

2006

# Individual attitude toward improvisation in information systems development: a multi-level perspective

Magni Massimo

*Universita Bocconi*, emme.magni@uni-bocconi.it

Bernardino Provera

bernardino.provera@unibocconi.it

L. Prosperio

luigi.proserpio@unibocconi.it

Follow this and additional works at: <http://aisel.aisnet.org/ecis2006>

---

## Recommended Citation

Massimo, Magni; Provera, Bernardino; and Prosperio, L., "Individual attitude toward improvisation in information systems development: a multi-level perspective" (2006). *ECIS 2006 Proceedings*. 128.

<http://aisel.aisnet.org/ecis2006/128>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2006 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# INDIVIDUAL ATTITUDE TOWARD IMPROVISATION IN INFORMATION SYSTEMS DEVELOPMENT: A MULTI-LEVEL PERSPECTIVE

Massimo Magni, Bocconi University, Institute of Organization and Information Systems, and SDA Bocconi School of Management, Viale Isonzo 23, 20135 Milan, Italy, [emme.magni@uni-bocconi.it](mailto:emme.magni@uni-bocconi.it).

Bernardino Provera, Bocconi University, Institute of Organization and Information Systems, and SDA Bocconi School of Management, Viale Isonzo 23, 20135 Milano, Italy, [bernardino.provera@unibocconi.it](mailto:bernardino.provera@unibocconi.it).

Luigi Proserpio, Bocconi University, Institute of Organization and Information Systems, and SDA Bocconi School of Management, viale Isonzo 23, 20135 Milano, Italy, [luigi.proserpio@unibocconi.it](mailto:luigi.proserpio@unibocconi.it).

## Abstract

*Improvisation is rapidly becoming an important issue for both scholars and practitioners. Organizations that operate in turbulent environments must learn to swiftly adapt and respond to such instability, especially in areas as innovation and new product development. In such contexts traditional top-down, carefully-planned approaches to innovative projects may represent an obstacle to effectively dealing with environment uncertainty. Prior research on improvisation has focused considerable attention on the centrality of improvisation in individual and group outcomes, while less emphasis has been placed on how individual attitude toward improvisation is formed. In an attempt to fill this gap, we will theoretically analyze the antecedents of individual attitude toward improvisation, by looking at the Information Systems Development (ISD) domain. In particular, the outcome of this paper is the development of theoretical propositions which could be empirically tested in future research.*

Keywords: Improvisation, Information Systems Development, Individual Attitude.

# 1 INTRODUCTION

Improvisation has become an important issue for both scholars and practitioners. Organizations operating in turbulent environments must learn to swiftly adapt and respond to them, especially in areas as innovation and new product development (Brown & Eisenhardt, 1997; Kamoche & Pina e Cunha, 2001). In such contexts traditional top-down, carefully-planned approaches to innovative projects may represent an obstacle to effectively dealing with environment uncertainty (Kamoche et al., 2001). Indeed, improvisation may enable managers to continuously adjust to change through a creative process developing novel and useful solutions (Crossan, Pina e Cunha, Vera, & Cunha, 2005).

Improvisation has been studied in domains as different as organizational learning (Miner, Bassoff, & Moorman, 2001) technology implementation (Orlikowski & Hofman, 1997), and new product development (Kamoche et al., 2001). Research has addressed the issue of improvisation at different levels of analysis: individual, group, and organization (Moorman & Miner, 1998). Similar, multi-level approaches have been applied to investigate the dynamics of improvisation-related concepts as creativity and innovation. However, differently from research on creativity and innovation, research on improvisation is still at an immature stage (Kamoche et al., 2001). First, studies on improvisation suffer from an over-reliance on the use of metaphors as jazz music, theatre, sports, and public speaking (Pina e Cunha, Vieira da Cunha, & Kamoche, 1999). This view tends to obscure the notion that “improvisation is more than a metaphor” (Crossan, 1998). A key challenge for future research is to go beyond the metaphorical conceptualization of improvisation, to provide theoretical insights grounded in business organizations. Second, prior research has focused considerable attention on the centrality of improvisation in individual and group outcomes (Kamoche et al., 2001), while less emphasis has been placed on how individual attitude toward improvisation is formed.

In order to address these two issues, that have not been exhaustively developed by previous studies, we will theoretically analyze the antecedents of individual attitude toward improvisation by looking at the Information System Development (ISD) domain. In particular, following the suggestions put forward by Orlikowski (1997), we focus on open-ended, customizable technologies which are related to complex organizational changes.

By relying on the organizational theory of improvisation, the aim of this paper is to provide a theoretical contribution to the IS field by developing a theoretical framework on the antecedents of individual attitude to improvise in the ISD. In particular, the outcome of this paper is the development 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 improvisation, underscoring its overall characteristics, as well as the peculiarities in the ISD domain. Building on improvisation theory, we next develop a theoretical framework and propositions that describe how the individual, social, and organizational dimensions affect individual attitude toward improvisation. Finally, we offer recommendations for future research in both the ISD and improvisation domains.

