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CONTRIBUTIONS OF THE PMBOK TO THE PROJECT MANAGEMENT OF AN ERP SYSTEM IMPLEMENTATION

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The implementation of Enterprise Resource Planning (ERP) Systems has become generalized in companies and organizations, as a way to achieve supply chain integration, improve productivity and gain a competitive edge. Those implementations, more than simple technology projects, have revealed to be complex and time-consuming business projects, due to the structural and behaviour changes involved. This article analyzes, under the Project Coordinator's point of view, two real cases of ERP implementation projects at Ibico Portuguesa, today ACCO BRANDS PORTUGUESA, comparing the project management methodology adopted by the company to the Project Management Body of Knowledge (PMBoK). The conclusion was that the Project Manager's use of PMBoK norms and best practices was probably a success factor in those implementations, particularly referring to the elements that have been pointed as the most critical: planning, top management involvement and commitment and stakeholders' management.

Keywords: Enterprise Resource Planning, Project Management, PMBoK, Top Management Involvement, Stakeholders ´Management.

1. Introduction

An Enterprise Resource Planning (ERP) System is a software package that allows an organization to manage the effective and efficient use of its resources, including materials, people, and equipment [1], [10]. An ERP system covers a great variety of functionalities in an integrated manner. The ERP most important attributes are the automation and integration of the main business processes, the capability to share data and processes throughout the whole organization, as well as the production and access to on-line information [2], [8], [19].

The functionalities of the ERP modules offer a generic solution that covers generic processes. However, the solution is configurable, to a certain extent, in order to allow the ERP system adaptation to the organization's specific processes. Therefore, the implementation of an ERP System consists in finding a compromise between the functionalities available in the ERP and the company's business processes [5], [9]. In that sense, Parr [14] distinguishes 3 ERP implementation categories – “Comprehensive”, “Middle-Road” and “Vanilla” – and describes their implementation characteristics in terms of physical scope, business processes re-engineering (BPR), technical scope (modifications, customizations), module implementation strategy and resource scope (time and budget). This taxonomy allows top management to understand, at an early stage of the process, the dimension and implications of the project they intend to involve the company into.

In ERP systems implementations, the following critical success factors (CSF) are frequently pointed out: top management commitment, project team, clear scope and objectives, project management, change management, training, sponsor’s commitment, implementation model, minimal customization, performance appraisal, expectations management, as well as hardware and software package tests and problems resolution [5], [15], [7], [20]. The critical analysis of those CSF, as well as the management and monitoring of the associated risk factors [6], is presented by some authors as a must in order to avoid compromising the result of ERP

implementation projects [7], [13]. From those critical success factors, the poor management of the implementation process is considered as one of the main reasons for unsuccessful ERP implementations [21]. The complexity of an ERP implementation, that involves technical hardware and software issues, as well as organizational, human and political issues, requires new project management skills [3], [11], [12]. Due to the technical complexity of the system itself, the ERP implementation process is complex and demanding in terms of resources, therefore requiring adequate and careful management, based on solid knowledge and precise project management methodology .

Thus, next follows a presentation of the case study and the research method, followed by an analysis of the results of an ERP Project Management according to the PMBok at Ibico, a multinational company in the office products business.

2. Case Study

2.1- ERP Implementation at Ibico

The case study is based on two projects of the BPCS (Business Planning and Control System) ERP implementation at the multinational Ibico Portuguesa. The two projects implemented, though different in contexts and scope, were linked, with the second being a second implementation wave of the first one, with the inclusion of additional financial modules.

The methodology used in the first project was a mix of two methodologies: the Proven Path, developed by Oliver Wight for the MRPII concepts implementation, and the BASIS methodology developed by SSA, the BPCS software provider, being BPCS the tool selected to apply those concepts.

The methodology used included the following sequenced activities:

- Problem analysis and evaluation of alternatives;

- Cost/Benefits Analysis;

- Elaboration of the Project Definition Memorandum, including scope, motivations, objectives and organizational model of the project as well as project plans;

- Execution of the implementation activities identified in the plans, related to strategies and processes definition, training, system installation, prototyping, prototyping conclusion, development and confirmation through a Conference Room Pilot, data preparation, go live and operation of the new system;

- Monitoring and control through a daily report to the “Torch Bearer” and a monthly report to the Steering Committee;

- Project closure.

In the second project, being a complement of the first one and also due to the reduced lead time for implementation, a very similar methodology was adopted, though significantly simplified in terms of project execution, since the processes definition and training were performed as a single activity.

