

Research paper

Management Control Tools as a source of Competitive Advantage

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Abstract

Purpose: This study deals with management tools that boost business performance, especially those that represent a source of competitive advantage, and the integration of management tools with Business Intelligence (BI) platforms. Through the implementation of management control monitoring tools, these tools help in quick decision-making, boosting business performance.

Design/methodology/approach: This paper was based mainly on research, at the level of literature review and on the case study of a company. The case study phase applied, aimed to analyze, characterize, and propose a new approach to the current panorama of management control. The methodologies included the application of questionnaires, the observation of internal procedures and document analysis. The article consists of 5 chapters: objectives, literature review, research methodology, main results, and implementation proposal, in addition to the introduction and conclusions.

Findings: This project ended with a proposal for the implementation of the BSC and a business intelligence platform with direct applicability in the company and it proved to be a valid contribution for any organization that intends to implement the methodology, integrating with other existing systems.

Implications: The communication of the strategy and its proper implementation are fundamental for its success. Successful implementation depends on understanding the objectives and establishing a commitment to maintain and review the indicators and targets.

Originality/value: This study represents a significant addition to the investigation into management tools that boost business performance, which translate into a source of competitive advantage for companies.

Keywords: Competitive advantage; Management Control Instruments; Balanced Scorecard (BSC); Business Intelligence (BI); PowerBI.

1. Introduction

The project focused on the study of management tools that drive business performance and which ones translate into a source of competitive advantage. A window of

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opportunity for the integration of management tools with Business Intelligence (BI) platforms appears. Through the implementation of management control monitoring instruments, the intention of which is to face the rapid changes in the markets, denoted by a strong presence of uncertainties and volatilities today, these tools help the quick decision making, driving business performance (Wijethilake et al., 2017).

The current conjuncture of the markets, marked by volatility, competitiveness and turbulence, implies that companies are trained and predisposed to changes, inside and outside the organization, in order to overcome threats and acquire a competitive advantage. In this sense, the application of tools, such as those previously mentioned, becomes essential to ensure the alignment, control and implementation of the strategy, while enabling the control of its operational and strategic activities, and thus nourishing its long-term survival. Therefore, these management control tools play a vital role in the organization of companies, in their development and growth, as they provide managers with an overview of how their resources are used and how they are aligned with the strategy to be followed. Combined with good planning and control practices, this monitoring provided by the information systems allocated to the tools is crucial for the organizational capacity to face threats and market opportunities, realizing its objectives.

2. Study Objectives

The main objective of the project was to identify which characteristics of the management control tools best suited to digital applicability and the company under study, supported by recent publications on the subject by authors in the area of management control and strategic management, and so on, formulate a proposal to implement one or more tools, taking into account the advantages and disadvantages of each one, so that they can be integrated into the organization.

In addition to these aspects, it was intended to demonstrate how an organization can adapt management control tools in order to achieve greater reliability of data and information, in a timely manner for decision making. Another of the objectives of this project was, in addition to demonstrating the advantages of management control tools, to develop a specific management control system and what are the procedures and precautions to be taken in its design and implementation (Akroyd & Kober. 2019).

The project work focused on an industrial equipment company, which operates in a highly competitive and specialized market, which culminated in the ideal environment for the implementation of the tools.

In short, the purpose is to adapt components of the management control instruments and the implementation of one of the tools in digital support. That is, to understand the importance of each of the models and to understand which one's lead, the company under study, towards a sustainable competitive advantage using BI platforms.

3. Literature Review

3.1. Management

The formalization of "management" is relatively recent. At the end of the 19th century, Frederick Taylor proposed the concept of scientific management aiming at "a better way". This is based on the decomposition of elementary work gestures, timed and

organized to form a production line. Meanwhile, Henri Fayol proposed a similar approach, with more clarity and rationality, administration, and bureaucracy (Pindur et al., 1995). He believes that the price of the offer, the tools for continuous improvement, the layout of the facilities and the quality of supervision are as important as the quantity produced by the company. It brings the notions of a systematic work leader and the provision of monitoring by decision. It then recognizes the principles of management: planning, organization, control and leadership (Hartley, 2006).

