

# Chapter VII

## Individual Improvisation in Information Systems Development

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### 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 chapter is the development of theoretical propositions which could be empirically tested in future research.*

### 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 & Pina e Cunha, 2001). Indeed, improvisation may enable managers to continuously adjust to change through a creative process that allows for the development of 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 & Pina e Cunha, 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 & Pina e Cunha, 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 & Pina e Cunha, 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 theoretically analyze the antecedents of individual attitude toward improvisation in the information system development (ISD) domain. In particular, following the suggestions put forward by Orlikowski (1996), we focus on open-ended, customizable technologies which are related to complex organizational changes. In our opinion,

knowing what factors influence the intention to engage in improvisational behaviour is a necessary condition to support improvisation and, thus, to “(...) make sense of complex situations and put us in closer touch with human experience” (Ciborra, 1999b).

By relying on the organizational theory of improvisation, the aim of this chapter 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 chapter is the development of theoretical propositions which could be empirically tested in future researches.

The remainder of this chapter 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.

## **BACKGROUND**

### **The Concept of Improvisation**

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 & Pina e Cunha, 2001), 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” (1998).

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 (Ciborra, 1996; 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).

### **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 (Ciborra, 1999b; 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 (Mintzberg, 1994; Weick, 1998; Kamoche & Pina e Cunha, 2001). 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 leads 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 & Eisenhardt, 1997). Therefore, improvisation is a creative process that aims at developing novel and useful solutions to a particular situation (Crossan et al., 2005).

### **Improvisation and ISD**

In the XXI century, organizations are making significant investments in highly-complex 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., datawarehousing). Given the complexity of these projects, returns on IT investment are often constrained by poor development and implementation processes in the organizational environment (Bwusi-Mensab, 1997).

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 Ciborra (1991) and Avison and Fitzgerald (1999), the dominant approaches to the ISD have focused on the identification of pre-defined phases, allowing for better 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 information systems has often brought to the failure of ISD projects (Jesitus, 1997), as well as to a negative impact on user acceptance (Agarwal, 2000) and productivity (Lewis, Agarwal, & Sambamurthy, 2003). Today’s rapidly changing environment leads developers to cope

with both technological issues and organizational factors which are outside the project team's realm of control (Kirsch, 1996; Schmidt & Lyytinen, 2001). Therefore, because of the complexity of designing and introducing an IS in organizations, the a priori establishment of all encompassing requirements is unfeasible (Orlikowski & Hofman., 1997). Indeed, the development of a new information system through functional decomposition methods, which implies system requirements to be 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, 1999a). 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 fulfill the emergent requests for customization, also by capturing and integrating extemporaneous ideas emerging from "below," from the end user level (Ciborra & Lanzara, 1990). Indeed, 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.

### **The Concept of Individual Attitude**

The proliferation of articles, chapters, and books about attitudes underscores the importance growth of such concept (Ajzen, 2001 for a literature review). According to Fishbein and Ajzen (1975), individual 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 significant attention within the information system domain, with particular focus on individual use of IT (i.e., Venkatesh & Davis, 2000).

Since attitude has demonstrated its robustness for representing individual predisposition to perform a behavior, it could also be adopted to understand individual's tendency to improvise. According to the definition of attitude, and reframing it into the improvisation domain, we define 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). Indeed, 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. Besides beliefs, other studies have pointed out that attitudes may be shaped by individual traits (Rogers, 1995).

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

Extant theoretical literature points out that organizational improvisation relies on factors related to the individual, group and organizational level

## Individual Improvisation in Information Systems Development

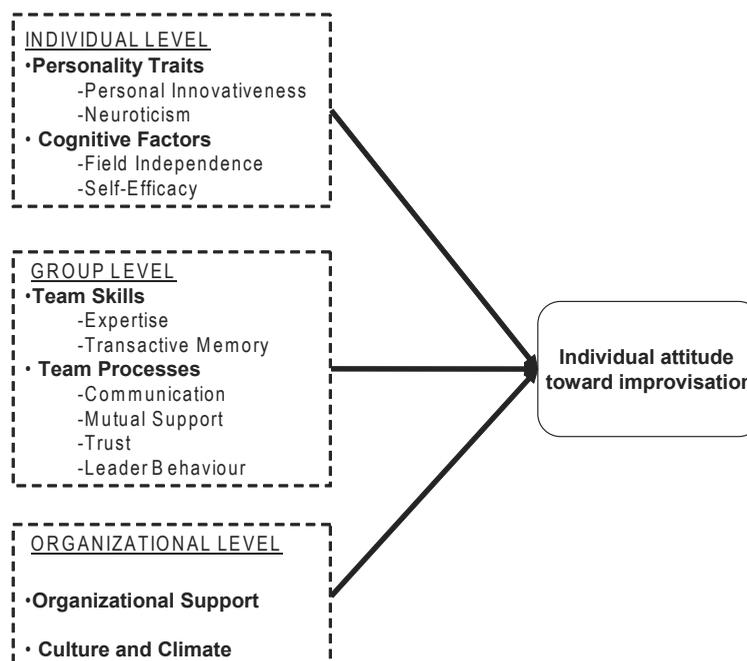
(Crossan et al., 2005; Moorman & Miner, 1998; Vera & Crossan, 2005).

