ERP Adoption in the Hotel Industry: How Software Implementation Becomes Development

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Abstract--**Integrating operational and managerial activities, Enterprise Resource Planning (ERP) systems are strategic tools to get a better market position, reduce costs and raise process efficiency and service quality. This case study aims to explore further the barriers that arise during the implementation of these systems, particularly in the hospitality industry. We found that the main reason for adopting ERP is the need for better-centralized control in a naturally decentralized network of hotel units. We also explore the difficulties in integrating different software packages and adapting the operational routines to them. As the case shows, the company bought an ERP, but it lacked essential functionality and required further and difficult integration with other software. Commercial ERPs do not yet fully meet the operational requirements of the decentralized network hospitality company. The intended implementation actually becomes a system integration development.**

I. INTRODUCTION

Considered a technological phenomenon, ERP systems have evolved a lot since the 90s, seducing and influencing organizations from various sectors with their packaged solutions, leading all kinds of companies to make real revolutions to conclude its implementation.

In the hospitality and tourism industry, the use of Information Systems (ISs) is increasing at operational level in attempts to ensure excellence in customer service processes and controls for administrative processes. At a managerial level, they provide better cost management, demand forecasting, service quality and customer satisfaction [14].

IS implementation necessarily results in organizational changes [13], affecting operational activities, information flux, decision locus, power distribution, managerial styles and sources of political influences. Moreover, during project implementation, a company must closely follow those changes in order to ensure good results to their customers. Conversely, these change's poor management usually impacts spent time and money.

This paper focus on the challenges of ERP implementation and the problems experienced by a Brazilian hotel chain. We show the difficulties faced and the solutions adopted. Then, we proceed to analyze which factors, among those in the literature, contributed to the undesirable results.

II. LITERATURE REVIEW

A. ISs and ERPs definitions

> *"An information system can be defined technically as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making and control in an organization.*" [13]

ISs were aided by the development of information and communication technologies, making the analysis one implicitly linked to the other [3]. In this way, besides the technical definitions (which are well known and easily provided by many software suppliers) others aspects, such as the acceptance of the final user and changes in the organizational structure (policies and decision making hierarchy) are becoming increasingly important. [17]

On the other hand, ERP may be defined as a particular IS solution with some individual characteristics [10]:

a) it originates with a commercial solution;
b) it is an application software, configured to support all business functions of the enterprise;
c) it uses on-line client-server transactions, with a centralized database and friendly user interface;
d) it is a standard software package, which can be tailored with addition of diverse modules. The customization of the software with the enterprises´ needs consists in the configuration of the transactions between this modules.

The commercial approach of ERP, with a core technical architecture, to which various modules can be attached and tailored to the enterprises' needs, changed the initial conception of ISs development. The configuration of the database, the development of transactions and the graphical interface is pre-configured in ERP solutions, transforming software development into an implementation.

B. Challenges of ISs implementation

According to the last report published by the Standish Group [20], only 39% of actual IS projects are completed successful. Despite of the various controversies surrounding the methodology of the research [6], the results of "challenged" projects, is still high, at the level of 43%. This category of projects includes those who exceed the time, the budget, and those that were closed with scope and features reduced. Otherwise, this level of partially successful projects ("challenged") is lower (20%) if considered only small projects, which demonstrates the impact of complexity and coordination needs.

This finding is representative, given the constant evolution of related project management studies and the progression of available technical solutions for its implementation, reducing the technical risks of the project [18].

Since these reports, several studies have been published which list, categorize and sort more visible failure factors for professionals working in project management of ISs [9], [16], [18], [19], [22], [23]. Using those results, we created a list of 24 critical failure factors, which served as the basis for questioning our interviewees (Table 1).

One framework was developed [23] analyzing failure factors according to three inter-related groups:

a) the strategic group, the highest level stakeholders, manage the requirements and scope of the project (process orientation group);
b) the second is the group of context, filled by IS users and customers, representing the issue of social adaptation of the organization and
c) the last group is a technical one, the project team; and represents the content of implementation.