The main functions of management are planning, organization, leadership and control. Managers have a responsibility to achieve their organization's goals, to take good initiatives and to ensure that all tasks are performed well within their organization. Management has its importance and therefore it is essential to study the management and use of its four functions for three reasons. First, it allows companies to become more competitive in the markets, secondly, it improves the quality of goods and services, productivity, and lastly, it provides basic knowledge of management concepts and techniques for recent graduates who wish to become managers (Geiss Jr, 2003).

Control is the last of the four management functions mentioned above. It is the process by which managers analyze the situation and ensure that the results achieved are consistent with the established goals. In addition, this step allows managers to make changes and corrections, as needed, to reorient the company in relation to its goals, if the objectives have not been achieved.

3.2. Strategy

The idea of strategy arises from the capacity of a leader to organize and direct military campaigns, which sees its origin in the ancient Greek word *strategia* (στρατηγία), which means the "quality and skill of the general". Over the years, its definition in dictionaries is defined with mentions related to political situations, wars or games, being linked to two or more competitors who dispute the same objective. Extrapolating this concept to business strategy, the battlefield assumes the position of a competitive market and, as in the basic principles in the military sphere, companies are strongly influenced by those who lead them and pursue their goals. The strategy has to do with the action or set of actions and resource allocation decisions that executives take for the company to pursue its vision and achieve a certain level of performance higher than that of its competitors. In this way, the strategy is developed as a management process, that is, strategic management (Hunger & Wheelen, 1995; Cescon et al., 2019).

Performance superior to that of its competitors can ensure that a company achieves a competitive advantage, but for that to happen, it needs to "establish an adequate strategy, based on three factors: coherent objectives, excellent understanding of the business in which it operates and evaluation internal capabilities" (Serra et al., 2012).

3.3 Competitive Advantage

The differentiating factors of an organization or company give rise to the concept of competitive advantage. A company has a competitive advantage when it can create value, that is, when it generates a surplus of outputs compared to production inputs. The differentiating factors that generate competitive advantage result from the differences that the company achieves in relation to its competitors. These differences can result from different sources of competitive advantage, such as: a similar product at a lower cost confers an advantage over costs; a different product valued by the customer gives an advantage for differentiation (Barney, 2014).

There are several definitions of competitive advantage, especially in the strategy literature. According to Porter (1986) what differentiates one company from another is the set of activities it performs and which ones it performs better than its competitors. For the author, competitive advantage is understood in a simplistic way, defining it as "the best performance of an organization's strategic activities in relation to its competitors". One way of measuring competitive advantage is through the concept of value creation, which compares the profitability obtained by the company with the opportunity cost of the investments made.

The competitive cost advantage is to produce at lower unit costs than competitors, either by selling at lower prices or by obtaining more favorable margins. Cost reduction can be achieved through individual or combined action, with the following effects: through economies of scale; the learning curve; improving production techniques; capacity utilization; and management efficiency.

The competitive advantage of differentiation is the ability of a company to supply a different object that is valued by customers and for which they are willing to pay more. Luxury goods tend to make use of this differentiation strategy. In the case of car brands, we are witnessing a constant search to differentiate themselves through technological innovations in efficiency, comfort, safety and new sources of fuel (Porter, 1999).

There are also companies that use hybrid strategies, which combine cost advantage and differentiation, such as the case of IKEA, which has a business model based on the concept of low cost and extremely functional design. However, having a competitive advantage is not enough. A company must have a sustainable competitive advantage that allows it to continually exploit its available resources, develop its core competencies and distinctive competencies that protect the company from threats from its competitors. Competence refers to the coordination of capacities, the company's ability to use its resources, and its integration. The distinction between core competencies and distinctive competences consists of the former being transversal competences to the organization and representing everything the company does well, and the latter, being designated distinctives when they surpass the competencies of the competitors. Distinctive competencies are a source of competitive advantage and to be sustainable, they must have the following attributes: have value for the client, be rare, which means that no competitor has these same competences; that are difficult to imitate; and must be exploited by the organization. These attributes are usually called resources, VRIO (valuable, rare, inimitable, organization), and when the response to these is positive for a given competence, we are facing a sustainable competitive advantage (Barney, 2014; Johnstone, 2019).

