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Abstract

Why do so many IS/IT-related projects fail to deliver the level of tangible and sustainable performance improvements organizations target and expect? Why are the new mindsets and ways of operating enabled by IS/IT innovations so difficult to be integrated and adopted in organizations? Why do factors such as resistance to change, insufficient executive sponsoring, unrealistic expectations, or ineffective leadership still nullify the efforts put into the implementation of conceptually and technically sophisticated information and communication (including enterprise resource planning, supply chain management, collaboration, knowledge management and similar IS/IT-based) systems? These questions, which are relevant to both IS/IT research and practice, are at the core of a simulation-based experience aimed at deepening and extending our understanding of issues related to managing organisational change and transformation in the context of IS/IT implementation projects, providing at the same time a new approach to model, validate and diffuse efficiently (through a game-like experience) knowledge in this relevant domain.

Keywords: *IS/IT implementation, organizational change, simulations and management games.*

1   THE STARTING POINT: A CHALLENGING ELEARNING SCENARIO

Organizational change in the context of IS/IT implementation projects is a subject which has been extensively addressed in the academic literature (see e.g. [1, 2, 3]) as well as in the business press (see e.g. the recent article of a well-known CIO identifying the capability to manage change and to identify and successfully implement increasingly disruptive, or 'game-changing', innovation as two of the key challenges facing organizations in the next decade [4]). In practice, a large number of ambitious IS/IT projects end up not even going much beyond the planning phase, being put relatively early on low priority, or, when initiated, failing to mobilize the energy and resources necessary to 'take off', heading often towards an early crash, or towards becoming seriously re-dimensioned (becoming meaningless in terms of impact), not being able to survive early pilot phases, or reach only 'cosmetic' changes, in which processes and systems are put in place, but not used, leading to situations in which people, individually or collectively, claim publicly to operate differently, but actually don't. Failure (in terms of achieving the expected performance targets in spite of the extensive financial and other resources invested) still appears to be the most frequent outcome of IS/IT projects, reinforcing the need to extend and efficiently diffuse knowledge on the factors determining the success or failure of such organizational innovation and transformation initiatives.

Advanced learning technologies such a social simulation – computer-based role-playing games in which players interact with realistically modelled 'virtual' characters whose attitude and behaviour can change dynamically over time as a function of which initiatives the players undertake to influence them - represent a promising new way of addressing complex areas such as the development of

knowledge and the diffusion of change management competencies relevant to the implementation of IS/IT projects.

According to their underlying experiential learning model, such simulations put players, working in teams to increase knowledge exchange and collaborative learning, in the condition to operate within realistic organizational scenarios such as the one proposed by the EIS Simulation, a management game which has been gradually adopted over the last years to enhance change management courses in universities such as Stanford, Columbia, Northwestern, Carnegie Mellon, Wharton, London Business School or INSEAD [5, 6]:

> "Imagine being asked by the Headquarter of a large multinational corporation called *EuroComm*, to join a team of change agents for a very delicate mission. You'll be sent to *Teleswitches*, a newly acquired company, to convince the members of its very successful but very independent-minded top management team that it's high time to harmonize their information, cost accounting and reporting systems to the ones of the whole group to increase transparency and guarantee consistent procedures corporate-wide. You'll have up to 6 (simulated) months to accomplish your mission and introduce this major innovation at Teleswitches.
>
> It's during this mission that you'll have the opportunity to show your skills as member of an ideally diverse change agent's team. You'll first have to develop a joint strategy, and then put it into practice, gradually coming in touch with, getting to know, interacting, and hopefully successfully changing the attitude of a number of 'virtual change recipients'. These characters represent the actual top management team of the target company. As you are going to realize quickly, their attitude and behavior has been designed to reflect realistically the variety of reactions people display when confronted with significant change (particularly when this change comes from 'outside'). During your mission, you'll have the opportunity of selecting and launching a large number of change management and communication initiatives, realizing that people will react very differently (collaboratively, defensively, apathetically, etc.) depending on when and how you will intervene, on their personal attitude towards the change you aim at introducing, on their role within the company, on their perception of your role, on their risk profile, their sensitivity to distributive and procedural fairness [7], their need for self-determination, their internal relationships and tensions, and many other factors which might change over time as a function of what you will or will not do in order to drive change in 'their' company.
>
> Besides experiencing individual reactions, you'll also be able to realize (and sometimes too late) the power of formal and informal networks, the fact that managers with well-sounding formal titles might end up not being the most influential, that positive as well as negative attitudes towards change follow a number of not always straightforward diffusion patterns, that habits and cultural specificities might play a bigger role than we might expect, and that failing to realize all these factors in time might seriously diminish the effectiveness of your well-thought change initiatives and even threaten the whole project. What might have started with an optimistic strategic planning session with your fellow change agents might even become, during the actual implementation, a stressful and frustrating nightmare." [8]

The realism of social simulations, combined with the possibility of providing IS/IT experts and managers with a risk-free context in which to experience first hand the key organizational factors determining the success or failure of IS/IT projects, has a number of pedagogical advantages. An initial discussion of these advantages is presented in the following section ('Pedagogical Considerations').