The focus of this research is solely on the relationship between beliefs and individual attitude toward improvisation. Starting from the widely acknowledged proposition that individual attitudes formation depends on individual beliefs and traits, we propose a model which considers how individual beliefs may affect the individual attitude to take improvised actions. To capture the formation of individual attitude toward improvisation, we specify traits and beliefs referred to individual, group, and organizational levels, proposing the following research framework of individual attitude toward improvisation in the IS development domain (Figure 1).

These facets capture individual psychological processes of individuals relative to themselves, to the team in which they are involved, and to the organization they belong to. Therefore, we are focused on those beliefs and traits which are involved in individual psychological processes of

attitude formation, rather than on other individual, group, and organizational characteristics which do not belong to traits or beliefs. Therefore, concepts that can be traced back to individual background such as, for instance, tenure and organizational position, are not comprised in this study. Moreover, characteristics are related to the nature of the task are not included in the study because they are not consistent with the multi-level model adopted in our research, since they do not insist on any of the three levels we consider. Consequently, the level of task complexity or the degree of task routinization are not included in the model. Furthermore, we do not consider the structural characteristics at the group or organization level. Indeed, constructs such as team composition (Pelled, 1996), group size (Campion, Papper, & Medsker, 1996), or evaluation criteria and reward systems (Orlikowski, 1996) cannot be considered as individual beliefs or personal traits. Although we do not consider such elements in our model, we recognize that they may have an influence on organizational improvisation through different

Figure 1. A multilevel perspective of individual improvisation



theoretical pathways than those related with individual psychological processes (i.e., Orlikowski & Hofman, 1997; Vera and Crossan, 2004).

## **Individual Level**

Individual traits and beliefs related to the individual level of analysis may have a significant influence on improvisational behaviours (Crossan, 1998). This issue has been pointed out in different domains, ranging from theatre and jazz (Kamoche & Pina e Cunha, 2001) to management (Vera & Crossan, 2004) and surgery (King & Ranft, 2001). Literature on attitude formation points out that factors belonging to personality traits and cognitive factors have received consistent support as important predictors of individual attitude (e.g., Barrick & Mount, 1991; Judge & Bono, 2001). Together, these two categories refer to the degree to which an individual is comfortable in situations in which improvisation may occur, ultimately influencing attitude toward improvisation.

*Personality traits.* Personality traits refer to individual characteristics which are relatively stable overtime (Woodman, Sawyer, & Griffin, 1993). In the IS domain, it is possible to identify two different kinds of individual traits: broad traits and situation-specific traits. Broad traits are enduring and predispose individuals to respond consistently to stimuli across situations (Thatcher & Perrewe, 2002). On the contrary, situation-specific traits refer to enduring individual predisposition to respond to stimuli in a consistent manner within a narrowly defined context. Since our research is framed within the broad situation of ISD, we argue that broad traits may exert a more pervasive influence on individual attitudes. In particular, referring to the broad traits in the IS and improvisation domain, it is possible to underscore two concepts which may enhance or constrain attitude toward improvisation: personal innovativeness and neuroticism. Personal innovativeness refers to individual predisposition toward change and risk-taking (Hurt et al., 1977; Bommer & Jalajas, 1999). Moreover, individuals who present

a high level of personal innovativeness are more likely to tolerate ambiguity, and to act independently from social influence. Therefore, we argue that innovative individuals are also more likely to improvise, departing from standard procedures for IS development. On the other side, we argue that neuroticism may constrain individual attitude toward improvisation. The fundamental role of neuroticism in shaping attitudes and behaviours can be traced back to the literature on individual stress, which posits its critical role in stressful contexts (Watson & Clark, 1984). Individuals with high neuroticism are more likely to experience anxiety when faced with problems or challenges, as well as in the absence of an objective source of stress (Watson & Clark, 1984). Moreover, other studies have pointed out that individuals with high levels of neuroticism have a higher propensity to dwell on mistakes or inadequacies (Thatcher & Perrewe, 2002). Given the complexity and uncertainty associated with the ISD process, we argue that individuals with a high level of neuroticism present a lower attitude toward improvisation. Thus,