3.4. Management control

Management control is an area in constant evolution, its definitions vary according to the authors and the periods in proportion to the advancement of knowledge, techniques and practices. Management control responds to several strategic and organizational objectives. Depending on the company, it fulfills its missions, relying on various devices, instruments, and management systems, such as, for example, cost accounting or the budget system. Within the organization, the role of management control may occupy a position, namely the figure Controller (Vijayakumar, 2009; Gschwantner et al., 2016). To Jordan et al. (2015, p. 30) "Management Control is a set of instruments that motivate decentralized managers to achieve the company's strategic objectives, privileging action and decision making in a timely manner and favoring the delegation

of authority and accountability”.

Management control is located among other planning and control functions, such as strategy formulation and activity control, according to Anthony and Govindarajan (2008). The authors also indicate that “Management Control is the process by which managers influence other members of the organization to implement the organization's strategies” (Anthony & Govindarajan, 2008, p. 17).

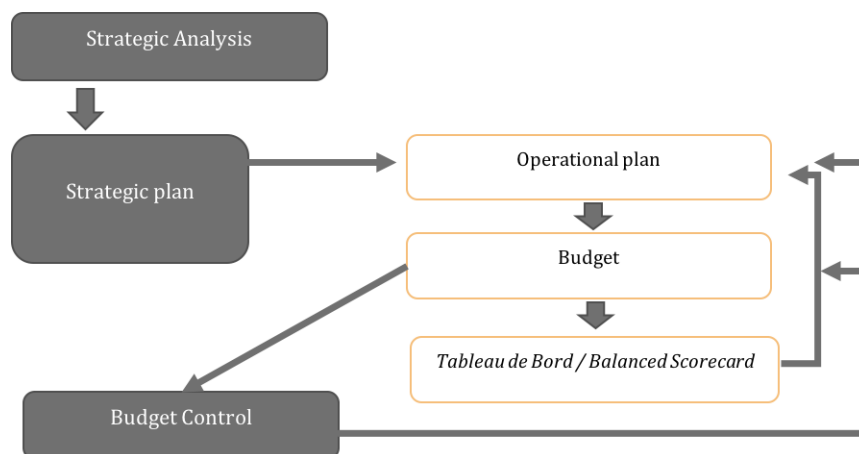
3.5. Management control tools

The emergence of a new economic situation led management to implement new strategies and, at the same time, new management tools. There are many solutions to conduct the strategy. The most important thing is not the tool itself, but the consistency of the management indicators in terms of the actions implemented. Monitoring tools are necessary for the effective running of the company and are systems that help to make decisions. Performance evaluation is an essential function within any organization. From a management point of view, it is important to understand how performance evaluation and control systems influence this evaluation (Pereira, 2013).

Control systems are essentially processing for evaluating and rewarding performance. It is about measuring both behaviors and their results, which correspond, respectively, to a control of behaviors and a control of results. Accounting information is the basis for control over results. This control mode is described as a “diagnostic check” and is defined as the formal information systems that managers use to monitor organizational results and correct deviations from predefined performance standards (Dias, 2014; Alabdullah, 2018; Alharbi et al., 2018).

In Figure 1, it is possible to observe the articulation of the management control tools with the instruments, which constitute the starting point of the management control process, strategic analysis and strategic plan.

Figure 1. Management Control Tools



Source: Adapted from Jordan et. al (2015, p. 277)

3.6. Tableau de Bord

According to Quesado et al. (2012) Tableau de Bord is a management tool that comprises a set of indicators, organized in a system, followed by the same team or the same person in charge to help decide, coordinate and control the actions of a service. It is a communication and decision-making instrument that allows the management

controller to draw the responsible person's attention to the key points of his management, in order to improve it (Selmer, 1998). For Silva (2013), Tableau de Bord has a multidimensional view and reporting an accounting and financial view. Reporting mainly consists of accounting and financial data that measure the company's assets and profits. The monetary nature of these data has the advantage of allowing their consolidation. However, since the end of 2001, there are many doubts about the relevance of the external view projected by accounting and financial data. In addition, the internal view of accounting data can isolate the decision maker in a management process that does not take into account corporate realities, such as market developments, stakeholder expectations (shareholders, human resources, customers), future needs of qualification (component of intangible assets) (Bourokba, 2015).

