



Università Ca' Foscari – Venezia

L'ORGANIZZAZIONE FA LA DIFFERENZA?

IX Workshop dei Docenti e dei Ricercatori di Organizzazione Aziendale

7 – 8 Febbraio 2008

Track: Modelli organizzativi per l'innovazione e per il trasferimento tecnologico

**IMPROVISATION IN GEOGRAPHICALLY-
DISPERSED TEAMS: DOES DISTANCE MATTER?**

MASSIMO MAGNI

Bocconi University, Institute of Organization and Information Systems
and SDA Bocconi School of Management
emme.magni@unibocconi.it

BERNARDINO PROVERA

Bocconi University, Institute of Organization and Information Systems
and SDA Bocconi School of Management
bernardino.provera@unibocconi.it

LUIGI PROSERPIO

Bocconi University, Institute of Organization and Information Systems
and SDA Bocconi School of Management
luigi.proserpio@unibocconi.it

Introduction

Since organizations operating in turbulent environments must learn to swiftly adapt and react, improvisation has become an important issue for both scholars and practitioners (Kamoche & Pina e Cunha, 2001; King & Ranft, 2001). Improvisation is particularly relevant in complex and dynamic tasks, as these cannot be entirely understood a priori, do not rely on the application of routines, require low degrees of structuration, and require flexibility and fast, extemporaneous reactions (Flamholtz, Das, & Tsui, 1985; Kirsch, 1996; Kamoche & Pina e Cunha, 2001).

However, research on improvisation is still at an immature stage (Kamoche & Pina e Cunha, 2001; Vera & Crossan, 2005). Even though a number of works in different research domains such as organizational learning (Miner, Bassoff, & Moorman, 2001), technology implementation (Orlikowski & Hofman, 1997), and new product development (Kamoche & Pina e Cunha, 2001) have developed theoretical frameworks based on improvisation, important gaps in this literature are still evident.

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; Cornelissen, 2006). This view tends to obscure the notion that “improvisation is more than a metaphor” (Crossan, 1998: 593). Second, prior research considered organizational improvisation as a positive outcome, while less emphasis has been placed on the contingencies related to effective improvisation (Vera & Crossan, 2005).

The present article tries to fill the above mentioned gaps showing team members dispersion as a moderator of improvisation-innovation relationship. As such, the article proposes that improvisation affects team innovation more strongly in co-located teams.

Investigating the role of proximity on the relationship between improvisation and performance offers significant contributions to extant literature on improvisation in organizations leveraging on the fact that individual improvisation is more likely to occur within the framework of social interaction with other individuals (Crossan & Sorrenti, 1997) and high-speed decision making is influenced by how team members interact (Smith et al., 1994). In particular, complex and dynamic tasks are regularly conducted through team projects, as teams represent the most immediate social entities through which individuals obtain resources (Faraj and Xiao, 2006) for both planned actions and for facing unexpected scenarios (Vera & Crossan, 2005).

We test our cross-level hypotheses using data from 138 team leaders and members of 38 Information Systems Development (ISD) projects which fit with our research framework because are characterized by the lack of a-priori identifiable paths to the solution (Lee & Xia, 2005).

Theoretical Framework

Improvisation

Improvisation has been defined as a form of intuition guiding 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: 735), and “drawing on available cognitive, affective, social and material resources” (Kamoche et al., 2003: 2025). Improvisation can be regarded as “the deliberate and substantive fusion of the design and execution of a novel production” (Miner et al., 2001: 314). Furthermore, Moorman and Miner define it as “the degree to which composition and execution converge in time” (1998a: 699). Improvisation

comprises the spontaneity and real-time nature of an action: individuals respond to situations on the spur of the moment rather than anticipating the move, or composing while executing (Moorman and Miner 1998b). The creative dimension of improvisation refers to the attempt to take creative action in situations that are complex and ambiguous (Drazin et al. 1999). Thus, the creative aspect of improvisation refers to the search for novelty and useful ideas in performing spontaneous behaviors (Shalley & Gilson, 2004). Drawing on the theoretical frameworks of creativity and spontaneity, and following Vera and Crossan (2005), we define individual improvisation as the creative and spontaneous process of managing an unexpected event.