2.2- Research Method

Narrative inquiry has been defined as "the symbolic presentation of a sequence of events connected by subject matter and related by time" [19]. Narrative inquiry entails the documentation and analysis of individuals' stories about or personal accounts of a specific domain of discourse. As Swap, Leonard, Schields, and Abrams have suggested [21], employing research where participants relate stories about their personal experiences "would be more memorable, be given more weight, and be more likely to guide behavior".

The narrative inquiry method allows the research participant to tell his or her own story. According to Tulving [23], episodic memory relates to events which have been directly experienced, and it is these events which are most readily remembered.

Considering that we want to demonstrate that the project manager's knowledge and use of the PMBok are success factors in ERP implementation, we chose the “Narrative inquiry” for research method, applying it at two distinct phases:

- Initially, the manager was asked to describe her experience as project manager of the ERP implementation at Ibico, without any knowledge of the PMBok;

- in a second phase, after a course in PMBok, she was requested to interpret her experience at the light of the PMBok concepts.

In the first phase of this narrative inquiry, a series of interviews were conducted and the documents produced during the project were analyzed, in order to document the manager's interpretations of her experience with the project. In the second phase, the manager interpreted her role as manager of the ERP implementation at Ibico, based on the characteristics of the activities proposed in the PMBok phases.

3- Analysis Results of an ERP Project Management according to the PMBok

3.1 - PMBok – A Guide to The Project Management Body of Knowledge

The PMBoK considers the best practices and includes proven and efficient methodologies of project management, defining a project as a temporary, unique and progressively worked out initiative.

According to the PMBoK, project management refers to the application of knowledge, skills, tools and techniques to project activities to meet the project requirements [16], [17], [18].

The Project management work requires a balance between the various elements competing in the Project, elements considered in the nine knowledge areas proposed by the standard: Integration Management, Scope Management, Time Management, Cost Management, Quality Management, Human Resources Management, Communications Management, Risk Management and Procurement Management. The processes covered by these areas are mapped in five process groups: Initiating, Planning, Executing, Monitoring/Controlling and Closing.

The PMBoK does not define a rigid life cycle for a project but identifies a typical sequence of phases that include the process groups above referred.

In the Conception phase (Initiation), the focus is on the identification of the problem and its solution, the project, the evaluation of the project economical viability and a preliminary estimation of its costs, in order to decide if the project is feasible and executable. If the project is approved, this will require the organization´s commitment to the project initiation and execution. This phase includes the Initiation processes: the Project Charter and the preliminary scope statement development.

In the Definition phase (Planning), the focus is on the solution. This means to conceive and maintain an executable scheme to meet the business requirements that the project intends to respond to. This includes the definition of the users' and system requirements, the conception of an initial planning of the organization and the project, until getting to the specifications of the objectives, and a detailed work plan able to guarantee the execution of the project and obtain the expected result or product.

This phase considers the core processes of the Project Management Plan development, the Scope planning and definition, through a progressive hierarchical decomposition of the product (Product Breakdown Structure) oriented to the project deliverables, a hierarchical decomposition of the work (Work Breakdown Structure), activity definition and sequencing, planning of the resources required for the activities, costs estimation, estimation of activities duration, schedule development and cost budgeting (bottom-up costs aggregation). It also considers supporting processes,

such as: Human Resources planning, Quality planning, Communications planning, Purchases and Acquisitions planning, Contracts planning and Risk Management planning, including risk identification, qualitative and quantitative risk analysis and planning of the response to the risk.

The Acquisition phase (Execution and Control) focuses on the system development and installation. It considers the Execution, the coordination of the resources for the plan implementation, as well as the Monitoring and Controlling of the project, to guarantee that the project objectives will be achieved. The execution includes system design, production and implementation through users' training and acceptance tests. In this phase, the project performance has to be measured on a regular basis to identify major deviations to the plan that might compromise the project objectives, and allow corrective measures and even preventive action to be taken, in anticipation to potential problems. Therefore on one hand, execution processes stand out, such as leading and managing the project execution; quality assurance; acquiring, recruiting and developing the project team; distributing project information; requesting offers and selecting suppliers. On the other hand, monitoring and controlling processes involving the project work, changes, scope, schedule, costs, quality, project team management, project performance reporting, stakeholders' management, risk monitoring and control, contracts administration, processes based on the use of metrics, variance and performance indices of the Earned Value Management system.

The last phase focuses on the Operation (Closing) and considers the formal acceptance of the project, which means product delivery or project result and project close.

3.2- Analysis Results of an ERP Project Management at Ibico

The data collected was analyzed based on the characteristics of the activities proposed in the PMBoK phases, in order to identify the reasons why some of them have not been accomplished.