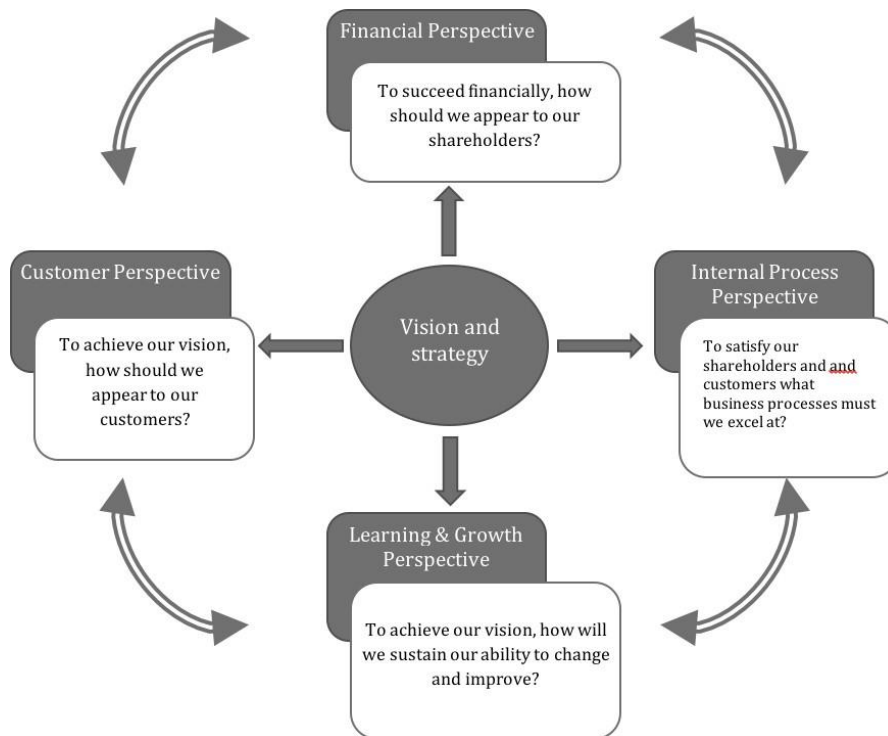
3.7. Balanced Scorecard

For a long time, control of an organization's performance management has been assimilated with cost management. Thus, the first monitoring systems focused on indicators to control production and the evolution of costs. Little by little, it seemed to decision makers that the value of a product does not depend exclusively on its price, but on other criteria, such as the quality of the product or the speed of its delivery. As a result, companies have moved away from performance management systems related exclusively to the financial structure.

The BSC is, therefore, a tool for controlling and monitoring performance. It is presented as a set of indicators, directly related to the strategy developed by the company, offering the user the opportunity to control all determinants of performance (see Figure 2). The latter represent the main success factors and are divided by variables of actions and results, of a financial and non-financial nature, quantitative and non-quantitative, with a short- and long-term orientation (Ribeiro, 2008).

These indicators are generally accessible to all employees. The BSC becomes a way for employees to take ownership of your company's strategy. Managing a company using only financial indicators is no longer a current reality. Kaplan and Norton offer a multidimensional view of performance, more precisely, the authors define four privileged axes of performance analysis. The objective is, through these four perspectives, to identify the creation of past added value, but also to evaluate the determinants of future performance (Quesado et al., 2012).

Figure 2. Management Control Tools

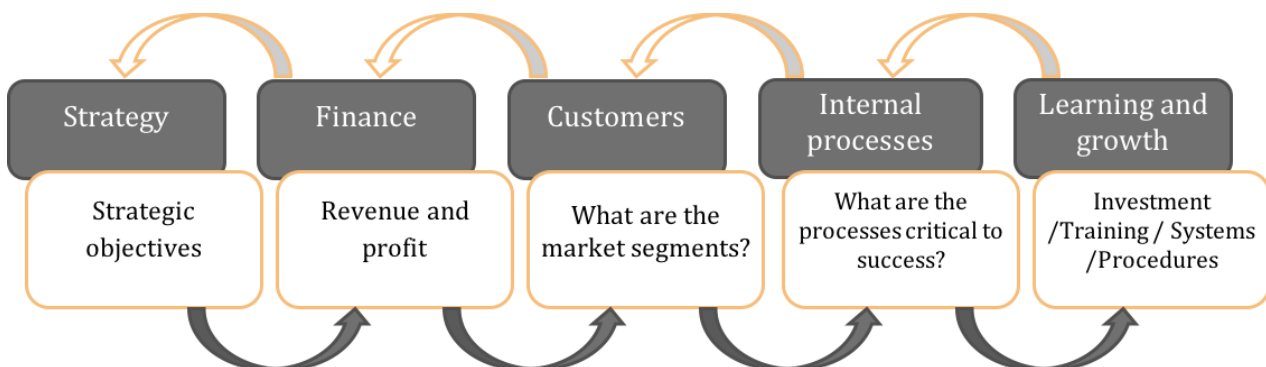


Source: Adapted from Kaplan & Norton (1996, p. 79)