## **2 THE CONCEPT OF IMPROVISATION IN ORGANIZATIONS**

### **2.1 Definition**

Improvisation has been defined as a form of intuition which guides action in a spontaneous way (Crossan & Sorrenti, 1997), or as “the conception of action as it unfolds – acting without the benefit of elaborate prior planning” (Kamoche et al., 2001: 735), and “drawing on available cognitive, affective, social and material resources (Kamoche, Pina e Cunha & Vieira da Cunha, 2003). Improvisation can be regarded as “the deliberate and substantive fusion of the design and execution of a novel production” (Miner et al., 2001). Furthermore, Moorman and Miner define it as “the degree to which composition and execution converge in time”.

These definitions essentially focus on the temporal sequence of two distinct activities, planning and acting, and on the need to react to particular stimuli by relying on immediately-available resources. The latter aspect of improvisation is often referred to as the “*bricolage*” component (Pina e Cunha et al., 1999). Temporal pressure, originated by either internal or external sources, is regarded as a key condition reducing the distance between planning and acting, thereby increasing the chance of improvisational activities (Pina e Cunha et al., 1999). Other significant conditions include fortuity, complexity and uncertainty (Weick, 1998).

### **2.2 Characteristics of Improvisation**

Organizational improvisation can be deliberate or extemporaneous (Pina e Cunha et al., 1999). Moreover, it should not necessarily be regarded as the result of stand-alone events as organizational crises (Vera & Crossan, 2004). On the contrary, improvisation is thought to occur along a continuum between totally planned action and spur-of-the moment activities (Pina e Cunha et al., 1999). Accordingly, individuals and groups may improvise to incremental and radical degrees, by adjusting to current procedures as well as by swiftly responding to dramatic crisis events (Vera & Crossan, 2004).

Managerial studies suffer from a dominant bias according to which innovation and, ultimately, competitive advantages are the results of carefully-planned actions and uncertainty avoidance (Kamoche et al., 2001; Mintzberg, 1994; Weick, 1998). Organizations develop routines that yield activities and solutions learned from past experience. Routines embody ordinary learning. In some occasions, though, routines perpetuate the same response to different stimuli (Weick, 1991) and organizations tend to fall into competency traps (Levitt & March, 1988). As a consequence, learning is hampered. Moreover, reliance on successful past experience lead organizations to regard improvised outcomes as misgivings to be avoided and, if detected, punished. If improvisation is regarded as utterly unacceptable, though, organizational members will hardly engage in creative endeavours that could result in significant innovations.

On the contrary, organizations must develop their abilities to improvise to cope with tumultuous external conditions (Vera & Crossan, 2004), attempting to continuously and creatively change in order to move product and services out the door (Brown et al., 1997). Therefore, improvisation is a creative process that aims at developing novel and useful solutions to a particular situation (Crossan et al., 2005).

### **2.3 Improvisation and ISD**

In the XXI century, organizations are making significant investments in highly-complex technologies to develop information systems for integrating data and developing knowledge (e.g., knowledge management, peer-to-peer collaboration), as well as to cope with new problem domains (e.g., reverse logistics in supply chains). Given the complexity of these new technologies, returns on IT investment are often constrained by a poor process in the development and implementation of these systems into the organizational environment (Lewis, Agarwal, & Sambamurthy, 2003). ISD refers to the “analysis, design, and implementation of IS

applications/systems to support business activities in an organizational context” (Xia & Lee, 2005). As noted by Avison & Fitzgerald (1999), the dominant approaches to the ISD have focused on the identification of phases, allowing a better management and control during the whole development project. Such approaches are based upon the principle of functional decomposition, that is, the breaking down of a complex problem into more manageable units in a disciplined way. However, the attempt to bring some discipline to the development of an IS has often brought to the failure of ISD projects (Jesitus, 1997), and a negative impact on user acceptance (Agarwal, 2000) and productivity (Lewis, Agarwal, & Sambamurthy, 2003). In fact, the rapidly changing environment of today leads developers to cope with both technological issues and organizational factors which are outside of the project team's control (Kirsch, 1996; Schmidt & Lyytinen, 2001). Therefore, because of the complexity of designing and introducing an IS in an organization, the a priori establishment of all encompassing requirements is unfeasible (Orlikowski & Hofman., 1997). In fact, the development of a new information system through functional decomposition methods, with the system requirements closed early in the process, constrains the rise of emergent behaviours (Truex, Baskerville, & Travis, 2000).

Information systems cannot be considered as stable and discrete entities, as they belong to “information infrastructures” which constantly change and adapt (Ciborra, 1999). Therefore, information systems require a high degree of unplanned action by organizational actors. Basic requirements are established a priori, but the success in the development of the system derives from the ability to fulfil the emergent requests for customization. In fact, according to Orlikowski and Hofman (1997) and Cooper et al. (2000) there should be a continuous process of alignment between the technological change and the organizational factors involved in the change process.

