

Evolving the Enterprise Resource Planning System in Use to Improve Control Management

A Case Study in the Communications and Multimedia Services Trade

Joaquim Leite

Department of Business and Social Sciences
Instituto Politécnico de Bragança (IPB)
Bragança, Portugal
jleite@ipb.pt

Cecília Carmo

GOVCOPP research member
Universidade de Aveiro (ISCA-UA)
Aveiro, Portugal
cecilia.carmo@ua.pt

Joana Bernardes

Department of Business and Social Sciences
Instituto Politécnico de Bragança (IPB)
Bragança, Portugal
a34651@alunos.ipb.pt

Abstract — This research aims to understand how and why an Enterprise Resource Planning (ERP) system should evolve to improve management control. Having as supporting theory the ERP system, the holistic single case study method was applied in a communications and multimedia services trading company. Data collection was based on documents, participant observation and interview with the company manager. The main results showed the need to change the ERP system in order to allow disaggregating information to greater detail. Such disaggregation was evidenced for accounting reporting, costs per vehicle, costs per driver, non-financial performance per employee and performance per store. As an extension of theory, the need for management accounting to build disaggregated information and the interdependence of adaptive Information Systems (ISs) are reinforced.

Keywords – *accounting reporting; management control; Enterprise Resource Planning (ERP); communications and multimedia services trade; case study.*

I. INTRODUCTION

Over time, the controller function (management accountant) has assumed an increasingly relevant role in decision-making processes, assisting in the collection and interpretation of information obtained through the daily monitoring of activities [1]. These functions of management control systems fall within the necessary accounting and management reporting, including the assessment of organizational performance. Therefore, these systems are support tools to control, measure, plan and add value.

Improved management control practices can be achieved by standardizing common processes, integrating into a single Information System (IS), producing standardized reports, determining key performance indicators and providing access to information anywhere [2]. The technical skills of a controller, as a direct influencer in decision-making, are not only in the field of accounting, on the one hand, but also in the area of ISs, on the other [3].

Management accounting is a branch of accounting that, in itself and in its origin, is also an IS useful for management and the necessary accountability [4]. There are concepts, methods, rules and procedures of management accounting that are strictly in the domain of accounting as a social science. A computer engineer understands computing, hardware and software instruments and networks for data and information processing, functioning as a technological support already indispensable in all other areas of human knowledge: from mathematics to chemistry, from economics to medicine, from accounting to management.

It is true that the evolution of information technology is helping and facilitating the efficiency of the tasks of professionals in all areas of knowledge, including, of course, accounting and management [5]. It is widely acknowledged that information technology allows doing more and better in less time and with exponentially greater efficiency, even providing new theoretical and practical developments in other sciences [6]. However, it is also true that researchers and computer engineering professionals will never be able to absorb the theoretical and practical contents of other sciences.

The specific characteristics of each company and the way ISs are used are predominant factors for the adoption, implementation, use and changes in Enterprise Resource Planning (ERP) systems [7]. Companies can choose to purchase a standardized system, where there is no possibility of adaptation and organizational processes have to adjust to the system's functionalities. However, companies can also choose an adaptable system with the ability to gradually adjust to their needs. In this context, this research posed the following research question: how and why an ERP system should evolve to improve management control? To answer this question, a holistic single case study was conducted in a communications and multimedia services trading company.

This research work is structured into four main points, in addition to this introduction. The first is the literature review in the scope of management control practices and implementation and use of ERP systems. In the second point, the methodological process used is described and justified, starting with the definition of the research question and the sources for evidence collection, using the holistic single case study method. In the third point, the company under study is briefly presented, some collected data is exposed and some management control practices implemented in the ERP system in use in the company are described, identifying reasons underlying each practice and opportunities for improvement.

II. LITERATURE REVIEW

The evaluation of accounting earnings and performance monitors an organization economically and financially, putting accounting at the service of management [4] [8]. This information may be more aggregated (key synthetic indicators by major items) or more disaggregated, allowing the possibility of disaggregation, namely by transaction, by product, by type of client, by project, by geographical region, among others. This is the scope of management accounting that includes control practices, subsequent to the organizational practices of planning and evaluation. However, the optimal level of disaggregation is hardly generalizable for each and every context. Some literature has shown that management accounting information with lower level of disaggregation is the one that matters most for assessing financial efficiency [9].