However, improvisation should not necessarily be regarded as the result of stand-alone events, such as organizational crises (Ciborra, 1999b; Vera & Crossan, 2004). On the contrary, improvisation is thought to occur along a continuum in which 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). Following Vera and Crossan (2005), we examine improvisation as it occurs across the full spectrum of the continuum and do not differentiate between incremental and radical improvisation.

Team member proximity and effective innovation

In recent years, most organizational issues are tackled via teamwork, rather than through the aggregation of independent individual efforts. Complex and dynamic tasks are regularly conducted through team projects, as teams represent the most immediate social entities through which individuals obtain resources (Faraj and Xiao, 2006; Hoegl, Parboteeah, & Munson, 2003) for both planned actions and for facing unexpected scenarios (Vera & Crossan, 2005). Previous studies have pointed out that high-speed

decision making is influenced by their structural characteristics (Smith et al., 1994). Following a global trend toward internationalizing both production and marketing activities, organizations are increasingly relying on geographically-dispersed teams to accomplish projects (Kirkman et al., 2004). In particular recent research has argued that the distinction between totally face-to-face and totally virtual teams is unrealistic and artificial, whereas virtuality lies on a continuum ranging from highly to minimally co-located. Nonetheless, distance in the location of team members have been show to have a significant impact on team performance (Hoegl & Proserpio, 2004; Hoegl, Ernst & Proserpio, 2007). Consequently, we specifically focus on a contextual factor which may inhibit (or enhance) improvisational behavior: team member proximity. In our study, we chose to focus on degree of proximity as a key moderator, because we believe that proximity is one of the most important structural characteristics which affect the team likelihood to exchange information in a timely manner (Hoegl and Proserpio, 2004). As such, the study postulates that as team member proximity increases (i.e., team members are increasingly closed one another), the influence of improvisation on team innovation increases (Figure 1).

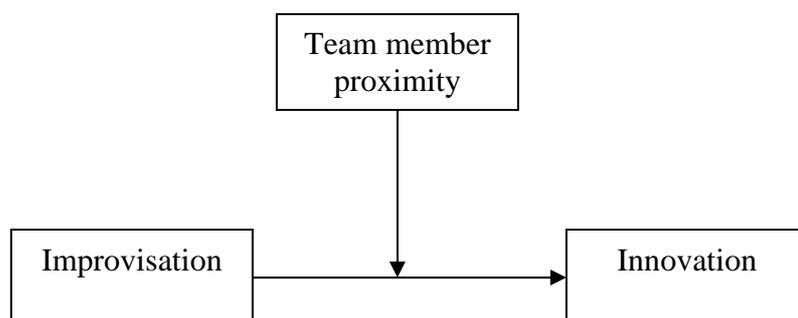


Figure 1. Theoretical model

This hypothesis is postulated for the following main reasons. The collaborative team processes that allow individuals to have timely access to important knowledge can

be hindered by the physical distance among team members, limiting the team's ability to maximize the outcome of an improvised action. Indeed, according with previous research (Hoegl et al. 2007) team collaborative processes are more difficult to achieve with an increasing distance between team members. Dispersion creates an environment which hinders team members to coordinate activities and to exchange relevant information which could be useful in facing an unexpected event. Thus, dispersed teams are less likely to rely on those mechanism which support individuals in performing improvisational behaviors.

Hypothesis 1: The greater the team member proximity, the more positive the relationship between improvisation and innovation.