### **3 THE CONCEPT OF INDIVIDUAL ATTITUDE**

The proliferation of articles, chapters, and books about attitudes underscores the importance growth of this concept (Ajzen, 2001 for a literature review). According to Fishbein and Ajzen (1975), attitude can be defined as a predisposition to respond in a consistently favourable or unfavourable manner with respect to a given psychological object. The importance of individual attitude can be traced back to its ability to predispose individual to action (Ajzen, 2001). Many models have been developed in order to explore the relationship between attitude and individual action in different domains, such as social psychology, sociology and organization. Besides these disciplines, the concept of attitude received a significant interest in the information system domain, with a particular focus on individual use of IT (i.e. Venkatesh and Davis, 2000).

Therefore, since attitude’s stability for representing individual predisposition to perform a behavior, it could be also adopted to understand individual’s tendency to improvise. According to the definition of attitude, and reframing it into the improvisation domain, we define the attitude toward improvisation as the individual predisposition to take improvise action.

A critical issue can be traced back to the formation of individual attitude toward improvisation. Previous literature points out that the development of a person’s attitude is related to the formation of a set of individual’s beliefs about a particular object, action, or event. According to Ajzen (2001) “each belief associates the object with a certain attribute, and a person’s overall attitude toward an object is determined by the subjective values of the object’s attributes in interaction with the strength of the associations”. Many studies in the information systems domain have underscored the relationship between beliefs and attitude, pointing out that beliefs are related to different aspects and psychological levels (see Lewis et al., 2003). In fact, each belief may refer to the individual herself, to the group characteristics she belongs to, and to the organizational environment in which she is involved.

## 4 THE ANTECEDENTS OF INDIVIDUAL ATTITUDE TOWARD IMPROVISATION: A MULTI-LEVEL MODEL

Extant theoretical literature points out that organizational improvisation relies on factors related to the individual, group and organizational level (Crossan et al., 2005; Moorman & Miner, 1998; Vera & Crossan, 2005). Drawing on previous theoretical literature, we propose the following research framework of individual attitude toward improvisation in the IS development domain (figure 1).

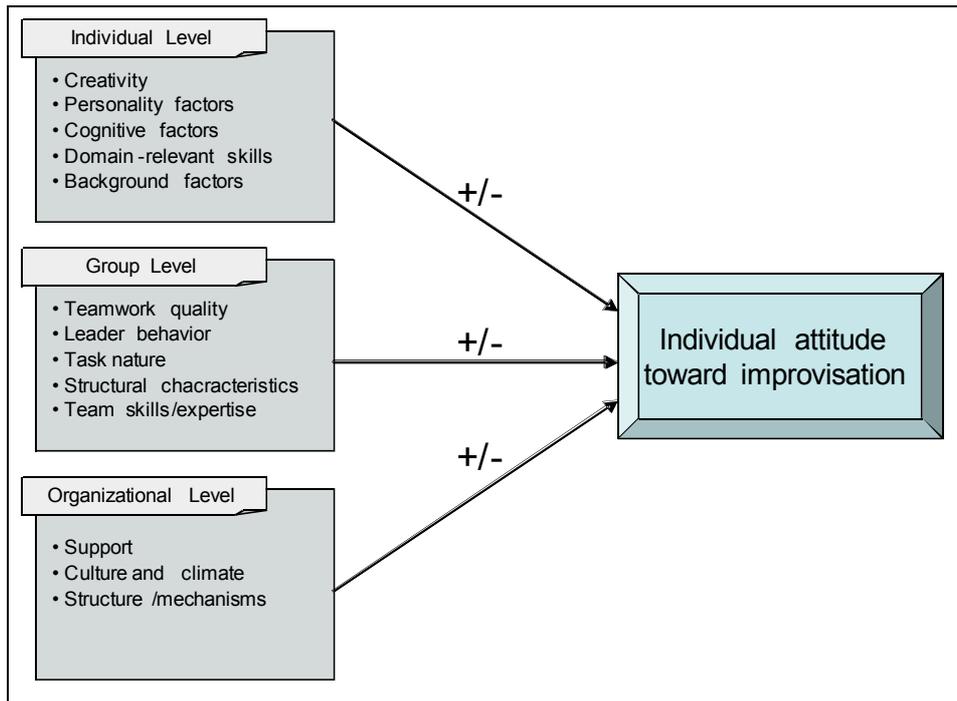


Figure 1: Research framework.

### 4.1 Individual level

Individual factors influencing improvisational behaviours range from personality traits to cognitive issues. Developer's technical cognizance and a good comprehension of the environment in which the system should be implemented could facilitate the effectiveness of improvisation. Moreover, improvisation could lead to new and useful ideas through individual's creative behaviours (Amabile, 1988) which facilitate the generation of a greater number of potential solutions. Consequently, individual characteristics may have a significant effect on improvisational behaviour in organizations (Orlikowski & Hofman, 1997; Pina e Cunha et al., 1999). Relevant factors at the individual level include creativity, personality and cognitive traits, domain-relevant skills, and background factors.