Regarding the conception phase (Initiation), and after an analysis of the two ERP implementation projects in the light of the Project Management Body of Knowledge developed by the PMI, we can conclude that, in both cases, top management paid a careful attention to the Project. As in many organizations, struggling with limited resources, Ibico top management showed concern about analyzing the problem, identifying alternatives and solutions, estimating the costs and benefits, as well as validating the project feasibility. Even though not appealing to more adequate techniques and tools, which could have facilitated a better estimation of the investment and its return, the evaluation was the starting point for the project initiative. In both projects, objectives and project scope have been defined, even if too extended in the first project, as well as an organization model was identified, even if too complex in the first project. In the first initiative, the objectives were too ambitious, taking into account the lack of skills among internal resources, in terms of both project management and integrated information systems. Ibico went from programs running on individual PCs to a completely integrated system, which required the implementation of new processes based on the MRPII concepts (also new at that time). The Initiation phase was relatively well developed.

Regarding the Definition phase (Planning), we have to recognize that it was conducted in a deficient manner. Even based on proven methodologies developed by the companies involved in the project, lacunas appeared at the beginning, with the product analysis – the Product Breakdown Structure (PBS) – which did not exhaustively identify the deliverables and milestones of the project and, therefore, did not allow an adequate and complete decomposition of the work – the Work Breakdown Structure (WBS) – in sequenced activities that can be managed,

measured, monitored and controlled. The planning was also deficient for not appropriately considering Time and Cost management, staying at the determination of execution windows, without allocating quantifiable and quantified resources to the activities, and also staying at the identification of the “visible” costs of the project, forgetting to quantify the costs of the resources allocated to the project and their management, and in consequence sub-estimating the total cost of the initiative. However, in the second project, the initial project was completed with other documents that allowed a better monitoring and controlling of the project, even without a complete integration of the activities, deliverables and milestones in a unique document. Planning also did not approach, or only in an incomplete manner, the aspects related to Quality, Communication, Purchases Management and Risk management; in fact, during the project execution phase, some of these elements were considered, though in an incomplete manner. This definition phase is the most complex of the whole project, and requires more time and attention in its development. This is an essential phase which will determine the project result – its success or failure. It seems that, in both projects, this phase merged with the Initiation phase by not standing out the planning activities in a separate phase itself. So, it was wrongly assumed that the project starts, after being initiated, with its execution.

We can conclude that a planning supported by a proven Project Management methodology is essential to the success of any project, either being of an extended scope, as in the first wave of Business Planning Control System (BPCS) implementation, or more concise, such as the Financial Modules implementation, either *Comprehensive* or *Vanilla*. Methodology is essential here; therefore, the development of adequate and complete planning is a guideline for the implementation of good practices and methodologies towards success.

Regarding the Acquisition phase (Execution and Control of the project), due to the lack of good planning, an Earned Management Value system, which allows, during the project, to report in a concise and consistent manner the project performance and forecast the project completion date and cost during its execution, could not be implemented. In both projects, monitoring consisted in a simple evaluation of the

completion percentage, allowing only identifying the progress of the project, but not to forecast neither delays nor variances in terms of costs, and then proactively take corrective measures. However, we can consider that, in the second project, there was an improvement related to changes control and management and risk monitoring, although not referred in the planning phase.

In the second Project, a formal Project closing took place, contrary to what happened in the first project, where it was not considered in a timely manner that only part of the objectives had been achieved. Therefore, at an early stage, a re-evaluation of the financial area should have been done and a new plan proposed for implementation, creating this way a separate project.

Comparing those two projects, apart from the differences above identified, two other aspects have determined their result; failure in the first case and success in the second: top management commitment and *stakeholders'* management. In the first project, top management represented at the "*Steering Committee*" often showed disagreement regarding the project orientation, causing conflicts and obstacles to the progress of the project; in the second project, the top management involvement was firm, incisive and effective, raising questions and issues in a clear and objective manner, focusing on obtaining results. Based on the experience of the first project, marked by a strong resistance to changes, in the second special attention was paid to the stakeholders' involvement, in order to break resistance, to empower, and to motivate towards the achievement of the expected results. It was hard, a daily fight for 3 months, fight from which the project team came out tired but as a winner!

4. Conclusion

Considering the characteristics of the ERP implementation projects and the potential of the PMBoK presented in point 1 and 3.1 of this paper and the critical analysis of the Ibico case study in the light of this framework, we can draw the following conclusion: the project coordinator's understanding and application of the

PMBoK might have influenced its managing role regarding the elements which revealed as the most critical: planning, that needs to be adequate, accurate and complete; effective top management involvement and commitment, and stakeholders' management to break resistance, motivate and compromise towards success.
Thus, the understanding and application of the PMBoK concepts by the Project manager and the skills acquired in other development Projects are, without doubts, success factors for an ERP implementation.

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