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# Human, Contextual, and Processual Issues Influencing Enterprise System Use

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# HUMAN, CONTEXTUAL, AND PROCESSUAL ISSUES INFLUENCING ENTERPRISE SYSTEM USE

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## Abstract

*Once enterprise systems (ES) are set in place, the question most frequently asked by companies is whether they are realizing the investment value. First, organizations have had innumerable problems in finishing implementations on time and on budget as planned. Now, it seems that there are problems in reaching the planned business results. The ES post-implementation phase is a new concern. This research-in-progress paper shows the preliminary results of the human, contextual, and processual issues influencing the ES-use. The findings from the first site show that ES-use evolves in a virtuous continuous improvement cycle. Human, contextual and processual issues define the way as the use of the system evolves over time. As requirements are satisfied and new opportunities are detected, the system is used more extensively to perform relevant functions: decision support, work integration, and customer service.*

## Introduction

After going live, companies are asking themselves whether they are realizing the value from their enterprise systems (ES) investments (Irving 1999). First, organizations have had innumerable problems in finishing implementations on time and on budget as planned (Buckhout *et al.* 1999). Now, it seems that there are problems in reaching the planned business results too. The ES post-implementation phase, and how to measure its success, is a new concern. This phase has not been extensively and deeply studied yet. The literature has focused on the implementation phase and on its project issues (Hirt and Swanson 1999; Holland and Light 1999).

The pilot case study of this research identified the use of ES as a recurring worry. The pilot study was carried out in "El Metro de Caracas" (City of Caracas Underground Company), which implemented, in the first phase, the functionalities of Finance and Materials Management of SAP/R3. Interviewees argued that ES is being used only as transactional systems. They considered that the informating role (Zuboff 1988) for making decision and the work integration role (Davenport 1998) are not being carried out completely. Hence, ES seems to be being under-utilized. In this sense, ES-use emerges as a critical success measure in the ES post-implementation phase. Here, ES-use measures how extensively an ES is used in an organizational context.

To study how extensively ES is used in an organizational context, this research is going to consider two models: Zuboff's (1988), and Hirschhorn and Farduhar's (1985). Zuboff (1988) defined two roles of IT: automating and informating. Hirschhorn and Farduhar (1985) identified three functions of IT utilizations: decision support, work integration, and customer service. In the ES context, automating can be defined as applying ES to automate business processes so that these processes can be performed with more continuity, uniformity and control. On the other hand, informating means using ES to generate information about the processes through which an organization performs its work. As a consequence of this informating power of ES, these systems can be used for solving problems and justifying decisions (decision support), for coordinating activities among different business areas and among superiors and subordinates (work integration), and for servicing internal and external customer (customer service).

The other important question is which and how human, contextual and processual issues influence ES-use. A Process is defined here as the sequence of events, actions, and activities that define how extensively ES is used in an organizational context. Organizational context refers to the environment in which the flow of events occurs (Pettigrew 1997). As Pettigrew (1997) points out, "processes are embedded in contexts and can only be studied as such" (p.p. 340). Finally, human issues means user perceptions and beliefs that determine intentions and ultimately influence behaviour with respect to an ES (that is, ES-use). With

respect to process, Markus and Tanis (1999) describe the ES experience as a particular process of several phases. For them, the results and actions in one phase are conditions that influence the results in the next phase. From this view, ES-use is influenced by different results and actions from previous phases. Processual issues influencing ES-use have been identified from the pilot study and ES literature. They are as follows: training to users (Markus and Tanis 1999, Wheatley 2000), knowledge transfer from the project team to end-users (Schneider 1999, Soh *et al.* 2000), organizational fit to exploit the system's capabilities (Menezes 1999, Greenbaum 1998), and ES configuration-tailoring (Brehm *et al.* 2000). Contextual issues were also identified from the pilot study and ES literature. They are organizational structure and budget for the ES experience (Markus and Tanis 1999), and power relations and user skills (Schneider 1999). Finally, from the pilot study, user beliefs were identified as influencing intentions and behaviour toward using. For instance, a group of users gave a new meaning to the acronym SAP: "Sí Aprendes Permaneces", which is Spanish for "if you learn it, you do not leave the company". In the light of the above, this investigation aims to develop a novel theory for conceptualising the relationship between the human factors and broader contextual and processual issues associated with ES-use.