With increasingly advanced information technology, organizations find new ways to improve data sharing and operational efficiency [5]. The evolution of technology for business management began with the Material Requirements Planning systems, as a way to meet the needs of controlling the quantities in inventory. This was followed by the emergence of the concept of Manufacturing Resource Planning, where resources were controlled in terms of production, finance and distribution, evolving, later, to the integrated management systems of organizations or ERP systems [7].

The level of competitiveness in the business world has a great impact on business activities, evidenced in the potential of ISs for performance improvement, cost reduction or customer loyalty, as examples [10]. These systems are already indispensable for most organizations and change the way data and information are collected, stored, processed and disseminated [11]. Any change in organizational processes needs to be aligned with change in ISs, particularly ERP systems

[12]. Such alignment between ERP systems and organizational structure is even a critical success factor in change processes [13].

ISs are so crucial to accounting and management control that they almost no longer function without the support of those technological systems [14]. But obviously, the implementation and use of an ERP system is always dependent on a cost-benefit analysis [15]. An investment in ISs developments or adjustments may stem from shortcomings seen in practice [16].

The use of an ERP system in a company can help it solve certain problems due to the fact that this system provides accurate and timely information, promoting integration between organizational departments [10]. The use of these systems can mean an increase in financial and non-financial capabilities. In this context, the concept of integrated reporting brings together financial and non-financial, operational and strategic information for management control purposes [17]. The potential of information technology impacts on organizational strategy [18].

ERP systems assist in the identification, integration and storage of information generated by the normal course of a company's activity and enable it to be shared both in an internal environment, with employees and managers, and in the external environment, with other agents and companies [7]. These systems are focused essentially on the efficiency of production, distribution and financial processes, aiming at optimizing both business processes and analytical capacity.

Commonly, the use of an ERP system is the basic support of the daily activities of companies to control the business processes throughout the value chain, upstream and downstream of the production of goods or the provision of services [5]. The use of these systems can positively impact on the efficiency of the financial management of companies, particularly in optimizing inventories, reducing personnel expenses, increasing sales and improving customer service [6]. This use also allows enhancing improvements in communication between employees, increasing organizational efficiency [19].

ERP systems provide timely information for managers' decision-making, bringing together information from various sources so that the decision-maker can visualize it and use it for innovation and value creation. Thus, increased productivity and/or efficiency, time and cost savings, improved performance, improved information flows in support of management, improved quality, process automation, elimination of redundancies and better ability to adapt to future changes are other advantages that have commonly been associated with the use of these technologies [20].

III. RESEARCH METHODOLOGY

It is common to use the holistic single case study method applied to the area of information and business systems management, including accounting systems, in very specific contexts [21]. This qualitative methodology is particularly suited to "how" and "why" type research questions, where the researcher has no control over the contemporary phenomena under study. In fact, specific contexts impact on accounting practices that control management, justifying the choice of the case study method for qualitative research [22].

The purpose of this study is to understand how and why an ERP system should evolve to improve management control in a company of a particular sector. This case study is of descriptive type and the company selected is from the telecommunications and multimedia services trade sector, whose management planning and control department has been using an ERP system for several years. The theoretical background is in the field of management control and ISs [5] [6].

Data collection was carried out through a triangulation between content analysis, participant observation, personal communication with two controllers and an interview with the current manager [21] [23]. Documents were obtained from the company's website, especially for a brief characterization. The writing notes obtained from participant observation and personal communication with the controllers resulted from the internship attended at the company by one of the researchers, between October 2021 and July 2022. This was the period to which the research refers. The interview with the company manager was taped and written [24]. These sources of evidence enabled the identification of the management control practices carried out through the ERP system, on the one hand, as well as the identification of limitations and opportunities for improvement, on the other.

IV. RESULTS: IMPROVING MANAGEMENT CONTROL THROUGH CHANGES TO THE ERP SYSTEM

This section presents the results of this case study, starting with a brief contextualization of the activity and presentation of the company under analysis in the form of anonymity, but without prejudice to the research. Next, the management control practices via the ERP system are addressed, highlighting the roles of the manager and controllers, the use of the ERP system and the suggestions for improvement in this technological tool for management control.

The company in this study is an official commercial agent for communications and multimedia services, dependent on one of the three largest telecommunications operators in Portugal. Since it is an official commercial agent, the company follows the guidelines and objectives communicated to it by the telecommunications operator. The objectives of the telecommunications operator are to provide innovative solutions in day-to-day life, through the development of equipment and services that are used in areas such as industry, medicine, education, leisure, culture and sports, among others. The services offered include mobile and fixed residential telecommunications, technology solutions (for companies and other organizations), services especially directed to young people and an internet site to provide products/services.