Regarding the financial perspective, the financial axis represents the long-term objectives company's term. This axis includes the main classic financial indicators; The novelty lies in the desire to link these financial indicators to the client's reality (new customers, target customers, potential customers) and the process of creating products and services (research and development, new products, and services) (Malgwi & Dahiru, 2014).

Regarding the perspective of learning and growth, Kaplan and Norton position this axis as the one that contains the means and factors to improve the criteria of the other three axes. They determined in their book “The Balanced Scorecard: Translating Strategy into Action” a hypothesis about the chain of causes and effects that lead to success strategic (see Figure 3). The fundamental basis for strategic success must be carried out with the organization's staff. The people involved should be encouraged and properly supervised and the learning process must be continuous and permanent (Ahmed et al., 2007).

Figure 3. Cause-effect relationships in the BSC



Source: Adapted from Kaplan & Norton (1996a, p. 150)

According to Laske (2001), healthy organization as an entity learning culture encourages both aspects of knowledge: formal and informal, and by establishing abundant internal communication. In an organization that learns and grows, where culture encourages people to make suggestions and challenge conjuncture, this results in a significant flow of new ideas generated by employees. These ideas are essential for the future development of the organization, because they come from specialists who are directly and daily involved in business processes from the company. The main functions of the BSC as an instrument for implementing the strategy are as follows: communicate strategy, align actions with strategic goals and measure performance (Farooq & Hussain, 2011; Dmitrovic-Saponja & Suljovic, 2017).

3.8. Tableau de Bord vs Balanced Scorecard

The main distinguishing feature between Tableau de Bord (TB) and Balanced Scorecard lies in the its use and for what purpose it is developed, that is, if it will have as purpose monitor and control operational or strategic aspects. However, it is common to associate TB to operational control panels, prepared by a responsibility center in according to your objectives. In turn, the BSC is perceived more as a tool for strategic management and link between operational perspectives (Russo, 2015; Pavlatos & Kostakis, 2018; Siska, 2018).

Table 1. TB vs BSC. Illustrates the main differences between both operational and strategic control tools.

Tableau de bord	Balanced Scorecard
Aims at operational control	Aims to control the strategy
French in origin, designed by engineers, to monitor productive operations	Developed at Harvard as a strategy study and dissemination tool
The objectives are defined according to the manager, there are no guidelines for their design	The objectives are framed in 4 perspectives, with a lower degree of freedom
Key variable concept (conditions results)	Critical factor concept (conditions objectives)
Information rich indicators	Dichotomous, result (lead) and process (lag indicators) indicators
Adaptive and customizable	Adaptive

Source: Adapted from Jordan et al (2015, p. 287)

3.9. Business Intelligence

The Business Intelligence (BI) is a decision support tool. BI allows to control the company's activity, producing a complete set of indicators and tools: reports, Tableau de Bord and forecast analysis. It is information technology for use by business managers. It refers to the means, tools and methods that allow to collect, consolidate, model and restore the data, tangible or intangible, of a company, in order to support the decision and allow a decision maker to have an overview of the treated activity.

According Kumari (2013), the Business Intelligence, is the set of tools and methods that aim to transmit relevant information to business managers. Its goal is to help them understand their environment and support them in their strategic decision making. User

needs are therefore at the heart of effective Business Intelligence. BI is the set of technologies that allow companies to analyze data for the benefit of their decision making.

The report is probably the most used BI application and allows managers to do the following: select data for a specific period, production or sector of the client; classify, group or distribute this data according to the criteria of your choice; perform various calculations (totals, averages, variances, comparisons from one period to another); and present the results in a synthetic or detailed way, most of the time graphical according to your needs or the expectations of the company's managers (Elena, 2011).