## The Research Methodology

The research strategy has been based on case studies for constructing theory using grounded theory from the observed field data (Walsham 1995, Glaser and Strauss 1967). An a priori research framework has been developed to help shape the initial design and measuring constructs more accurately. However, this framework is tentative and no construct is guaranteed a place in the resultant theory. Three sites have been selected in accordance with theoretical sampling (Glaser and Strauss 1967). Since they are in the post-implementation phases, the author can capture the process through a combination of retrospective and real time analysis. The first site is Café Madrid, which is the leading company in manufacturing and distributing coffee in Venezuela. The second site is the Venezuelan subsidiary of a global company dedicated to manufacturing, marketing, and distribution a broad portfolio of chemicals and plastics. The third site is the leading company in engineering projects for the petroleum sector in Venezuela. The first two sites implemented Baan IV. The third site implemented SAP/R3. The methods of data collection have been semi-structured interviews, observation and documentary review. The heart of the case study protocol has been a set of substantive questions that reflect the research inquiries. Forty interviews have been conducted, each lasting an average of one and a half hours. The data analysis has consisted of three iterative activities: data reduction, data display and conclusions drawing/verification (Miles and Huberman 1994). The iteration process will end when the analysis reaches 'theoretical saturation' (Glaser and Strauss 1967). The author has been using the ATLAS/ti software for some steps of the data analysis, such as coding, search and retrieval, and building concepts.

## Preliminary Results

This research-in-progress paper shows the preliminary results of this investigation. These results have been developed from Café Madrid's experience. Figure 1 shows the significant concepts that emerged from the data analysis, and how they interact with one another. This framework is proposed as an initial formulation of this investigation. The two additional sites could add to or modify these concepts. Starting on processual issues, one goes chronologically through this process from left to right. Firstly, the project team, influenced by the kind and quality of training, configures and tailors the system. To help them to do this, two kinds of training are necessary: conceptual about how the system works and what its business implications are, and technical about the system's functionalities. Then, the system begins to be used by key-users and end-users, influenced by the kind and quality of training, and by the quality of knowledge transfer from the project team to key-users to end-users. This knowledge transfer occurs over time in a continuous way. In Café Madrid, users are often helped by other users to understand how to best use the system.

After the first implementation phase in Café Madrid, the system started to be used in its automating role. When the first users began to use the system for decision support and work integration, they found that some aspects of the previous configuration were wrong. They considered that some members of the project team did not understand the integration concept. As a consequence, re-configuration was initiated. Key users also decided that it was necessary to begin the rollout to warehouses for increasing the work integration from foreign warehouses to factory. New functionalities also started to be implemented after key users and end users understood and identified additional system's capabilities.

General speaking, given that the initial system's configuration cannot satisfy the key users and end users' requirements or given that new opportunities are detected, key users begin the ES continuous improvement cycle (ESCIC). Some of these improvements in Café Madrid's experience have been as follows: changing the initial configuration (e.g., tables, business definitions); creating new reports or improving existing reports, developing interfaces with third party products (e.g., human resources system); ES programming (e.g., program for checking the client's credit conditions); fitting business models and user roles (e.g., changing the distribution model from factory to warehouses to intermediaries); and implementation of new functionalities (e.g., executive

information system, distribution requirements planning, and statistical inventory control) and rollout to new facilities (e.g., warehouses and procurement centres). Hence, the ESCIC consists of ES configuration-tailoring process on the functionalities already implemented, and rollout and implementation of new functionalities. This is a virtuous cycle that expands the ES-use from the automating role to informating role through increasing decision support, work integration, and internal customer service around the whole organization. The main use of the system as automating tool has been to improve the control on the business processes. With respect to the informating role, the system has been used more extensively for decision support and customer service rather than for work integration. For decision support, the system allows users, for instance, to have information to justify decisions. For customer service, users feed the system with service orders to the ES outsourcing provider for, for instance, solving technical problems or tailoring