Methodology and results

Study context

The data to test our hypotheses comes from information systems development (ISD) projects in one large Italian consulting company. ISD projects represent an ideal setting to investigate the role of proximity on improvisation in the domain of complex and ambiguous tasks (Kirsch, 1996; Lee & Xia, 2005). Since ISD projects rely on heuristic processes and do not have clear and readily-identifiable paths to the solution (Lee & Xia, 2005), they require a high degree of unplanned action by organizational actors (Gerwin & Moffat, 1997; Ciborra, 1991; Ciborra, 1999a; Truex, Baskerville & Travis, 2000). As basic requirements for complex tasks are established a priori, however, project success derives from the team members' ability to fulfill the emergent requests for customization, capturing and integrating extemporaneous ideas emerging from implementers and end users (Ciborra & Lanzara, 1990; Elbanna, 2006). Moreover, ISD projects are considered inherently creative because they involve the generation and

evaluation of new ideas and solutions (Tiwana & McLean, 2005). Thus, improvisation may enable individuals to continuously adjust through a creative process that allows for the development of novel and useful solutions (Crossan, Pina e Cunha, Vera, & Cunha, 2005), facing the environmental need for flexibility and rapid responses to emergent situations (Smith, Smith, Olian, Sims, O'Bannon, & Scully, 1994).

Participants were selected among teams developing application software. We selected only those teams that were developing business application software, in order to eliminate teams working on significantly different tasks (e.g., system software) (Faraj and Xiao, 2006). Moreover, in order to avoid retrospection bias, we excluded from our sample those teams that had already completed their project. Respondents' participation in this study was strictly voluntary. Data were gathered through a fully standardized questionnaire containing seven-point Likert-type scales. To obtain more reliable ratings of the team-level constructs under consideration, multiple respondents from each team participated, one of whom was the team leader. For considering the surveys usable we required that at least two questionnaires be completed for each team.

Our study involves more than 280 individuals belonging to 53 ISD teams and we tested our hypothesis using multiple regression models.

Measures

Team innovation. Four items has been developed in order to assess team innovation (Cronbach's alpha .82). To avoid single source data, innovation has been assessed through team-leader responses.

Team member dispersion: the dispersion of team members was measured by using four items from Hoegl and Proserpio (2004) pertaining to the share of team members working in the direct vicinity of one another, whether team members were

easily reachable on foot, and whether it was problematic to arrange spontaneous face-to-face meetings (Cronbach's alpha .90).

Improvisation. Improvisation was measured through a six-item scale adapted from Vera and Crossan (2005) for assessing both its creative and spontaneous facets. The coefficient alpha was .75 for this scale.

Table 1 provides descriptive statistics and correlations for all variables.

	Mean	SD	Alpha	Improvisation	Proximity	Innovation
Improvisation	3.43	0.50	.75	1		
Proximity	3.84	1.03	.90	.09	1	
Innovation	3.82	0.75	.82	.30*	.05	1

Table 1. Descriptives and correlations. * $p < .05$; ** $p < .01$; *** $p < .001$

Multiple regression analysis was used to test the hypothesis (Aiken and West, 1991). The significance of the proposed interaction effect was assessed after the main effects had been entered. According to Aiken and West (1991), variables has been centered around the grand-mean before the interaction in order to avoid multicollinearity problems (Table 2). The results of the regression models provide support for our hypothesis: The positive impact of improvisation on team innovation increases with team members' increasing proximity (beta= .34; $p < .01$). Figures 2 depicts the moderation effect found.

	Dependent variable	
	Innovation	
	Model 1	Model 2
Improvisation	.30**	.39**
Team Member Proximity	.02	.02
Improvisation X Team Member Proximity		.34**
R sq.	.09	.20
R sq. change		.11**
F	2.55	4.17**