C. Difficulties in ERP implementation

Despite many publications, there is still doubt about the gains in productivity and competitiveness and operational excellence provided by these systems, if compared to the impacts on organizational activities during their implementation [21]. Reference data [5] attribute these failures to the complexity of deploying these systems, which requires time, money, expertise and solutions to specific problems related to the enterprises´ business. If mismanaged, expected IS benefits may not materialize, reducing the operational flexibility, which may encumber a company for years [7]. In short, companies do not reconcile the technological nature of these systems with the businesses´ needs. It is a misunderstanding that the application of a new technology is just implementation. In fact, it is a dynamic extension of the innovation process, involving the constant adaptation between technology and the environment in which the company is inserted. Thus, implementation is innovation [15].

Similarly, other factors in addition to the technological factor must be considered, namely [1]: project management factors, top management factors, organizational factors, complexity and factors regarding size and process.

D. Previous studies addressing ERP in the hospitality sector

Despite growing adoption of ISs in the hospitality sector, there is still scant literature on the topic [14]. The major investments in ISs are intended to improve the client relationship (sales and marketing), mainly though web solutions. Other solutions involve the use of systems analytics to gather and analyze-customer behavior and trends.

This pattern reflects the need for service innovation and points toward the most competitive advantage of the sector: proximity to the client [11]. ERP solutions, or any improvements in operational processes perceptible by the client, on the other hand, are rarely cited.

Reference [2], describes a partial, but successful implementation of ERP in a hotel group, pointing some difficulties faced during on-line integration and the coverage of all available modules. As a result, some specific processes remained in the legacy system. Another study into the Israeli hospitality industry points out not only the lack of application integration but also the absence of ERP packages specially designed for hotels. The research findings, obtained in 2001, reveal what appears to be a global problem in the hospitality industry. Even today the situation remains the same [8].

As seen in the above, the cross-over of integrated solutions such as ERP (adapted from industrial applications), is not seamless when applied to services intensive sectors. Similarly, the degree of customization offered by ERP solutions packages seems to be somewhat lacking, making adaptation to the requirements of these sectors difficult.

III. METHODOLOGY

We used a single case study [24], representing an in depth analytical qualitative approach, without interference from the researchers. The case's central unit of analysis was the process of implementation of the ERP system and the integration with different software packages in Sigma Hotels (a fictitious name given to the Brazilian hotel chain studied).

The case was chosen for convenience; one of the authors was an employee of this hotel chain during the ERP implementation (and consequently has a broad network of contacts there) which allowed easier access to interviewees and thereby streamlining the data collection process. Despite study subject information confidentiality undertakings which prevent us from disclosing the company name and other data, this paper aims to present the case without loss of relevant content.

The study followed a protocol designed specifically for the case. Data collection was guided by a questionnaire elaborated with distinct sections:

a) characterization of ERP implementation;
b) dynamics of ERP implementation and
c) analysis of the challenges that arose as a result of the implementation ("challenge factors").

In this last section, each of the 24 challenge factors of implementation, described in the literature, were surveyed and confirmed individually. The analysis was made using the development of case description strategy.

As the issue involves a delicate subject, it proved difficult to engage in frank discussion on the topic. Even from the viable contacts that could contribute to the selected research case, the approach was conducted in the time that respondents allowed access to information, sometimes achieved after several attempts and insistence.

The interviews were conducted in November and December 2013, either in person or via phone or e-mail. Five users and non-users were interviewed, which each interview taking an average of 2 hours. Interviewees were also approached on several other occasions when it became necessary to obtain drawings or answer specific additional questions. All the interviewees were employed at managerial

level, directly responsible for the ERP implementation in one or more of the three positions described in the literature [23]: stakeholder, implementation team and user team. The data collection process was finalized after satisfactorily meeting the objectives identified by repeating the main facts and supplement composition of the views presented.

