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Enterprise applications diffusion within organizations: A social learning perspective

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A B S T R A C T

We used a social learning explanation to explain the diffusion of an enterprise application (EA) within an organization. We viewed the implementation of EA as a pattern of key users' behaviors to examine the effect of self-generated and external sources of influence. Such behavior is progressively developed over time. Our study was based on investigating two business areas in a single company. From our investigation, we determined that the key users' behaviors toward EA diffusion were influenced by both cognitive factors and organizational stimuli. Although the organizational environment was similar for both sites, one area performed better than the other in diffusing the system.

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1. Introduction

Enterprise applications (EAs) are a type of IS that are used in order to manage activity within teams or beyond organizational boundaries. This type of IS focuses upon the integration of business processes within organizations, allowing improved coordination among functional departments, business units, providers and with customers. EAs include ERP, CRM, KMS and Supply Chain Management (SCM). They are complex technologies because of their size, off-the-shelf approach, and the organizational, operational, and technological changes they introduce in organizations [3,5]. However, the high rates of failure of EA projects have resulted in a tendency to analyze this phenomenon from different management perspectives [1,10], as a cross-functional discipline that covers a broad range of management fields including IS, organization theory, human resources, accounting, and operations.

EA integration introduces new elements into the implementation process; it requires a single database and a modular constitution. Companies often implement EA using a phased approach in which each business area adopts either a set of EA functionality or just one that forms a complete business unit.

More importantly, it remains possible to implement complementary changes although the unit is already being used. Moreover, the adoption of EA in one business area may occasionally require changes in the legacy system. This raises the question: when does implementation actually end? Indeed, many EA projects are never completed. A gradual adoption approach thus requires a method to assess the implementation of an EA. Approaches following a technological innovation perspective [11], divide the process into several stages. Therefore, we felt that a complementary perspective was needed in order to effectively understand EA diffusion.

We therefore decided that the diffusion of EA within an organization could be understood as a social learning process in which the key users (those responsible for an organizational area) had to develop types of behaviors that helped the diffusion of the system within their business area; but what types of behaviors affect the final use of the EA? And what cognitive interactions predict a good EA implementation? We attempted to answer these questions using social learning theory (SLT).

2. Social learning theory: the foundation

SLT, also known as Social Cognitive Theory (SCT), has its roots in the work of psychologist Bandura; it is fundamentally learning by observing the actions of other people. It therefore involves three variables: the person, behavior, and the environment. The theory

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proposes that these three variables interact to explain individual actions (i.e. behavior).

Recently, VanSandt and Neck [13] described how the practice of self-leadership – as a construct derived from SLT – can be a relevant means to improve moral action in companies. The number of studies focused on the link between self-efficacy (a person's belief that he or she can perform a task) and individual reactions to computing technology is particularly significant.

Although the first steps in the application of SLT to IS may be apparent, there are a number of other ways to use SLT to explain IS diffusion. The application of SLT in IS studies has focused on just one of the relationships in the SLT model: that of a person's cognitive perceptions (e.g. self-efficacy) and behavior. However, the question of how the environment interacts with the other two variables remained unanswered. Furthermore, previous studies have focused on quantitative analyses, which make a broader study of social learning for IS phenomena using qualitative methods (e.g. longitudinal case studies) more desirable. SLT is a powerful theoretical framework that elicits a better understanding of IS transformation processes including gradual diffusion of EA.

3. Research method

Our study was part of a larger investigation of EA adoption and diffusion [6]. It accompanies a description and analysis of EA adoption and diffusion models. However, the motivation here was to explore the different levels of performance by and within companies. In one company that reported successful EA adoption, the authors found that the success originated in a specific single business area, whereas other business areas were performing quite differently. This led us to explore circumstances where the same environmental motivators were present in all areas, but where some areas were more successful. Thus our question was: why do EAs diffuse differently among business areas within the same company? This question led us to further study two business areas (sales and distribution, and logistics and manufacturing) in what we refer to as the Coffee Company (CC).

These two business areas, which had contrasting results, became our two sites for a multiple-case study. Studying two business areas within a company means that the company becomes the environment in which the phenomenon is observed. We selected the key EA user as our unit of analysis. The key user was the set of users who play a stated role in implementing the system and helping other users learn about the system. They were, generally, business-area managers.

3.1. Site description

CC is a national leader in the processing and distribution of roasted and ground coffee in a Latin American country and it has been exported green coffee to the USA and Europe since 1992. In the first years of the millennium, the company's annual earnings were about US$45 million and it employed 370 persons. Its supply-chain consisted of several procurement centers located in coffee regions throughout the country, a modern plant where coffee was roasted, ground, and packaged, a fleet of trucks to deliver products to regional centers, twelve regional distribution and warehouse centers which distributed its products to 11,900 retailers and forty-three independent intermediaries. CC has also a sales force of 35 persons, responsible for selling to more than 700 large retail destinations including supermarkets and chains.

The two areas under study in our investigation were logistics and manufacturing (L&M) overseeing the processes of procurement, manufacturing, and distribution of products between the factory and the regional distribution centers and sales and distribution (S&D) responsible for the processes of sales and delivery from regional centers to retailers. Each area had a manager who was designated as the key user for the diffusion of EA within his/her area. Both managers were in charge of a broad set of processes in the supply chain; they were responsible for the entire value chain.

3.2. Data collection and analysis

We recorded the process through a combination of real time and retrospective analysis. Frequent visits to CC were carried out over a period of three years. The primary methods of data collection were 41 semi-structured interviews, each lasting about 90 min, observation, and documentary review. The interviews were with people involved in EA implementation: the CEO, the CFO, functional managers, end-users, technical specialists, members of the personnel department, and EA consultants. We also observed several Key Users Committee (KUC) meetings – each dedicated to managing and evaluating the EA implementation process and lasting about of three hours. Direct observations were performed by an observer, who was introduced as a researcher sponsored by the CEO. Long-term observations took place in monthly visits: this minimized the effect of the observer on what was being observed. As a result, the agenda of KUC meetings was not influenced by the observer. At first, sketchy notes were taken by the observer, who then rewrote them soon after the meeting. Some training sessions were also attended. The analysis also included a review of documents focusing on memos, user manual, procedures, system manuals, and reports of earlier implementation phases.

An iterative approach of data coding and analysis was followed, focusing on the development of concepts and constructs associated with the social learning process and EA diffusion within an organization. Although these methods were initially classified following an open coding technique (i.e. as suggested by the data), the emerging concepts were re-organized to take into account "some potentially important variables" [8] from SLT. Specifically, the analysis consisted of three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification. We reduced the rewritten field notes to a more organized data set. To do this we used codes as labels attached to words. Then, we assembled and displayed data based on the SLT. The main displays we used were graphs and chronological loops. These allowed us to compare events among the two sites. Finally, we drew conclusions and verified them. Although conclusions were initially vague, they became explicit by iterating data collection, data reduction, and data analysis over time.

Once conclusions emerged, precautions were taken to corroborate the interpretations. We checked field notes during the writing process, got feedback from interviewees and from third parties (e.g., an EA consultant, two scholars, and people that participated in three research seminars). The three main SLT variables are extremely general and no previous conceptualization of them existed in the EA context.

4. Enterprise system adoption at CC

CC acquired its EA in 1997 by purchasing it from one of the top five vendors. A first set of EA functionality was installed between 1997 and 1999. This initially installed included features related to finance, materials management, sales administration and manufacturing. The first version of the system was installed and available for use in 1999. Since then the organization has been engaged in a process designed to diffuse the EA to support more organizational functions and business units. Our study was based on the implementation process between 1997 and 2002. In our