Table 2. Regression results. * $p < .05$; ** $p < .01$; *** $p < .001$

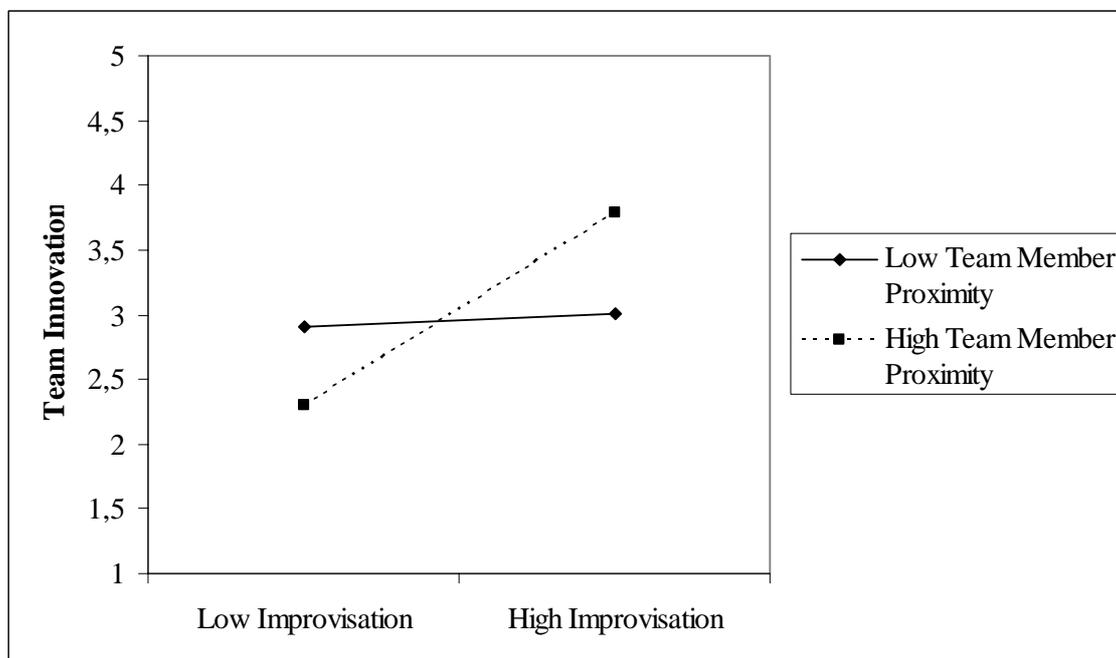


Figure 2. Interaction effect

Conclusion

Our results contribute to the literature on teamwork by highlighting the role of dispersion, answering a call to focus on a research area that has remained relatively unexplored (Kirkman et al. 2005). In particular we frame the team dispersion in the context of complex task which require improvisational behaviors to deal with unexpected events. From this perspective we answer a call by Vera and Crossan (2005) in the attempt of clarifying the value of improvisation. Thus, we shift from an idealized concept, moving toward an understanding of environmental conditions which may foster or hinder the effects of improvisation.

Our results may help managers to be aware of the dangers that virtuality may foster in the accomplishment of those tasks which require a high degree of unplanned action. Therefore, managers in designing a new project team should balance the degree of virtualità and the degree of unplanned actions that should be taken by the team members. In conclusion, organizations should consider improvisation as a potentially effective skill and tool “(...) that complements planning efforts, but that, because of its creative and spontaneous nature, is not necessarily tied to success, the same way planning is not necessarily associated with success” (Vera and Crossan, 2004: 748). Therefore, 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).

Future research should also take into account that improvisation is not an inherently positive or negative phenomenon (Crossan et al., 2005; Miner et al., 2001). 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, some important practical implication may rise for the ISD domain. First, we have taken 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: 288).

Second, this paper 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: 152) 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".