IV. CASE STUDY DESCRIPTION

A. The Brazilian hospitality sector

Hotel demand in Brazil will increase significantly when it hosts the 2014 FIFA World Cup and 2016 Olympic Games. The Brazilian hospitality market today is undergoing strong growth. Investors and hotel chains have been investing in new hotels, expansion and refurbishment. According to Ref. [12], the hotel sector shows nationwide growth. By 2015, over 422 new hotels will take the countrywide total well in excess of 9,000 and add a further 70,531 new rooms to 450,000 currently available [4].

Forecasts predict that the Brazilian hospitality sector should generate substantial revenue and more profitability for the hotel chains in the coming years. The spurt of new technologies has led the hospitality industry to change the way business is managed in this sector. Therefore, adopting new technologies became crucial to process transactions and improving quality of service. A combination of process changes and use of advanced technology can help to gain better control over operations and sales and to strengthen relationships across the value chain to retain customers and win new business.

B. Sigma Hotels overview

Sigma Hotels is currently one of the largest hotel chains in Brazil. The organization has an exclusive contract with a leading global player which offers different brands and hotel categories, such as economic (limited service), mid-scale (three stars), upscale (four stars) and luxury (five stars), for corporate tourism all over the country. *Sigma* Hotels was the result of a merger and has adopted new guidelines and policies, a strong set of corporate governance practices to improve the corporate performance and accountability in order enhance and protect stakeholder value. Aggressive strategies to achieve good positions also have been added.

V. ERP IMPLEMENTATION PROJECT

A. The scope of the project

One of the greatest changes that this merger has brought to *Sigma* Hotels (and is the primary focus of this study) was its decision to replace their legacy systems for an ERP in 2008. *Sigma* Hotels envisaged the implementation of the ERP would enable establishment of an integrated organization with absolute control over the hotels operations, implementing centralized financial functions to unify, standardize processes and enforcing better control to increase efficiency. Moreover, the chain believed it would also enable data access in real time, consolidation of financial data and facilitate sharing of information between the hotels and the corporate office.

Before adopting an ERP, *Sigma* Hotels used a non-integrated system. Although these legacy systems offered a simple interface and were easy to use, they were unable to process operations data safely or consolidate information in real time. Some limitations such as security threats and difficulties in upgrading were recognized by the organization. In addition, due the bureaucracy and complexity associated with tax obligations in Brazil, no alternatives were available that could provide full integration at that time. Thus, the organization had chosen to implement Oracle E-Business Suite Release 12 as a solution to management back office operations. Oracle was implemented using Oracle Application Integration Architecture with modules that control several functional departments. Fig. 1 shows the license agreement, including the modules and interfaces.

However, Oracle E-Business Suite doesn't offer coverage for all of the company's processes. Thus, the lack of application between front desk, food and beverage and ERP was filled through a Property Management System (PMS) and Point of Sales (POS) system. PMS systems are already a popular software application in the hotel industry outside Brazil and are used to manage front office operational and service functions (e.g., front desk, reservation, conventions and housekeeping). POS is used to manage food and beverage operations and inventory. Fig. 2 shows the structure of Oracle Application Integration.

BACK OFFICE		
Financial Applications	**Materials Management**	**Other Applications**
- Accounts Receivable - Accounts Payable - General Ledger - Integrated Receipt - Order Management	- Inventory - Fixed Assets - I-Procurement	- Human Resources Processes - Tax obligations - Cashier

FRONT OFFICE Interface	FOOD & BEVERAGE Interface
Property Management System (PMS)	Point of Sale (POS)