*PROPOSITION 1: Personality factors are antecedents of individual's attitude toward improvisation in 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. Despite that extant literature pointed out many cognitive factors that influence individual attitudes and behavior, we argue that, in the improvisation domain, the most critical factors are those which allow individual to cope with lack of time and to face an emergent and new situation. These two aspects can be captured by looking at two main cognitive factors: field independence and self-efficacy. 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, in a situation characterized by lack of time, an individual with high field independence is more likely to take spontaneous action because he

or she possesses the ability to distinguish important from less important aspects. The other central cognitive aspect which may influence individual attitude toward improvisation is 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, thereby experimenting with new pathways and behaving in a spontaneous fashion. Thus,

*PROPOSITION 2: Cognitive factors are antecedents of individual's attitude toward improvisation in ISD projects.*

### **Group Level**

Improvisation usually occurs through the social interaction among individuals and group members (Vera & Crossan, 2004). This issue is consistent with the proposition of Nemeth and Staw (1989), who state that several attitudes are socially constructed because individuals are immersed in an organizational environment which may facilitate or constrain the improvisational process (see also Vera & Crossan, 2004). In particular, according to Tannenbaum, Beard, and Salas (1992), it is possible to identify two group-level dimensions which may affect individual attitudes. The first one refers to the initial capabilities of of group members in order to reach a certain goal (the input phase in the Tannenbaum model), while the second refers to the process through which these resources are exploited (the throughput phase in the same model). Therefore, in our conceptualization we focus on individual beliefs referred to team skills, and to team processes.

*Team skills.* According to Vera and Crossan (2004), it is necessary for the team to possess a broad set of skills and expertise to allow individuals to feel

confident enough to improvise. In the ISD, expertise represents one of the most critical resources for project effectiveness (Faraj & Sproull, 2000). Moreover, expertise has a positive impact on individual improvisational processes 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 team-level knowledge refers to the notion of transactive memory, which allows team members to encode, store, and retrieve relevant information related to previous experience (Liang, Moreland, & Argote, 1995). During the development of a complex information system, access to diverse memory resources helps individuals improvise, as they can leverage 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 3: Team skills are antecedents of individual's attitude toward improvisation in ISD projects.*

*Team processes.* Team processes refer to the way individuals within the group cooperate to more effectively manage their interdependences. In particular, it is possible to look at the team processes from two different perspectives: the relationship between the individual and his/her peers, and the relationship between the individual and his/her team leader. The degree of collaboration among team members can be analysed through the multifaceted concept of teamwork quality developed by Hoegl and Gemuenden (2001). Considering the six concepts which constitute the concept of teamwork quality, we argue that two of them are more likely to foster the process of resource exchanges among individuals, functioning as a facilitating condition to the improvisational process. Good quality in the communication process allows exchanging information more effectively, helping individuals obtain relevant information in a short time frame. The effect of a good information flow on ISD projects

outcomes has also been empirically demonstrated (i.e., Faraj & Sproull, 2000). The second important issue concerning the cooperation among team members refers to the presence of mutual support. Indeed, mutual support is an important issue to avoid interpersonal conflict among members (Hoegl & Gemuenden, 2001). Moreover, the lack of conflict allows individuals to cooperate to achieve common goals (Tjosvold, 1984). When individuals believe that there is mutual support within the team, they are more likely to rely on one another when they are facing with an unexpected situation. Besides the aspects comprised in the teamwork quality construct, we argue, consistently with Vera and Crossan (2004), that trust among team members represents a fundamental issue in shaping individual attitude toward improvisation. 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 efforts to verify 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, a lack of trust and dysfunctional interaction among members leads individual not to have access to the material needed for improvise (Vera & Crossan, 2004), thereby decreasing their attitude to perform spontaneous actions.