Furthermore, the challenge of developing formal models and flexible software aimed at simulating complex dynamic situations such as the one summarized in the above scenario, and the opportunity to use social simulations in a research context to support data gathering and hypothesis validation, raises a set of additional issues addressed in section 3 ('Research Implications').

2   PEDAGOGICAL CONSIDERATIONS

As discussed in [9], the key role of games in triggering learning, knowledge structuring and cognitive change in children has been extensively analysed in the work of Piaget and Vygotsky [10, 11]. In adult education, and particularly management development, computer simulation games have been employed successfully over several decades, and studied extensively in terms of their impact on

variables such as the development of various competencies and skills, motivation, willingness to experiment, development of appropriate mental models, and critical thinking [12, 13, 14].

In terms of immediate impact, observation of players' teams (consisting of general managers operating in the IS/IT industry, consultants and IT managers) combined with focus groups and direct feedback have confirmed that simulations such as the one outlined in the previous section succeed in reflecting real situations and triggering in a playful and memorable way a deep understanding of the different factors involved in introducing major IS/IT innovations in organizations, and in particular:

- the key role of individuals, their natural attitudes towards innovation, the phases necessary to gradually make them confident and motivated to adopt innovations, the different resistance patterns and defensive arguments which are likely to emerge during the process, as well as the underlying reasons, whose understanding is critical in order to be able to diagnose and face them adequately,
- the importance of diagnosing and addressing the impact of formal and informal networks in order to manage efficiently the innovation diffusion process,
- the necessity to understand and include cultural factors rooted in organizational contexts to develop a successful strategy and guide the selection of appropriate tactics when introducing major innovations (such as corporate-wide information, communication or knowledge management initiatives) in such contexts,
- the relevance of taking into consideration the non-linear dynamics of change processes in social contexts, in order to manage expectations more realistically.

Beyond these specific pedagogical objectives, social simulations also enhance the learning process by:

- generating a productive level of dissatisfaction with the status quo [15, 16], which is particularly important to face the natural overconfidence which can be found in IT managers and professionals when it comes to manage change processes,
- making learners aware of the 'Knowing-Doing' gap [17], which can potentially affect IS/IT implementation projects.

3   RESEARCH IMPLICATIONS

From a research perspective, social simulations such as the one illustrated in the first section represent two types of challenges and opportunities we are currently exploring.

The first one consists in the use of such simulations not only as a way of stimulating and enhancing learning processes - as pedagogical tools - but also to support research on the underlying phenomena (in this case: organizational change dynamics related to IS/IT implementation projects). Such simulations are for instance currently used to complement traditional data gathering tools such as questionnaires and interviews in projects aiming at better understanding IS/IT-enabled innovation dynamics in contexts such as family businesses, Chinese companies, or urban communities [9], in which specific factors determine the attitude and resistance patterns of key individuals, the nature and impact of formal and informal influence networks, as well as the importance of cultural dimensions. Current experiences are providing evidence involving domain experts into simulation games prior to addressing the question 'What is different in our contexts?' (e.g. a town, a family business, a Chinese company, etc.) can lead to the emergence of a more extensive and rich set of data and insights, as well as a higher involvement of the subjects into the data gathering process and in the validation of the completeness and realism of the data provided. In future, simulations might definitely play a more important and significant role in research by supporting both data gathering and hypotheses validation.

The second challenge and opportunity is related to the design of advanced eLearning systems, both from a modeling and technological perspective. Developing realistic 'games' enabling managers to experience complex situations involving people and interactions in social contexts is one of the most challenging frontiers of management education [17, 18], as it involves the development and integration of formal models relying on insights gained in disciplines such as personality theory, team and organizational behavior, social psychology, or network analysis. Technologically, it enables active

experimentation with advanced eLearning technologies such as believable intelligent agents technology [19, 20, 21] or distributed real-time 3D spaces in which users can easily navigate, meet, interact and realistically simulate interventions in 'virtual worlds' [22,23] supporting both experiential and collaborative learning.

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