Figure 1: Module packages and interfaces acquired by *Sigma* Hotels

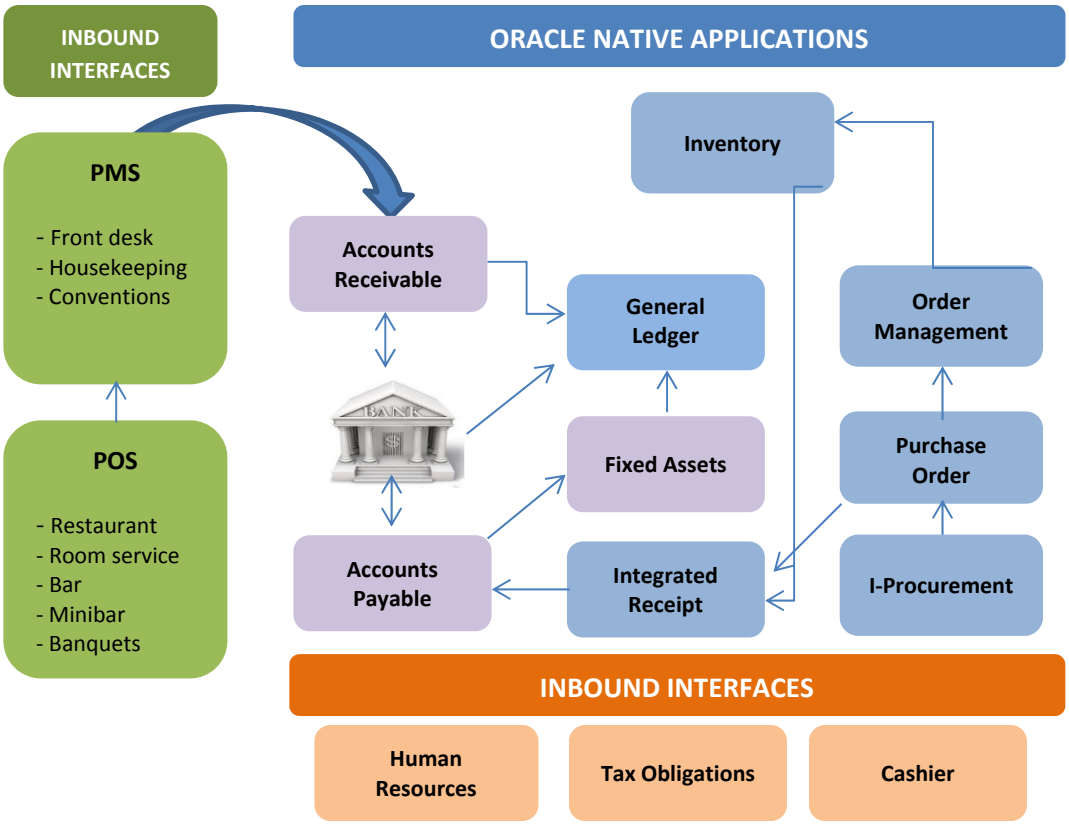

Figure 2: Oracle Application Integration

B. ERP selection process

Oracle E-Business Suite and interfaces were adopted without a formal selection process. The solution was recommended through the global partner that already had experience with system integrations in others countries. This system is known to work very well outside Brazil, in countries where the tax system is not as complex as it is in this country (Brazil). Two PMS solutions were presented by the aforementioned partner and after review and negotiations, *Sigma* Hotels selected the solution that offered integration functions between PMS and GDS (Global Distribution Systems) System. The chosen solution allows automated transactions between vendors and booking agents around the world. Furthermore, the selected solution provides a real-time connection between a hotel's central reservation system and PMS with the lowest booking fee.

C. The implementation project

The implementation was initiated at the end of 2008, encompassed around 30 hotel units all over the country and completion was estimated for the second semester of 2009. The project had a dedicated team of nearly 40 people who included the implementing supplier (recommended by Oracle), consultants (specialized in different Oracle modules) key users and *Sigma* employees. Project definition was made by a committee elected by the CEO and the CFO. They were appointed as the project sponsors and were responsible for overseeing the project. All activities schedules were prepared by a project committee and which included: planning, budget control, resource and project team, training and education, system testing, data conversion and "go live".