Creativity. A recurrent parallel is often drawn between the notion of improvisation and that of creativity. Albeit the two concepts are generally held as distinct (Pina e Cunha et al., 1999), improvisation has been defined as a creative process (Vera & Crossan, 2005), in which the focus is on how organizational actors attempt to orient themselves to, and take creative action in, situations and events that are complex, ambiguous, and ill defined. Consequently, we hold

that individual who perceive themselves as creative may be more likely to engage in improvisational behaviors. Given that in complex project of ISD it is impractical to a priori define all the necessary requirements (Orlikowski & Hofman, 1997), developers who are more creative should be more likely to develop solutions by relying on a small set of information. Thus:

*PROPOSITION 1: Individual creativity is an antecedent of individual's attitude toward improvisation during complex ISD projects.*

Personality Factors. "Personality factors represent individual characteristics which are likely to be stable overtime" (Woodman, Sawyer, & Griffin, 1993). According to Amabile (1997), individual characteristics such as persistence, curiosity, energy, intellectual honesty, internal locus of control may affect individual attitude to behave in a spontaneous fashion. Another important issue related to the personality traits can be traced back to the concept of self-monitoring. This represents the propensity to adapt one's behaviour to social cues, using others' behaviours as a guide for expressing oneself (Snyder, 1974). Relying on the information from social cues, individuals with a high level of self-monitoring are more likely to interpret the dynamics of environment (Caldwell & O'Reilly, 1982) and to disconnect from routinized behaviour. In the ISD domain, if an individual is able to understand the complex environment in which the system is going to be designed and implemented, he or she will be able to recombine the system requirements without following a routinized path. Therefore, we posit the following:

*PROPOSITION 2: Personality factors are antecedents of individual's attitude toward improvisation during complex ISD projects.*

Cognitive Factors. According to Woodman et al. (1993), the ability of individuals to produce ideas is also related to the individual cognitive processes. For example, the characteristic of "field independence" refers to the ability of an individual to focus on relevant aspects of a certain situation, ignoring irrelevant issues (Woodman et al., 1993). Therefore, an individual with high field independence is more likely to take spontaneous action because he or she does not have difficulty in separating important aspects from less important ones. Another central cognitive aspect which may influence the individual attitude toward improvisation can be traced to the concept of self-efficacy. Self-efficacy refers to judgments of what one can do with whatever skills one possesses. Individuals with a low level of self-efficacy are more likely to follow instructions and directions more carefully (Marakas, Yi, & Johnson, 1998). Therefore, individuals with a high degree of confidence in their ability to exploit their skills will be less likely to follow standard procedures in the development of the system, experimenting with new pathways and behaving in a spontaneous fashion. Therefore,

*PROPOSITION 3: Cognitive factors are antecedents of individual's attitude toward improvisation during complex ISD projects.*

Domain-relevant skills. Domain-relevant skills form the set of cognitive pathways that are followed to solve a given problem or complete a given task (Amabile, 1997). Domain-relevant skills can be considered as the raw materials that individuals can use for improvising. Therefore, a great number of skills implies a high number of potential alternatives that can be generated by the individual (Amabile, 1988) when improvisation is needed. Kamoche and Pina e Cunha (2001) underscore this aspect by pointing out that "it's impossible to improvise on nothing". Individuals with high knowledge of a certain product or process are more likely to recombine materials/tools to develop new solutions (Lovell & Kluger, 1995). Connected to this aspect,

Kamoche and Pina e Cunha (2001) affirm that training represents an important aspect in order to develop the knowledge about the process or product. Therefore, by leveraging on the creation of expertise, training allows individuals to rely more on intuition rather than on planning. In fact, the development of strong expertise allows individuals to spontaneously decide what to do, rather than to think consciously about action (Crossan, 1998). By developing a more extensive set of skills in the ISD domain, employees should be more comfortable in trying new things, as well as be more aware of different alternatives and opportunities, even if they are involved in a complex ISD project (Shalley & Gilson, 2004). Thus:

*PROPOSITION 4: Domain-relevant skills are antecedents of individual's attitude toward improvisation during complex ISD projects.*

Background factors. Individual behaviour within organizations may depend upon factors as organizational position and tenure. A higher position within an organization, as well as a longer tenure, may increase legitimization and authority. Consequently, we hold that individuals may feel more legitimized to act outside the tight boundaries of predefined tasks and procedures, thereby engaging more easily and proactively in improvisational behaviour. Thus:

*PROPOSITION 5: Background factors are antecedents of individual's attitude toward improvisation during complex ISD projects.*

## **4.2 Group level**

Besides personal characteristics, individuals are immersed in an organizational environment which may facilitate or constrain the improvisational process (Vera & Crossan, 2004). Numerous studies pointed out the influence of team dynamics, structure and resources may influence the organizational improvisation (Vera & Crossan, 2004) In fact, according to Nemeth & Staw (1989) several attitudes are socially constructed. Hereafter, according to our multilevel model, we present the main team level factors which may influence the individual attitude to improvise. These include teamwork quality, leadership behaviour, the nature of the task, structural characteristics, and team expertise.

