group identification. In particular, in presence of identification, intragroup similarity tends to be enhanced: self and others are evaluated favourably in terms of common group membership even when own and other's individual behaviours were detrimental to the group outcomes (Turner, 1982). Even if the impact of group identity on group performance is controversial, it is well established that high levels of identification bring to uniformities in intragroup opinions and behaviours (Turner, 1982). Thus,

PROPOSITION 6: deviation from group beliefs during the introduction of a new technology is negatively related to group identification

5.4 Subjective norm (referent group)

“The subjective norm is the person's perception that most people who are important to him think he should or should not perform the behaviour in question” (Fishbein and Ajzen, 1975). Consistently to an example made by Fishbein and Ajzen, in an organizational setting it is possible to trace back the concept of “important people” to the supervisor and the referent group. Thus, we will distinguish the subjective norm derived from supervisor and referent group. In particular, the role of subjective norm related to the supervisor is discussed later because we argue a moderating effect of such construct on our main relations.

Nahapiet and Ghoshal (1998) point out that norms could represent a simple form of social capital. However, they recognize that norms can have either a positive or negative effect on outcome. In the user acceptance field, this argument is implicitly assumed by Venkatesh and Davis (2000) who argue that when a co-worker think that the system is useful, a person tend to have the same idea. However, Venkatesh and Davis (2000) don't point out the dark side of this situation. In fact, it could happen that the reference group share the common belief of system uselessness, influencing individuals' belief in

an opposite manner. Thus we argue that norms related to the reference group enhance the tendency of individuals to group conformity. Formally,

PROPOSITION 7: deviation from group beliefs during the introduction of a new technology is negatively related to subjective norms connected to the referent group

6 COGNITIVE SOCIAL CAPITAL AND USER'S BELIEFS

The cognitive aspect of social capital refers to the existence of shared mental models among individuals. In particular, they describe the extent to which individuals understand one another (Bolino et al, 2002). Shared mental models represent a social construction of a certain situation. Extant literature studied the positive effects of group shared mental models on effectiveness (Levine and Moreland, 1991; Weick and Roberts, 1993) and on value creation (Tsai and Goshal, 1998). However, shared mental models can have negative effects on decision processes (Janis, 1982).

6.1 Shared mental models

The presence of a shared language it is a necessary condition to enhance the exchange process among individuals (Bolino et al, 2002, Nahapiet and Ghoshal, 1998). The existence of a shared language, allows individuals to easily transfer information and share knowledge (Druskat and Pescosolido, 2002 Levesque, et al. 2002). The ability to easily exchange information among members during the introduction of a new technology allows to share positive or negative beliefs about the new system.

Moreover, the presence of a common language it is the base for the creation of categories through which observe and interpret the organizational context. However social categorization is useful to simplify and reduce the complexity of the environment, it could be also a way to enhance the differentiation among groups (Brown, 2000). In this way, a shared vocabulary in the group enhances the mutual understanding among group members but reduces the effective sharing of information with individuals' of the out-group (Brown, 2000).

During the introduction of a new technology, individuals who perceive a great similarity of vision within their group will tend to exchange information with the in-group members. For this reason they will have the propensity to conform their beliefs about technology to the group beliefs. Thus,

PROPOSITION 8: deviation from group beliefs during the introduction of a new technology is negatively related to shared mental models

7 THE MODERATING ROLE OF SUBJECTIVE NORM (SUPERVISOR)

Adapting the previous definition, the subjective norm referred to the supervisor pressure can be labelled as the individual perception of supervisor pressure to perform or not perform certain behaviour. Despite we stated that subjective norm derived from group pressure has a direct influence on deviation from group beliefs, we argue that the pressure exerted by the supervisor moderates the effects of each social capital dimension on individuals' deviation from perceptual congruence.

In particular, we argue that an individuals' who perceive a great pressure form the supervisor is less influenced by the group beliefs and behaviours.

PROPOSITION 9: The negative effect of the three dimension of social capital on individual deviation from group beliefs will attenuate with increased subjective norm

8 CONCLUSION

However computer acceptance is considered a mature research field (Venkatesh et al. 2003), in this paper we attempted to analyze it from a new perspective. In order to shed some light on the users' belief toward a new technology we adopt a complementary approach to previous researches based on networks or normative assumptions. A social capital perspective allow us to focus on the nature and quality of relationship among group members.

Consistently with Nahapiet and Ghoshal (1998) social capital may have either positive or negative consequences. With this paper we suggest that the three dimensions of social capital enhance the perceptual congruence of users' beliefs. However, a high level of perceptual congruence may have positive effect if individuals develop the tendency to have positive beliefs toward the new technology, while it could have negative effect because group members are oriented to build up common negative beliefs. For this reason, an high level of social capital may either catalyze the technological change or constrain the adoption process of a new technology.

Moreover, social capital represents a form of investment for the firm. For this reason, an institutional effort is needed to gain advantages form the investment in social capital development. During the introduction of a new technology, firms have to concentrate their effort to create, develop and maintain those relationships which lead to the exploitation of social capital and IT investments potential.

Furthermore, if the propositions offered here are supported empirically, some important practical implications will emerge for firms that are going to introduce a new information system. In fact, implementation of a new technology is not only related to technical or project management issues, but also to social aspect that involves users'. In particular, management has to monitor and take in account *rumours* related to the new technology in order to isolate a possible negative domino effect. On the other side, managers have to be able to make leverage on those dimensions of social capital which enhance the development of positive beliefs toward technology. In fact, as suggested by Bolino et al. (2002) those firms developing a particular configuration of social capital are likely to be more successful.

Future research should focus on the empirical validation of the derived propositions and should discriminate among different type of technology and organizational settings. For example, it would be interesting to test the validity of this model in a context characterized by high or low geographical proximity (in which the users' communicate through CMC Computer Mediated Communication applications). Moreover, it would be interesting to analyze which kind of social capital characteristics enhance the development of positive beliefs among members, and which features improve negative beliefs toward technology.

Furthermore, since previous studies pointed out the relevance of individual factors on users' acceptance of technology (Venkatesh and Davis, 1996; Lewis et al, 2003), the empirical validation of this theoretical model should control the effects of social capital through the inclusion of individual factors.

Moreover, it would be interesting to test this theoretical though a longitudinal study. We argue that the influence of social capital would decrease overtime because individual should develop their own experiences toward technology building up descriptive beliefs (Fishbein and Ajzen, 1975).

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