Project definitions were adjusted weekly by the committee. Any changes or modifications depended on their viability and subject to approval or rejection after evaluation by top management. The entire project was supported by a of program performance measures with some indicators such as project cost and compliance, outcome and efficiency in all hierarchical levels. *Sigma*'s goal was to convert 27 hotels within six months, an average of four hotel units per month (the number of hotel units varies according to location). This kind of implementation strategy, which targets the conversion of all systems, modules and interfaces at the same time, is designated as a "big-bang adoption".

D. Information Technology (IT) infrastructure

Before implementation, hotel-head office communications and data exchange were very limited due to a decentralized network of hotel units. *Sigma* Hotels decided to centralize access and the storage information system to a single data center. The organization invested heavily in modern equipment and software solutions to support the new platform. Despite significant investments at the corporate

office, the needs assessment of hotel units was compromised due to a lack of infrastructure and qualified staff in the IT sector in certain regions.

E. Design and development of systems

Despite the fact ERP systems often offer solutions and application software for financial areas, particularly in the hospitality industry, all modules had to be developed and adapted for hotel operations. To understand better the activities inherent to this sector, a key user team was assigned to analyze the hotel operating processes. A mid-scale hotel was chosen as the pilot project for development and testing of the new systems.

F. Training and education

Once systems development started, the training of end-users began. In order to include all end-users, two different periods were offered (morning and afternoon). Computer-based training units with the same interface as Oracle, PMS and POS were installed for practicing and learning. The average time spent for training was three days for both PMS and POS. Given the complexity of the ERP system, the average training time was five days. Some difficulties arose during training, attributed mainly to breakdown of communications between the team leaders and hotel units. Rumors and comparisons between the legacy systems and the new systems spread quickly. The lack of organization change culture and adaptability to change meant difficulties arose regarding acceptance of new systems and practices. Moreover, poor quality training and insufficient time spent on training and education contributed to the resistance to change.

G. Data migration

The data migration from legacy systems to new systems was performed using two different methods. The largest data volumes (e.g., accounting information, etc.) were transferred by consultants and the smaller ones (e.g., accounts payable, billing, front desk process, etc.) by personnel employed by the hotel itself. The hotel was prepared to convert all systems after midnight, with a downtime of around 2 to 3 hours, when the legacy systems were turned off and the new ones turned on.

H. Testing environment

After initial configuration, the first integration test results indicated integration failures between Oracle and PMS due to configuration errors (e.g., the PMS system generated data folders that did not export to Oracle properly). Furthermore, the Tax Obligations module proved incompatible with the release version of the Oracle system. These problems delayed progress and forced the project team to restart this phase and reconfigure the Tax Obligations module. Fearing more delays, top management made some changes in the project team. A super key user with more knowledge about hotel operations was included. Thus, the configuration phase had to be repeated with more detail and more rigorously. After extensively testing the system's functionality and integration, the milestone was reached. The unexpected interruption delayed the project schedule by almost two weeks and by which time all systems should have been converted. Meanwhile, many efforts were made to redesign the Tax Obligations module which needed to be finalized before "go live".

I. The "go live"

Top management had already identified the barriers and limitations that arose, mainly with Oracle, when interface errors and problems with the Tax Obligations module arose. Some issues, such as the tight schedules and political pressure did not allow the testing environment to be created in time for each hotel before each conversion. Thus, systems were converted without any documentation and validation which would prove the solution would be able to support the changes. Another point was the lack of assisted operation and poor IT infrastructure which aggravated the problem due to the difficulties of end-users. Several problems arose some days after the implementation, mainly in the financial area, which gave rise to problems in delays to accounts payable and receivable. The project implementation was completed on February 2010 concluding, therefore, the implementation project schedule.