Although team members represent the main factor influencing individuals behavior, it is widely acknowledged that the leader’s behaviour may affect the attitudes and behaviours of employees. We consider 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, thereby 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, although they 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 (see Amabile, Schatzel, Moneta, & Kramer, 2004). Since the improvisation process involves trial and error and discovery, the leader’s behaviour should be consistent with this approach. Accordingly, leaders should provide the necessary resources to help individuals 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, we hold that individuals who perceive support from their leader present a higher attitude toward improvisation in the context of complex ISD projects. Thus,

*PROPOSITION 4: Team processes are antecedents of individual’s attitude toward improvisation in ISD projects.*

## **Organizational Level**

Individual beliefs referred to the organizational level represent a facilitating condition for improvisational process (Vera & Crossan, 2004), thereby enhancing individual attitude toward improvisation. Recalling the theories of improvisation, many authors underscore the influence of the organizational environment on the improvisational process and outcome (Kamoche & Pina e Cunha, 2001; Vera & Crossan, 2004). Following such insights, we point out that those individual beliefs concerning the organizational context which may affect individual attitude to improvise. These factors include organizational support and organizational culture and climate.

*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, and Davis (1995) underscore the importance of top management support, which refers to the allocation of sufficient

resources and to the encouragement of employees. George and Brief (1992) suggest that organizational support is positively related to employees' efforts. In particular, employees who perceive that the organization recognizes and rewards their efforts to carry out their job effectively are more likely to engage in behaviours that go beyond their formal duties. Therefore, if individuals in ISD projects perceive that they are supported by the organization through sufficient resources, they may be more likely to break routines and to engage in improvisational behaviours. Thus,

*PROPOSITION 5: Organizational support is an antecedent of individual's attitude toward improvisation in ISD projects.*

*Organizational culture.* 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 are encouraged and freely discussed, improvisational activities within individuals and groups are free to emerge and be evaluated. Therefore, we argue that during the development of an information system, individuals who perceive a positive climate and an experimental culture would be more likely to improvise, thereby departing from established plans. Thus,

*PROPOSITION 6: Organizational culture is an antecedent of individual's attitude toward improvisation in ISD projects.*

### **FUTURE TRENDS**

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, and 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). Therefore, future research should test the validity of the theoretical model presented in the present contribution for a better understanding of descriptive features of improvisational attitude. Furthermore, research should clearly investigate the relationship between improvisational processes and performance (Vera & Crossan, 2004), for understanding the contingencies that allow a positive outcome of improvisational actions.

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.

In our theoretical arguments, we did not consider group-level structural characteristics as team composition (Pelled, 1996) and geographical dispersion (Hoegl & Proserpio, 2004). Although we did not consider such elements in our model, we recognize that they may have an influence on organizational improvisation through different theoretical pathways (i.e., Orlikowski & Hofman, 1997; Vera & Crossan, 2005) and encourage further inquiry exploring such possible relationships.

## **CONCLUSION**

### **Theoretical and Managerial Implications**

The present study has provided a theoretical framework to be validated and tested in subsequent empirical research. By doing so, we have moved an initial step towards answering Ciborra's call to design activities, settings, and systems in a way that captures open experimentation, deviations, incongruencies, and mismatches that "(...) populate the design and implementation agenda" (Ciborra, 1991). 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).

Recognizing and capturing the instances and outputs of improvisation, bricolage, serendipity, and tinkering can allow organizations to keep the development of IS "(...) close to the competencies of the organization and to on-going fluctuations in local practices" (Ciborra, 1991).

Moreover, if the model offered here is supported empirically, some important practical implication may rise for the ISD domain. First of all, this chapter offers a more structured perspective to guide organizations in looking at ISD through a new perspective. This aspect is consistent with the assumption made by Ciborra (1999a) when he 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 to re-focus the alignment between the requirements of an ISD project and the capabilities of individuals involved in the project team. Indeed, 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 of the firm to facilitate the emergence of improvising behaviour could also represent a critical aspect in the relationship between team members and end users. Developers who have an attitude toward improvisation may be better able to understand and grasp the emergent signals and requests from users. The ability to fulfill users' emergent requests may allow for a deeper involvement of end users, with a

consequent enhancement of their satisfaction using the system (Agarwal, 2000).

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## **KEY TERMS:**

**Individual Improvisation:** Creative and spontaneous process of managing an unexpected event.

**Information Systems Development:** Analysis, design, and implementation of IS applications/systems to support business activities in an organizational context.

**Individual Attitude:** Predisposition to respond in a consistently favourable or unfavourable manner with respect to a given psychological object.

**Personality Trait:** Individual characteristic which is relatively stable overtime.

**Team Processes:** The way individuals within the group cooperate to manage their interdependencies.

**Organizational Support:** Employees' perception about the extent to which the organization cares about their well being.