Teamwork quality. Teamwork quality refers to the degree of collaboration among team members (Hoegl & Gemuenden, 2001). The way through which team members cooperate allows managing the interdependencies more effectively. This aspect has been underscored by Faraj and Sproull (2000), who posit that difficulties in managing team process for knowledge flow may hinder project outcomes. For example, a good quality in the communication process allows exchanging information more effectively, helping individuals to get the right information in a short time frame. Moreover, the presence of mutual support is an important issue in order to avoid the interpersonal conflict among members. The lack of conflict allows individuals to cooperate to achieve common goals (Tjosvold, 1984). The existence of mutual support allows team members to rely on one another when they are facing with an unexpected situation. Another important issue is existence of trust among members (Vera & Crossan, 2004). Trust can be considered as “the extent to which a person is confident in, and willing to act on the basis of, the words, actions, and decisions of another” (McAllister, 1995). On the receiver side, trust allows to reduce the effort verifying the accuracy and the validity of received information. In other words, members will be more likely to accept other members' information because of the presence of trust. Therefore, according to Vera and Crossan (2004), a lack of trust and dysfunctional interaction among members brings individual to not have access to the material needed for improvise, decreasing their attitude to perform spontaneous actions. The lack of teamwork in an ISD project constrains the flow of information among members about the

emergent requirements defined by users, increasing the risk of taking a spontaneous action. Consequently, we argue the following:

*PROPOSITION 6: Teamwork quality is an antecedent of individual's attitude toward improvisation during complex ISD projects .*

Leadership behaviour. It is generally acknowledged that leaders' behaviour affects the attitudes and behaviours of employees. We consider the supervisor's behaviour as a group-level construct as we assume that members belonging to the same group are likely to be exposed to the influence of the same supervisor, involving a relatively homogeneous experience that is distinct from those of other groups (Liao & Chuang, 2004).

Given the complexity of ISD projects, leaders cannot rely on predefined structures but he/she should be able to provide support in situations where there are no clear directions (Mumford, Scott, Gaddis, & Strange, 2002). The importance of leader support in conditions of uncertainty has been pointed out by many studies (Amabile, Schatzel, Moneta, & Kramer, 2004). Since the improvisation process involves trial and error and discovery, leader's behaviour should be consistent with this approach. Given the domain associated with improvisation process, leaders should be able to provide the necessary resources which could help the individual to improvise. In an ISD environment characterized by uncertainty and unclear solutions, leaders who offer a certain degree of freedom to their employees may provide a fertile ground for spontaneous actions (Mumford et al., 2002). Therefore:

*PROPOSITION 7: Leadership behaviours is an antecedent of individual's attitude toward improvisation during complex ISD projects.*

Task nature. The nature and texture of the task individuals have to perform affects the likeliness of engaging in improvisational activities (Orlikowski, 1996; Vera & Crossan, 2005). ISD projects that refer to broadly-defined, open-ended tasks allowing for flexible adaptation and customization, are more likely to spur improvisational behaviour. On the contrary, if tasks are routinized via rigid procedures, individuals may choose to trace unanticipated events to known procedures, rather than improvise novel solutions (Pina e Cunha et al., 1999). Moreover, time pressure may spur improvisation, as individuals facing unanticipated and emerging challenges ineffectively tackled via known procedures struggle to meet deadlines by improvising alternative solutions. Thus:

*PROPOSITION 8: Task nature is an antecedent of individual's attitude toward improvisation during complex ISD projects.*

Structural characteristics. Although empirical evidence on the influence of group composition on members' outcomes is not entirely conclusive, a number of recent studies find a positive relationship between group diversity and innovative behaviours (Ancona & Caldwell, 1992). Group composition is a multifaceted construct referring to the degree to which individuals within a group represent different characteristics related to background, age, gender, and so on. Some researchers suggested that group diversity might increase the attitude of individuals to try out new pathways (Amabile, 1988), based upon the assumption that individuals who belong to non-homogeneous groups are likely to be influenced by the different perspectives of the other members (Ancona et al., 1992; Pelled, 1996). The empirical evidence of the diversity in team composition has been pointed out also in the information systems domain (Karahanna, Evaristo, & Srite, 2005). In fact, leveraging on the "value in diversity", team composition

stimulates individual in the attempt to find non obvious alternatives (Shalley et al., 2004). Moreover, other studies point out group size as a further aspect related to the structural characteristics. Group size has been considered by researchers as a critical issue related to group activities and outcome (Campion, Papper, & Medsker, 1996). We argue that group size represents the number of potential sources of information and stimuli within the team, leveraging on individuals' different knowledge and experience on ISD projects. Therefore, we predict the following:

*PROPOSITION 9: Structural characteristics are antecedents of individual's attitude toward improvisation.*

Team skills and expertise. Besides a good coordination among team members, it is necessary that the team possesses a wide set of skills and expertise in order to allow the individuals to feel comfortable to improvise. In the ISD, according to Faraj and Sproull (2000) expertise represents one of the most critical resources for project effectiveness. Moreover, expertise has a positive impact on individual improvisational process because "the larger the set of skills in a work team, the more numerous are the alternatives for developing new combination of ideas" (Vera & Crossan, 2004). Another important issue related to the knowledge within the team relies on the transactive memory. In fact, transactive memory which allows team members to encode, store, and retrieve relevant related to previous experiences (Liang, Moreland, & Argote, 1995). During the development of a complex information system, the access to diverse memory resources helps individuals improvise, by leveraging on the recombination of past team experience (Vera & Crossan, 2004) in order to face the paucity of requirements that are defined *a priori*. Thus:

*PROPOSITION 10: Team skills and expertise are antecedents of individual's attitude toward improvisation during complex ISD projects.*

### **4.3 Organizational level**

Organizational factors may represent a facilitating condition for improvisational process (Vera & Crossan, 2004), enhancing individual attitude toward improvisation. Recalling the theories of improvisation, many authors pointed out the influence of the organizational environment on the improvisation process and outcome (Kamoche et al., 2001; Vera & Crossan, 2004). Following this theoretical background we point out the main organizational variables which can affect individual attitude to improvise. These include organizational support, culture and climate, structures and control mechanisms

Organizational support. The concept of organizational support can be traced back to the "employees' perception about the extent to which the organization cares about their well being" (Eisenberger, Fasolo, & Davis-LaMastro, 1990). In the IS domain, Igarria, Guimaraes, & Davis (1995) underscore the importance of top management support which refers to the allocation of sufficient resources and to the encouragement Igarria et al. (1995). George and Brief (1992) suggest that organizational support is positively related to employees' effort. In particular, employees who perceive that the organization recognizes and rewards their effort to carry out their job effectively are more likely to perform behaviours which go beyond their formal duties. Therefore, if individuals in ISD projects perceive that they are supported by the organization through enough resources, they may be more likely to break routines and to engage improvisational behaviours. Consequently:

*PROPOSITION 11: Organizational support is an antecedent of individual's attitude toward improvisation during complex ISD projects.*

Organizational culture and climate. Hierarchical organizations permeated by authority relations and rigidly-controlled workplaces are expected to obstruct improvisational behaviour (Orlikowski, 1996). On the contrary, experimental cultures rewarding exploration and creativity, and tolerating mistakes, are expected to foster improvisation (Pina e Cunha et al., 1999; Vera & Crossan, 2005). When errors are regarded as viable sources of learning, and the ideas of others are not blocked, but encouraged and freely discussed, improvisational activities within individuals and groups are free to emerge and be evaluated. Thus:

*PROPOSITION 12: Organizational culture and climate are antecedents of individual's attitude toward improvisation during complex ISD projects.*

Organizational structure and control mechanisms. Organizational properties like evaluation criteria and reward systems significantly affect the likeliness of adopting improvisational behaviour (Orlikowski, 1996). Evaluation systems strictly rewarding the accomplishment of predefined milestones and objectives may constrain improvisational activities. On the contrary, systems that reward exploration, by focusing on individual attempts to produce viable solutions, are expected to encourage improvisational behaviours (Orlikowski & Hofman, 1997). Therefore:

*PROPOSITION 13: Organizational structure and mechanisms are antecedents of individual's attitude toward improvisation during complex ISD projects.*

## **5 CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS**

### **5.1 Theoretical and managerial implications**

The present study has provided a set of theoretical propositions to be validated and tested in empirical researches. The ability to manage improvisation is a critical determinant for organizations to control, at least to a certain extent, the emergent and unpredictable part of their everyday actions, as well as the manifestation of fortuitous events (Pina e Cunha et al., 1999). Consequently, understanding the antecedents which lead to improvisation is crucial in order to fully grasp how “emergent strategies”(Mintzberg, 1994; Weick, 1998) unfold and relate to structured planning. Increased awareness of the potential of improvisational activities may help organizations avoid dismissing improvisation as a dysfunction, resulting from unintended processes and design failure (Lewin, 1998; Vera & Crossan, 2004).

Organizations should consider improvisation as a potentially effective skill and tool “(...) that complements planning efforts, but that, because of its creative and spontaneous nature, it is not necessarily tied to success, the same way planning is not necessarily associated with success” (Vera & Crossan, 2004).

Besides implication for theory building and formulation, mastering the dynamics of improvisation has direct relevance for practitioners (Vera & Crossan, 2005). At the top management level, executives may increase their capability to flexibly enact business plans, by understanding when, and how, emergent factors may cause their organization to deviate from pre-planned action and, consequently, adopt improvisational behaviours. Moreover, team leaders and project managers may benefit from understanding the micro-processes of improvisation, as they gain a better understanding of the situations in which individuals engage in unanticipated activities. Overall, managers may learn to leverage improvisation by defining the boundaries and constraints within which organizational actors and units are free to experiment and engage in risk-taking actions (Vera & Crossan, 2005).