J. Results and impacts of post-implementation

After "go live", it was observed that the hotel's financial divisions encountered many problems which centered mainly around the ERP system. The problems encountered during testing phase persisted during the production phase (integration difficulties and Tax Obligations module, which were not yet ready). Beyond the end-users, it became evident that project team members' knowledge of ERP systems was also lacking. Furthermore, the poor quality of data entered into the system before and after roll-out, produced a lot of junk files in Oracle system. The missing IT support before and after "go live" added to the operational difficulties. One of the biggest problems this created for *Sigma* Hotel was an 18 month delay in closing final accounts. Furthermore, ERP systems were not very well accepted by most of employees due to complexity, difficulties with learning and understanding the new system, many time-consuming processes, all of which forced the hotel units take on extra staff. In short, users were not prepared to assimilate the new work imposed by ERP. Software was not the main difficulty after roll-out. Such difficulties revealed that the hotels' infrastructure was not prepared for the changes. The needs assessments of each hotel units were not been appraised. That many of computers and the infrastructure were outdated was observed only a few days before implementation and this led to various technical problems.

The implementation of both the PMS and POS systems was considered successful. Despite a few glitches, the "go-live" and post-implementation did not affect hotel units' operations. Overall, the adaptation was easy due to similarity

with their legacy systems. New implementations were added to *Sigma* Hotel's project portfolio during 2010. The existing hardware, equipment and software systems IT infrastructure was no longer able to guarantee the efficiency of services and support the operations of new hotel units in the future.

VI. CASE ANALYSIS

In this section, we discuss the most relevant critical failure factors. The evaluations of interview responses are ranked by relevance in the Table 1. The respondents were asked to rate the degree of importance of each item. The answers were rated by levels of major difficulty from 0 – 10, using a scale of 0 = not at all important and of 10 = very important.

TABLE 1: CRITICAL FAILURE FACTOR FOR ERP IMPLEMENTATION

Rank*	Critical Failure Factors for an ERP Implementation Ordered by importance according to interviewers' perception	Top Management	General Manager	General Manager	Financial Supervisor	Systems Coordinator
20	Inadequate or poor quality of testing and troubleshooting. [16]	9	10	10	9	8
13	Unclear concept of the nature and use of ERP system from the users' perspective. Failure to gain the trust and approval and user acceptance. Lack of user involvement. Change management program and culture. Poor training. [16], [18], [19]	10	10	9	8	7
17	Underestimate complexity. Poor consultant effectiveness. Poor quality of Business Process Reengineering. High degree of customization. [16], [23]	10	8	8	9	9
24	Few immutable requirements. [18]	5	9	10	10	9
7	Incomplete specifications when project started. Technological scope changes. High turnover rate of project team members. [18], [19], [22], [23]	8	8	9	9	7
3	Poor leadership. Poor project management effectiveness. Reactive attitude dealing with problems. [9], [18], [19], [23]	10	7	8	8	7
4	No schedule with forecast of each executing project phase. No monitoring of the project status. Project deadlines did not correspond with the project milestones schedule. The lengthy delays at the early project stages were generally ignored and not adequately adjusted at later phase. [9], [16], [22], [23]	5	8	8	8	10
9	Absence of business case description. Inadequate or incorrect assumptions regarding project risks analysis. [9], [22], [23]	5	9	10	10	4
21	Changes should have brought business and operational benefits. [22]	8	8	7	10	5
2	Lack of documentation for the requirements, technical scope, performance and reliability. Success criteria have not been defined. Inappropriate definition of project scope and core objectives. [9], [18], [19], [22], [23]	6	8	8	9	6
6	Insufficient communication between project team and stakeholders. Conflicts among departments. Poor internal communication. [9], [18], [19], [23]	9	7	8	8	5
18	Political pressure. [16]	0	10	9	10	7
10	Limited knowledge, capability and poor project team skills. Teamwork below expectations. [9], [16], [18]	8	8	8	7	4
8	Insufficient or inexistent change management. [9], [16], [18], [19]	4	8	8	8	6
15	Low project team availability. [9], [16]	4	8	7	10	5
16	Culture based of fear. Top down management style. [16], [23]	0	8	9	9	8
23	Number of organizational units involved. [18]	0	8	7	9	9
22	Ambiguous business needs and unclear vision. [22]	2	9	7	8	6
12	Search for technical solutions. Inappropriate choice of software. Focus on technology. [16], [19], [23]	2	7	8	9	4
14	Stakeholders were not consulted about project requirements. Absence of stakeholder participation in the project meetings. Lack of commitment to change. [9], [22]	0	8	7	9	4
1	Poor support from top management. Absence of an influential champion and change agent. [9], [16], [18], [19], [22], [23]	0	8	6	7	5
19	Development division area. [16]	0	7	7	7	5
5	Low commitment of the team with the scope and phases of the project. [9], [18], [19], [23]	6	5	4	5	5
11	Project resources were allocated to others. Excessive costs. [9], [19], [22]	0	1	2	2	0