The company of this research has been developing its activity for over 20 years focusing on the North of Portugal, offering television, internet, telephone and mobile phone services, among others. There are several official commercial agents spread throughout the country, similarly to the target company of this study, competing with each other.

The current manager, who was interviewed, is in the company for just over 10 years, completed the characterization of the company according to the following excerpt: *“At this moment the company has six stores in the North (...)*

Considering the number of store operators, commercial agents and administrative staff, we currently have 36 employees and more than 2000 corporate clients are managed throughout the country. (...) The company is dedicated to five activities: 1) consultancy, preparation of studies or projects in the areas of telecommunications and new technologies; 2) identification, research, evaluation, development of products and services in the areas of telecommunications and new technologies; 3) import and export of goods; 4) supervision and management of other units of the group or company, namely in the areas of strategic and organizational planning, and finally, 5) provision of administrative services to the company's stores”.

One of the factors that most contributed to the implementation of the ERP system was the possibility of it being customized and adapted to the needs of the organization, as stated by the interviewee, highlighting the integration of the system: *“the ERP system is used as a customer base platform, allowing credit control, but it can be adapted according to the needs of the company”.* The ERP system functions as a customer and supplier account base, credit control, purchase/sales records, invoicing, reconciliation of accounts, credit notes, inventories, accounting (Standard Audit File for Tax - SAF-T) and human resources (personal communication in written notes, controller, May 2022). The system is an asset in terms of online information, digital support, large volume of data, information management, process automation and cost reduction as main advantages. The system is a valuable resource which main advantages are the supply of online information, digital support, large volume of data processing and management, process automation and cost reduction.

To improve the management control of the company, the ERP system in use should be provided with a tool that assists in the management of cost centers with regard to allocated vehicles. This limitation that substantiates the need for change in the IS was exemplified in the statements of the interviewed manager: *“(...) commercial employee X has car Y that has travelled certain kilometers, to which the costs of fuel, car maintenance and others are related. This way, we can evolve in a concept called cost centers per vehicle, where a certain percentage of time is associated to the use of commercial agent X and commercial agent Z, with the objective of determining the effective cost for each month. In this way, data relating to the income of each commercial agent could be associated with the costs per vehicle used”.*

The company's management planning and control department has identified problems with remote access to the ERP system. When several employees try to access the ERP server simultaneously, delays and access difficulties occur (personal communication in written notes, controller, May 2022). In addition to this controller's testimony, this was also confirmed by the interviewed manager: *“when an employee is distant from the server, it takes much longer and as the number of simultaneous users increases, the limitations also increase”.*

In terms of financial performance from sales of services, an increase in turnover has been observed in recent years. The controller, by means of a defined sales commission plan, records and verifies revenues, as stated by the manager in the interview: *“a controller records several transactions, verifies commission*

charts, confirms revenues and receipts, but the amounts are very aggregated and it is difficult to go into more detail for each sales process". This is yet another aspect that practical experience in the company identified as another limitation of the ERP system.

In terms of non-financial performance indicators, communication and teamwork were considered essential in the working environment (personal communication in written notes, controller, February 2022), justifying continuous improvements for this monitoring. In the interview, the manager ensured that "satisfaction, motivation and other factors of relationships between employees constitute important foundations for good interpersonal relationships, but not yet addressed in the ERP system for each individual employee". The manager added that "a good working environment contributes to increase productivity and achieve goals". In the same interview, the manager also mentioned that "the results of an external motivation barometer, applied to the stores of various official agents, classified the company as the best in group spirit, but without indicators for each employee". Therefore, this aspect is also considered a limitation to be improved in the future.

Schedule planning and preparation is a controller function whose limitations denote another opportunity for improvement. These shortcomings were mentioned by the controller (personal communication in written notes, May 2022), but the manager interviewed corroborated the following: "if the store managers' schedules were executed in a more specific program, there could be more efficient mechanization and better control over holidays, rest days and medical leaves, for example".

For the purpose of a better clarification of the deficiencies encountered by the professionals (manager and controllers) who have implemented and have been using the ERP system under study, the main limitations detected are presented in Table I below.