Moreover, if the propositions offered here are supported empirically, some important practical implication may rise for ISD domain. First of all, this paper offer a more structured perspective for helping firms for looking through a new perspective the ISD. This aspect is consistent with the assumption made by Ciborra (1999) who argues that in order to improve the effectiveness of IT in organisations, “(...) due consideration for the role played by improvisation in human affairs advises us to stay more attached to those everyday micro-practices and means developed by mankind over the centuries to survive”. Connected to this perspective, the present study can offer another important trigger in order refocus the alignment between the need required by an ISD project and the capabilities of individuals involved in the project team. In fact, besides the focus on project management and technical skills, individuals should have some peculiar characteristics which allow them to improvise in an uncertain environment.

Furthermore, the ability of the group and the firm to facilitate the emergence of improvising behaviour could represent also a critical aspect in the relationship between team members and final users. In fact, developers who have an attitude toward improvisation are more able to understand and grasp the emergent signals and requests from users. The ability to fulfil users’ emergent requests may allow a more effective involvement of users with a consequent enhancement of their satisfaction using the system (Agarwal, 2000).

## 5.2 Future research directions

The importance of carrying out thorough empirical investigation is highlighted by the consideration that improvisation is not an inherently positive or negative phenomenon (Crossan et al., 2005; Miner et al., 2001). Positive outcomes of improvisation include flexibility, learning, motivation, and affectivity (Pina e Cunha et al., 1999). Negative outcomes may comprise biased learning, opportunity traps, amplification of emergent actions, over-reliance on improvisation, anxiety (Pina e Cunha et al., 1999). Consequently, empirical efforts are required to distinguish between descriptive features (what improvisation is) and prescriptive aspects (how to leverage improvisation to enhance organizational objectives) of improvisational processes (Crossan et al., 2005). Moreover, research should clearly investigate the relationship between improvisational processes and performance (Vera & Crossan, 2004).

Moreover, future research should take into account that the concept of organizational improvisation is tightly interrelated with a variety of theoretical domains. These may include organizational learning (Moorman et al., 1998; Weick, 1991), teamwork dynamics (Moorman et al., 1998), creativity (Moorman et al., 1998), innovation (Kamoche, Pina e Cunha, & Vieira da Cunha, 2003), and organizational change (Orlikowski, 1996). Consequently, a better understanding of improvisational dynamics may contribute to strengthen extant research on management studies.

## References

- Agarwal, R. 2000. Individual Acceptance of Information Technologies. In R. W. Zmud (Ed.), Framing the Domains of IT Management: Projecting the Future from the Past: 85-104. Cincinnati: Pinnaflex Educational Resources.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27-58.
- Amabile, T. M. 1988. A model for creativity and innovation in organizations. *Research in organizational behavior*, 10: 123-167.
- Amabile, T. M. 1997. Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review*, 40: 39.

- Amabile, T. M., Schatzel, E. A., Moneta, G. B., & Kramer, S. J. 2004. Leader behaviors and the work environment for creativity: Perceived leader support. *Leadership Quarterly*, 15(1): 5-32.
- Ancona, D. G., & Caldwell, D. F. 1992. Demography and Design - Predictors of New Product Team Performance. *Organization Science*, 3(3): 321-341.
- Avison, D., & Fitzgerald, G. 1999. Information Systems Development. In W. L. Currie, & B. Galliers (Eds.), *Rethinking Management Information Systems*: 250-278: Oxford University Press.
- Brown, S. L., & Eisenhardt, K. M. 1997. The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1): 1-34.
- Caldwell, D. F., & O'Reilly, C. A. I. 1982. Boundary spanning and individual performance: The impact of selfmonitoring. *Journal of Applied Psychology*, 67: 124-127.
- Campion, M. A., Papper, E. M., & Medsker, G. J. 1996. Relations between work team characteristics and effectiveness: a replication and extension. *Personnel Psychology*, 49: 429-452.
- Ciborra, C. U. 1999. A theory of Information Systems based on improvisation. In W. L. Currie, & B. Galliers (Eds.), *Rethinking management Information Systems*. Oxford: Oxford University Press.
- Cooper, B. L., Watson, H. J., Wixom, B. H., & Goodhue, D. L. 2000. Data warehousing supports corporate strategy at first american corporation. *MIS Quarterly*, 24(4): 547.
- Crossan, M. M. 1998. Improvisation in action. *Organization Science*, 9(5): 593-599.
- Crossan, M. M., Pina e Cunha, M., Vera, D., & Cunha, J. 2005. Time and organizational improvisation. *Academy of Management Review*, 30: 129-145.
- Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. 1990. Perceived organizational support and employee diligence, commitment, and innovation. 75: 51-59.
- Faraj, S., & Sproull, L. 2000. Coordinating expertise in software development teams. *Management Science*, 46(12): 1554,1515.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley Publishing Company.
- George, J. M., & Brief, A. P. 1992. Feeling good-doing good: A conceptual analysis of the mood at work-organizational spontaneity relationship. *Psychological Bulletin*, 112: 310-329.
- Hoegl, M., & Gemuenden, H. G. 2001. Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. *Organization Science*, 12(4): 435-449.
- Igbaria, M., Guimaraes, T., & Davis, G. B. 1995. Testing the determinants of microcomputer usage via a structural equation model. *Journal of Management Information Systems*, 11(4): 87.
- Jesitus, J. 1997. Broken Promises? FoxMeyer 's Project was a Disaster. Was the Company Too Aggressive or was it Misled? *Industry Week*: 31-37. "", November 3, 31-37.
- Kamoche, K., Cunha, M. P., & Cunha, R. C. 2003. improvisation in organization. *International Studies of Management and Organization*, 33(1).
- Kamoche, K., Pina e Cunha, M., & Vieira da Cunha, J. 2003. Toward a theory of organizational improvisation: looking beyond the jazz metaphor. *Journal of Management Studies*, 40: 2023-2051.
- Karahanna, E., Evaristo, J. R., & Srite, M. 2005. Levels of culture and individual behavior: An integrative perspective. *Journal of Global Information Management*, 13(2): 1-20.
- Kirsch, L. J. 1996. The management of complex tasks in organizations: Controlling the systems development process. *Organization Science*, 7(1): 1.
- Levitt, B., & March, J. G. 1988. Organizational Learning. *Annual Review of Sociology*, 14: 319-338.
- Lewin, A. Y. 1998. Jazz improvisation as a metaphor for organization theory. *Organization Science*, 9(5): 539-539.