* According to importance described in literature and ordered by the Authors.

Some of the main causes listed in the literature as having a huge impact on IS implementation, such as "lack of support or commitment to the project by top management" [9], "project management and control deficiencies" [19] or "lack of user involvement and inputs from the onset" [23], were surprisingly ranked as low, which demonstrates that, in the specific case, some structural causes that commonly affect the successful of the project were well-known and managed during project development. Otherwise, some specific and more uncommon causes, such as "inadequate testing", "complexity underestimated", "poor consultation" [16] or "frozen requirements" [18], are applicable to some characteristics of the hospitality industry, or the solutions indicated to the problem of the case in question, indicating the need for a deeper, more detailed and contextualized analysis.

Above we examine fundamental the lessons to be learned from an ERP implementation process, its complexities, impacts and their applicability in the hotel industry.

ERP selection processes. The primary goal of *Sigma* Hotels was to replace their information systems within a year. The choice for an ERP was based on expectations that this type of system could meet all organizational needs at that time. No formal process was developed to evaluate different ERP solutions, suppliers or consultants.

The ERP selection happened with no evaluation criteria because the decision had already been taken and the systems would be replaced anyway.

Risks and complexities underestimated. The complexity and the risks involved were not considered by top management before implementation. The proposed solutions did not provide features and functionality that are necessary for improving hotel operations processes. The implementation project had an unrealistic vision and was overestimated by top management, which revealed that there was no guarantee that systems would work well.

Systems development. As the system could not support and provide the specific operating needs for hotels, further development was expected. However, the high levels of customization became a huge challenge to *Sigma* Hotels, which can be attributed to absence of prior knowledge of ERP systems in the hospitality industry and the lack of knowledge of this sector.

"Big bang adoption". Despite the high risks involved and the various well-known issues, the project team developed plans for a "big bang adoption". This method of conversion was a consequence of the decision to replace the all systems within a specified time-scale, concerns about additional project costs and political pressure. Moreover, since *Sigma* Hotels decided to replace all systems at the same time, it was not possible to make a "phased adoption", i.e. to convert in parts, because of the dependency among ERP modules and interfaces, which makes mandatory the implementation of all modules at once. In addition, hotel operations could not be interrupted.

The project team. Despite the large number of project members involved, results demonstrate several misalignments between the project team and business needs. While the IT team was trying to solve technical issues arising before and after implementation, they had to deal with huge pressure from top management to conclude the project; the end-users were trying to carry out their duties. Consequently, the daily tasks of back office became a nightmare. In short, the project leader was not able to provide support to the business changes, fast resolution of political and technical problems or promote interaction between distinct teams and stakeholders.

Change management and training. *Sigma* Hotel did not have adequate change management policies and procedures. Training was carried out before implementation, but end-users did not understand why their existing systems needed to be replaced. The change of the system has had a high level of rejection by end-users. During training comparisons and questions about the ERP and legacy systems were frequent. The managers of hotel units could have contributed to improving user acceptance but they were not included in the development processes.

