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SAP, Change Management and Process Development Effectiveness (II): Case Study
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Abstract

Last year, at AIS’98 (Pérez and Rojas, 1998), a series of variables was presented to measure the influence of change management on the effectiveness of the Information Systems development process. This proposal was based on the analysis of possible factors, which affect the Process Effectiveness dimension. The Process Effectiveness dimension is one of the four dimensions included in the Systemic Global Quality vision. The other dimensions included in that vision is: Product Effectiveness, Product Efficiency and Process Efficiency (Callaos and Callaos, 1996). This paper presents the results of a case study performed in a company of the oil-producing sector and is focused on measuring Process Effectiveness in the implementation of three SAP/r3 modules (Sales, Materials and Finance). The results participating in the process in roles such as the Leaders and End Users. No evidence was found on the rest of the showed that there is a correlation between the Change Management factor and Process Effectiveness in the personnel personnel - the technicians and functional users. This research represented a contribution to the organization subject to the study on the improvement of the Process Effectiveness for the development of its Information Systems.

Methodology

The methodology followed for this study included the following steps: the definition of the type of research, the selection of Information Systems projects, the definition of variables, the selection of measurement tools (interviews and questionnaires), the evaluation of the reliability of the questionnaire, the application of the tools, the analysis of the results and the drafting of conclusions.

Type Of Research

This paper presents facts that are of a non-manipulative nature that have already occurred, corresponding to a non-experimental type of research. The observation and analysis of real Information Systems development organizations implies that a field study has to be undertaken within that organization. Therefore, an exploratory study was proposed, aimed at determining possible relationships and trends among the socio-human and organizational aspects, as well as to the achievement of process effectiveness in the development of Information Systems in an oil-industry organization.

The Selection And Definition Of Information Systems Development Projects

In order to select the Information Systems development projects to be studied in this research, certain conditions must be considered such as the quality of the process, the satisfaction of the system user, the system’s delivery time and the relationships among the developers and the users. Therefore, the selection of the organization subject to the field study is important, where these and other conditions have to be met in the process of developing systems, so as to ensure an acceptable level of the remaining quality aspects. Another consideration is the size of the organization. The idea was to select an organization that would encompass the participation of various persons in the various systems development projects recently carried out. The last consideration was the need to count on the management’s commitment in order to guarantee the required cooperation and participation. The Fertilizers Business Unit (FBU) of a subsidiary in the Venezuelan oil sector was the organization chosen for this non-experimental research in an exploratory field study. It is important to highlight the relevance of the oil industry in Venezuela inasmuch as for decades it has constituted the country’s main source of income and it is evident that information services and telecommunications are vital for this sector.

The personnel participating in the Information Systems development projects are upper-level technicians and university graduates. The technology used for the development of information systems is client/server, Oracle-based and SAP fourth-generation program languages such as the ABAP. Structured techniques are used in the methodology for the development projects of Information Systems. However, in this case study the SAP methodology was applied. As regards the selection of an Information Systems development project, certain important considerations had to be taken into account. One is the willingness of the project leader to lend the necessary collaboration in this study. The location and availability of the participants in the development of the project are also important. At the time of applying the measurement tools of this study, it was necessary for the projects to have culminated or were about to, so that the information thereof would be more precise in the
interviews and in the definition of the measurement tool for the variables being studied. Once the organization had been selected and once the main characteristics of the systems development process in the organization had been analyzed, it was determined that the development project would be the project of the SAP (SAP/r3) integrated information system package, which was developed in three modules. SAP is a system for the integral management of administrative processes and data manipulation. This system enables companies to integrate their business processes at all levels within the organization. SAP/r3 works under a client/server computer architecture based on the use of microcomputers which is more user-friendly because it works in a Windows environment. The Pequiven FBU has been working under the previously-mentioned architecture for three (3) years, for which reason, the FBU was the first to implement the SAP/r3 within the corporation and has replaced the unit’s Information Systems with the new system. The modules include the following business process: Sales and Distribution management, Purchase and Materials management and Financial management. There is a technical leader and work team and a functional leader with his work team for each project module. The former covers technical needs such as connections, data coding, network infrastructure. The functional leader, in turn, manages all aspects regarding the area (or process) where the module is implemented.

**Definition of the Variables**

In order to go from the conceptual stage of the research to the empirical stage, concepts are converted into variables. Variables are presentations of the concepts in the research. For the purposes of this study, it is important to make an analytical distribution between dependent and independent variables (Namakforoosh, 1996). Dependent variables, according to V. Morles (Morles, 1986) are the effects that are studied or the variables that the researcher wishes to explain (Namakforoosh, 1996). Independent variables, in turn, are the possible causes or correlation of the effects (Morles, 1986). The supposition is that independent variables shall cause changes in the values of the dependent variable and that the differentiation among dependent and independent variables is strictly analytical and is based on the objectives of the research. The questionnaire measures the rest of the variables to be studied and is applied to the participants involved with said variables. The IS development Process Effectiveness variable and the Change Management variable shall be applied to all the members participating in the process of developing Information Systems, such as the project leader, the analysts and users comprising the work team and the end users. Other variables, such as product efficiency and effectiveness, shall be measured through the members of the work team and end users, inasmuch as they are in direct contact with the Information System. The Development Environment variable involves the entire work team who have the knowledge of the technology which has been employed, the hardware and the software, technical skills, etc. Lastly, Process Efficiency shall be applied to the work team and the project leader as the person responsible for the development process. Once the questionnaire has been applied, the results are supplemented with group discussions in order to define and clarify the results.

Experts in the field of Information Systems and Organizational Development revised the definition of the variables. Based on the definitions, the indicators for each dimension of the Systemic Global Development matrix were obtained. Each indicator was measured by means of one or more questions. The procedure applied to the questionnaire used in this study was the validation of contents.

**Reliability**

Kendall and Kendall (Kendall and Kendall, 1999) define reliability as a parameter of consistency. The Cronbach alpha coefficient was the method selected, insofar as it requires one single administration of the tool for the corresponding calculations.

**Analysis of the Results**

A summary of the results obtained is presented as follows:

6.1 **Change Management**. Charts N°1, N°2, N°3 and N°4 show the values of change management obtained in the measurement for the leaders, technicians, functional users and end users, respectively. Notice that the Finance module obtained the highest management values for all the members of the development team. However, the results of the two remaining modules were close.

6.2 **Process Effectiveness**. The Process Effectiveness variable is the dependent variable. Charts N°5, N°6, N°7 and N°8 show the values for the leaders, technicians, functional users and end users, respectively. The leaders obtained the highest values in the three modules for this variable. The highest value in the other development team members.
6.3 Change Management vs. Process Effectiveness. The following charts N°9, N°10, N°11 and N°12 show the relationship found between change management and process effectiveness for the leaders, technicians, functional users and end users. Only a relationship for the Leaders and End Users was found in the three modules that were implemented.

Conclusions

This paper collects the empirical evidence regarding the relationships among the Change Management factor and the Process Effectiveness dimension in the development of Information Systems. This evidence occurs in the Venezuelan oil industry sector. The data was collected on the SAP/r3 package implementation process for three modules: Sales, Finances and Materials. It was determined that a relationship exists between the Change Management factor and Process Effectiveness in the personnel participating in the process in roles such as the Leaders and End Users. No evidence was found in the rest of the personnel - the Technicians and Functional Users. This research represented a contribution to the organization that underwent the study in the improvement of the Process Effectiveness in the development of its Information Systems.

References