TABLE I. LIMITATIONS IN MANAGEMENT CONTROL PRACTICES THROUGH THE ERP SYSTEM

<i>Identification of limitations caused in part by the ERP system</i>
Costs of commercial vehicles aggregated and without the possibility of distinguishing between different commercial vehicles and different drivers/users
Delays and difficulties in remote accesses for communication and simultaneous use by a larger number of users
Marketing and sales costs aggregated and without the possibility of distinguishing accounting and management details associated with each sales process
Non-financial indicators (satisfaction, motivation, team spirit, others) inoperative or unable to distinguish each employee
Compliance with working hours without the possibility of controlling entries and exits for each employee and for each store

Despite acknowledging the advantages, controllers and manager addressed these shortcomings in the expectation of

improving the usefulness of the ERP system in the near future and consequently improving management accounting and control. In this sense, the interviewed manager ensured the following: "ISs are indispensable to management control procedures and there must be a change so that certain tasks are no longer operationalized manually or without the necessary rigor".

Table II summarizes the results obtained, whose evidence and explanation were presented in the previous paragraphs, distinguishing each management control practice, carried out through the implemented ERP system, associated with the underlying motivations and the respective opportunities for improvement.

TABLE II. CONTROL PRACTICES, UNDERLYING REASONS AND OPPORTUNITIES FOR IMPROVEMENT

<i>Management control practices in ERP (how?)</i>	<i>Underlying reasons (why?)</i>	<i>ERP improvement opportunities</i>
Commercial vehicle performance	Control the costs of commercial vehicles	Operationalize cost control per vehicle and per driver
Remote user access performance	Increase the number of simultaneous users	Operationalize more remote accesses
Performance in sales processes	Reduce cost of selling services	Operationalize registers/consultations by sale of services
Qualitative performance of employees	Control non-financial indicators	Operationalize indicators per employee
In-store activity performance	Control of store hours	Operationalize timetable maps per store

The opportunities for improvement identified, to be implemented in the short or medium term in the ERP system, mirror the main limitations that have resulted from the use of the system in recent years: insufficient vehicle control, insufficient number of simultaneous remote accesses, high aggregate sales costs, poor control of employee motivation and team spirit indicators and the absence of time control maps in each store.

V. DISCUSSION AND CONCLUSIONS

The purpose of this research was to find the best answer to the following research question: how and why an ERP system should evolve to improve management control? With a theoretical framework in the scope of management control and ISs, the case study method was applied in a company of telecommunications and multimedia services commerce in the first semester of the year 2022. The data collection was carried out by document analysis, participant observation and an interview with the manager.

The main results suggested some changes in the ERP system to overcome some of the limitations identified and to allow disaggregation of information for greater detail. This detail was

noted for records and consultations of sales by service, costs per vehicle, costs per driver, non-financial performance per employee and performance per store. This need for greater disaggregation of information on critical success indicators to better support decision making is in line with the management accounting and control literature [4] [8].

Monitoring controllers need more detailed reporting and management indicators to better assess financial and non-financial performance [1] [2]. However, this contradicts the literature that associates a lower level of disaggregation with financial efficiency [9]. This contradiction may only be apparent because it is associated with the strictly financial domain. In terms of management accounting, it is true that financial performance indicators are a consequence of management activities measured in non-financial perspectives: learning, growth, innovation, human resources, internal processes and customers [8].

In terms of ISs, these results reinforce that organizations continually seek to use more disaggregated information to improve operational efficiency and overall performance [5]. Such a search is also caused by the increasing level of competitiveness in the business world [10], assigning ISs a character of indispensability [11]. This corroborates the interdependence and continuous alignment between organizational processes, including accounting and management control systems, and ERP systems as a critical success factor [12] [13] [14].

In terms of limitations, the fact that this study is applied only to a single holistic case with a particular environment is highlighted. Additionally, the fact that the study was developed in an abnormal context of pandemic, high inflation and war in Europe can also be considered a limitation. Finally, another obvious constraint of this research is the anonymity of the company and the trade name of the ERP system which does not allow generalizing the failures and opportunities for improvement to all management software available on the market.

Future studies that may provide continuity to the present research are suggested, namely to develop new research applied to other companies, to other information technologies (blockchain, artificial intelligence, others), in different contexts and using quantitative research methodologies. Comparative studies are also suggested, involving competing management software, organizations of different sizes (small, medium or large) and from different sectors of activity.

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