Validation testing. Due to tight schedules the roll-out was conducted without certainty that the system could meet business needs, if it could produce satisfactory results, or even if would work properly. This contributed to a further technical misalignment when the project team skipped one of the most important phases of the project: development and the testing of systems.

When the implementation became a development. One of the major findings of this study shows that the needs of combining and integrating different systems, as well as the needs to review, adapt operational processes and empower users regarding the new system routines lead to the development of new solutions. Thus, what should have been an implementation, in fact, became a development.

Top management support. One of the main points was the lack of communication between top management and the project team. The failing was related to technical project issues, mainly regarding the issue of the hotels' operations, which were dramatically affected. Top management did not have full control over tasks and activities to be certain that the implementation was progressing in the right direction. The main processes were transferred to the project team and were not closely monitored and the distance between the two meant problems were not reported properly by the project team to the top management and which in turn created misunderstandings and completely unrealistic information. Consequently, several incorrect assessments were made and this shift of responsibilities led to operational disruptions. This is widely described in literature and might be the main factor for the challenges faced by *Sigma* Hotels. The current literature concerning top management commitment is clear, even for poorly explored studies or lesser-known applications. Finally, the success of a huge project depends on a strong, sustained involvement of top management and it

is important not to make the mistake of neglecting responsibilities of implementation projects.

VII. CONCLUSION

This case study brings valuable information to understand further ERP implementations and systems integration in addition to relevant factors influencing their success and possible failure. In the hospitality industry, ERP adoption is not a simple matter of changing software. An ERP implementation tends to have a high difficulty level, usually due to the profound changes in the companies' processes and organizational culture. It can be a daunting task. One that requires huge effort from all stakeholders. This is especially relevant in the Brazilian hospitality sector where network systems are naturally decentralized, thus making the adoption of an enterprise system a complex and challenging undertaking.

An ERP system does not offer applications to manage front office and point of sale operations, which forces hotel chains to adopt other solutions. The package offered by ERP suppliers as a strategic tool to gain competitive advantage, may result in the exact opposite: important disadvantage. This is essentially because it forces a number of customization procedures and requires the organizations to develop specific solutions to cover for their lack of functionality required by the hospitality sector.

As presented above, this lack of functionality on our case study brought about many difficulties and operational problems for the hotel chain. Thus, what should have been an ERP implementation became a systems development due to the need to combine and integrate different systems, as well as the need to review and adapt operational processes and empower users to execute new system routines. Moreover, one of the greatest impacts brought by the change was felt by the back office of the hotel units, causing an 18-month delay in closing the final accounts. This shows that for an ERP whose main functions implement back-office processes, the solution had a high level of dissonance between expectations and the reality of the implementation.

Those impacts could be attributed to the lack of clarity about an ERP implementation and the lack of top management involvement in the project. This study argues that top management involvement is a "*sine qua non*" condition for a successful ERP implementation. All the possible implications and impacts to the organization can and should be considered before the system adoption.

The reason why an ERP implementation could bring benefits and improve services and how this solution could affect the whole organization and its culture are two issues that also require careful analysis. Top management must be involved in every step of implementation, and not only as sponsors or as project supervisors. They also must take an active role in leading the change, as mentioned widely in the literature. Top management intervention is again necessary to mitigate many potential operational impacts and project risks whereas simply handing key problems and responsibility over to third parties is not recommended.

Thus, the lessons learned from the hotel chain in question contributes to the need to follow multiple criteria evaluations prior to the project' start, especially if there is no documented evidence of previous successful ERP systems implementations in your industry. Finally, studies into ERP implementation in the hospitality industry are scarce, which impedes us from concluding whether software solutions can be applied for this sector or not. This question has yet to be answered satisfactorily.

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