**Figure 1. Human, Contextual and Processual Issues Influencing on ES Use**

reports. Finally, some wrong aspects of the previous configuration and the lack of implementation of all functionalities of the system have originated an under-utilized system in its role of enabler of work integration.
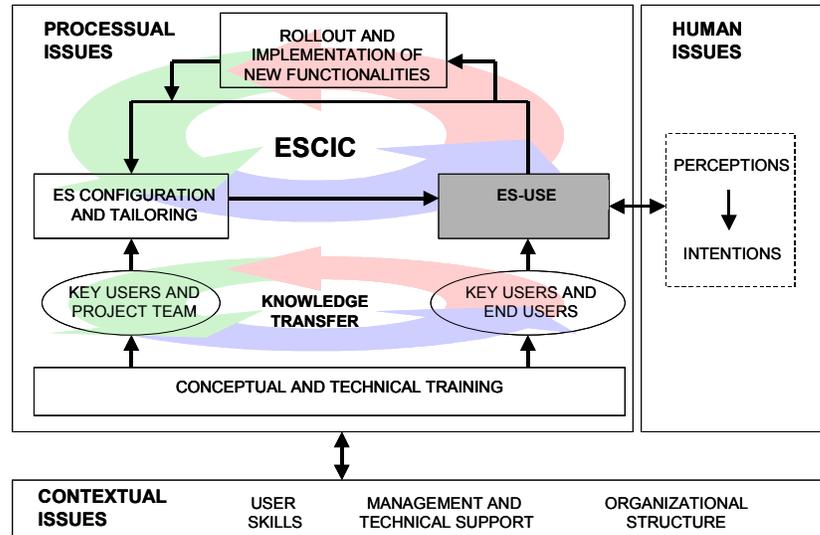
The whole process described above has been influenced by three contextual issues: organizational structure, management and technical support, and user skills. The ESCIC is led by a permanent team within the organizational structure: the User's Committee. This Committee is composed by key users of each business area, the higher management, and technical experts. In Café Madrid, the company's president has been the main sponsor of increasing ES-use. He leads the User's Committee. On the other hand, an ES outsourcing provider, as technical support, has developed the ES configuration-tailoring and the implementation of new functionalities. Finally, some areas have realized better improvements than others influenced by superior user skills. The finance users seem to understand better the integration concept and implications of an ES than the manufacturing users. This has originated more improvements, and ultimately, a more extensive use in the finance area than in the manufacturing area. The user skills that increase ES-use are as follows: understand and accept the integration concept, being a functional expert in their areas, having analysis capabilities and being a curious person. On the other hand, as the process evolves, it also influences on these contextual issues. For instance, more training and knowledge transfer enhance the user skills.

Finally, the whole process and the ES-use have been influenced by the beliefs of key users and end users (human issues). In some areas, such as Packaging and Quality, the system has been perceived by users as useless and difficult to use. Specifically, users explained that for carrying out a transaction they need to go through many screens. This is considered a complicated activity. As a consequence, these areas have decided to turn off the system or use it in few activities. The process and the ES-use also influence the user beliefs. For instance, in the Delivery area, more training and knowledge transfer from key users to end users changed early perceptions of the system as "a monster difficult of operating". In fact, after using the system, the beliefs of end users have changed to claims that the system enhances productivity. As a consequence, the use also increases.

## Discussion

The findings from the first site show that ES-use evolves in a virtuous continuous improvement cycle. Human, contextual and processual issues define the way as the use of the system evolves over time. As requirements are satisfied and new opportunities are detected, the system is used more extensively to perform more relevant functions than that of automating: decision support, work integration, and customer service. Two particular constructs are very interesting to mention: the role of key users and the user's committee in leading the improvement cycle, and the ES outsourcing as a practice for assuring permanent and qualified technical support.

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