- Lewis, W., Agarwal, R., & Sambamurthy, V. 2003. Sources of Influence On Beliefs About Information Technology Use: An Empirical Study of Knowledge Workers. *MIS Quarterly*, 27(4): 657.
- Liang, D. W., Moreland, R., & Argote, L. 1995. Group vs. individual training and group performance: The mediating role of transactive
- Liao, H., & Chuang, A. (2004). A multilevel investigation of factors influencing employee service performance and customer outcomes. *Academy of Management Journal*, 47(1), 41-58.
- Lovell, J., & Kluger, J. 1995. *Apollo XIII*. New York: Simon & Schuster.
- Marakas, G. M., Yi, M. Y., & Johnson, R. D. 1998. The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward Clarification of the Construct and an Integrative Framework for Research. *Information Systems Research*, 9(2): 126.
- McAllister, D. J. 1995. Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations. *Academy of Management Journal*, 38(1): 24-59.
- memory. *Personality and Social Psychology Bulletin*, 2: 384-393.
- Miner, A. S., Bassoff, P., & Moorman, C. 2001. Organizational improvisation and learning. *Administrative Science Quarterly*, 46: 304-337.
- Mintzberg, H. 1994. *The rise and fall of strategic planning*. New York: Free Press.
- Moorman, C., & Miner, A. S. 1998. Organizational improvisation and organizational memory. *Academy of Management Review*, 23: 698-723.
- Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. 2002. Leading creative people: Orchestrating expertise and relationships. *Leadership Quarterly*, 13: 705.
- Nemeth, C. J., & Staw, B. M. 1989. The tradeoffs of social control and innovation in groups and organizations. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, Vol. 22: 75-210. New York: Academic Press.
- Orlikowski, W. J. 1996. Improvising Organizational Transformation Over Time: A Situated Change Perspective. *Information Systems Research*, 7(1): 63.
- Orlikowski, W. J., & Hofman, J. D. 1997. An Improvisational Model for Change Management: The Case of Groupware Technologies. *Sloan Management Review*, 38(2): 11.
- Pelled, L. H. 1996. Demographic diversity, conflict, and work group outcomes: An intervening process theory. *Organization Science*, 7(6): 615-631.
- Pina e Cunha, M., Vieira da Cunha, J., & Kamoche, K. 1999. Organizational improvisation: what, when, how and why. *International Journal of Management Reviews*, 1: 299-341.
- Schmidt, R., & Lyytinen, K., Keil, M., and Cule, P. 2001. Identifying Software Project Risks: An International Delphi Study. *Journal of Management Information Systems*, 17(4): 5,32.
- Shalley, C. E., & Gilson, L. L. 2004. What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *Leadership Quarterly*, 15: 33.
- Snyder, M. 1974. Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, 30: 526-537.
- Tjosvold, D. 1984. Cooperation theory and organizations. *Human Relations*, 37(9): 743-767.
- Truex, D., Baskerville, R., & Travis, J. 2000. Amethodical systems development: the deferred meaning of systems development methods. *Accounting, Management & Information Technologies*, 10: 53-79.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model for longitudinal field studies. *Management Science*, 46(2), 186-204.
- Vera, D., & Crossan, M. M. 2004. Theatrical improvisation: lessons for organization. *Organization Studies*, 25: 727-749.
- Vera, D., & Crossan, M. M. 2005. Improvisation and innovative performance in teams. *Organization Science*, 2: 203-224.
- Weick, K. E. 1991. The non-traditional quality of organizational learning. *Organization Science*, 2(116-124).
- Weick, K. E. 1998. Improvisation as a mindset for organizational analysis. *Organization Science*, 9(5): 543-555.

- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. 1993. Toward a theory of organizational creativity. *Academy of Management Review*, 18: 293-321.
- Xia, W., & Lee, G. 2005. Complexity of Information Systems Development Projects: Conceptualization and Measurement Development. *Journal of Management Information Systems*, 22(1): 45-83.