REFERENCES

- Aiken, L. S., & West, S. G. 1991. *Multiple Regression: Testing and interpreting interactions*. Thousand Oaks: Sage.
- Ciborra, C. U. 1999a. A theory of Information Systems based on improvisation. In W. L. Currie, and B. Galliers (Eds.), *Rethinking management Information Systems*, 136-155. Oxford: Oxford University Press.
- Ciborra, C.U. 1999b. Notes on improvisation and time in organizations. *Accounting, Management and Information Technologies*: 9, 77-94.
- Ciborra, C.U. 1991. From thinking to tinkering: the grass roots of strategic information systems. *Proceedings of the International Conference on Information Systems (ICIS)*, 283-291.
- Ciborra, C.U. 1996. The Platform Organization: recombining strategies, structures, and surprises. *Organization Science*, 7 (2): 103-118.
- Ciborra, C.U., & Lanzara, G.F. 1990. Designing dynamic artifacts: computer systems as formative contexts. In Gagliardi, P. (Ed.), *Symbols and artefacts: views of the corporate landscape*. Berlin: De Gruyter.
- Cornelissen, J.P. 2006. Making sense of theory construction: Metaphor and disciplined imagination. *Organization Studies*, 27: 1579-1597.
- Crossan, M., & Sorrenti, M. 1997. Making sense of improvisation. *Advances in Strategic Management*, 14: 155-180.
- Crossan, M. M. 1998. Improvisation in action. *Organization Science*, 9(5): 593-599.
- Drazin, R., Glynn, M. A., & Kazanjian, R. K. 1999. Multilevel theorizing about creativity in organizations: A sensemaking perspective. *Academy of Management Review* 24(2): 286-307.
- Elbanna, A.R. 2006. The validity of the improvisation argument in the implementation of rigid technology: The case of ERP systems. *Journal of Information Technology*, 21: 165-176.
- Faraj, S. & Xiao, Y. 2006. Coordination in Fast-Response Organizations. *Management Science*. 52 (8): 1155-1169.
- Flamholtz, E.G., Das, T.K., & Tsui, A.S. 1985. Toward an integrative framework of organizational control. *Accounting, Organizations and Society*, 10 (1): 35-50.
- Hoegl, M. Ernst, H & Proserpio, L. 2007. How Teamwork Matters More as Team Member Dispersion Increases. *Journal of Product Innovation Management*, 24, 156-165.

Hoegl, M., Parboteeah, K.P., & Munson, C.L. 2003. Team-level antecedents of individuals' knowledge networks. *Decision Sciences*, 34(4): 741-770.

Hoegl, M., & Proserpio, L. 2004. Team member proximity and teamwork in innovative projects. *Research Policy*, 8: 1153-1165.

Kamoche, K., & Pina e Cunha, M. 2001. Minimal structures: from jazz improvisation to product innovation. *Organization Studies*, 22 (5): 733-764.

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.

King, A.W., & Ranft, A.L. 2001. Capturing knowledge and knowing through improvisation: what managers can learn from the thoracic surgery board certification process. *Journal of Management*, 27: 255-277.

Kirkman, B.L., Rosen, B., Tesluk, P.E. & Gibson, C.B. 2004. The impact of team empowerment on virtual team performance: The moderating role of face-to-face interaction. *Academy of Management Journal*, 47, 175-192.

Kirsch, L. J. 1996. The management of complex tasks in organizations: Controlling the systems development process. *Organization Science*, 7(1): 1-21.

Lee, G. & Xia, W. 2005. The ability of information systems development project teams to respond to business and technology changes: a study of flexibility measures. *European Journal of Information Systems*, 14: 75-92.

Miner, A. S., Bassoff, P., & Moorman, C. 2001. Organizational improvisation and learning. *Administrative Science Quarterly*, 46: 304-337.

Moorman, C., & Miner, A. S. 1998a. Organizational improvisation and organizational memory. *Academy of Management Review*, 23: 698-723.

Moorman, C., & Miner, A. S. 1998b. The convergence of planning and execution: Improvisation in new product development. *Journal of Marketing*, 62: 1-20.

Orlikowski, W. J. & Hofman, J. D. 1997. An Improvisational Model for Change Management: The Case of Groupware Technologies. *Sloan Management Review*, 38 (2):11-21.

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.

Shalley, C., & 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 (1): 33-54.

Smith, K. G., Smith, K. A., Olian, J. D., Sims, H. P., O'Bannon, D. P., & Scully, J. A. 1994. Top management team demography and process: The role of social integration and communication. *Administrative Science Quarterly*, 39: 412–438.

Tiwana, A., & McLean, E. 2005. Expertise Integration and Creativity in Information Systems Development. *Journal of Management Information Systems*, 22 (1): 13-43

Truex, D., Baskerville, R. & Travis, J. 2000. A methodical systems development: the deferred meaning of systems development methods. *Accounting, Management and Information Technologies*, 10: 53-79.

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*, 3: 203-224.