The term Business Intelligence also refers to applications, infrastructures, tools and practices that provide access to information and analyze figures to improve and optimize a company's decisions and performance. In other words, BI is the technology-driven data analysis process to discover information that can be used to help business leaders and other end users make more informed decisions (Chaudhuri, Dayal, & Narasayya, 2011). Thus, BI brings together a wide variety of tools, applications and methodologies to collect data from internal systems and external sources, preparing them for analysis, developing them and launching queries at the same time, within these data sets (Hippenmeyer et al., 2004).

In the past, data was stored on physical media, requiring a lot of preparation and calculation time to produce relevant information for management decision making, BI introduces the concept of a global view of the activity for one and the same place, the Data warehouse³ (Nedelcu, 2013).

4. Research Methodology

The development of this project work was based mainly on research, at the level of literature reviews and on the company's case study. The main objective of the literature review was to expose and clarify concepts related to management control, tools, such as Tableau de Bord and the Balanced Scorecard, and their benefits for strategic planning.

The research method was based on the collection of information in 2018, that is, a literature review and data collection to answer the objectives of the present study. As a support to the literature review scientific journal articles, conference articles, web pages, books and dissertations were used in the area of management control in order to illustrate the state of the art (Barañano, 2008).

Given that this is an investigation with the objective of studying a social phenomenon, a qualitative approach was chosen, on the form of the case study methodology, which is often used in investigations in the area of organizational studies, as it seeks to understand and explain the practices observed. It is also characterized by its interpretative or critical nature as it works on qualitative methods. It also serves to illustrate certain topics within an evaluation, through a descriptive approach, to explore situations in which the intervention, being evaluated, does not present a clear and unique set of results (Yin, 2014).

The case study phase applied to the company, aimed to analyze, characterize and propose a new approach to the current management control landscape. The analysis

³ Data warehouse used to store information related to a company's activities in databases, on a consolidated basis.

methodologies included the application of surveys, the observation of internal procedures and documentary analysis (Yin, 2014). After this phase, proposals were made to improve the current management control system.

4.1. Specific objectives

In view of the business reality of the company under study, it was pertinent, before the preparation of proposals, to know the degree of understanding and use by employees of management control tools.

According to Fortin (2006, p. 32) “in qualitative research, a set of philosophical notions derives from the fundamental scheme and provides the perspective that the researcher will adopt in his study. This perspective manifests itself in the type of questions that are asked, in the observations that are made and in the interpretation of the data”.

Thus, applying the survey method to the organization, resorting to the development of a survey, it was intended to assess the profile of the respondent, the difficulties of the organization in using this type of tool, the obstacles to its implementation and use, as well as the impact in productivity and efficiency.

The main objective of this work is to characterize the management control tools that best suit the needs illustrated in the surveys. To answer the main objective, five questions were asked:

- Q1: Are the organization's mission, vision and values effectively communicated?
- Q2: Do respondents know about management control practices?
- Q3: What are the management control tools you know?
- Q4: What are the competitive factors that you consider essential for increasing productivity and competitiveness?
- Q5: What are the main obstacles to the implementation of these management control practices?

4.2. Research Method and Techniques used

The choice of the survey method using a survey is related to a structured technique for data collection, and aims to collect factual information about events or known situations about attitudes, beliefs, knowledge and opinions, making it possible to translate the necessary information into a series of specific questions (Norwood, 2000). The survey was created based on existing and tested surveys, in order to respond to the organization's needs and compare results. However, it was decided to adapt some questions given the objective of collecting real information. The construction of the survey followed the steps, illustrated below, suggested by Fortin (2006, pp. 380-381):

- Determine what information to collect;
- Constitute a question bank;
- Formulate questions;
- Sort the questions;
- Submit the draft survey for review;
- Pre-test the survey;
- Write the introduction and guidelines.

To guarantee the applicability of the survey in solving research problems, a pre-test was applied to a restricted group of people. This pre-test resulted in confirmation of the adequacy of the survey.

To disseminate the survey, the Google Forms platform was used in order to administer and send by email.

4.3. Survey structure

The questionnaire developed was based on other studies, namely:

- “Management control practices in the largest companies in the central region”, Institute of Accounting and Administration of Coimbra, Polytechnic Institute of Coimbra (Abreu, 2013);
- “Management Control - A tool for monitoring operational objectives”, School of Technology and Management, Polytechnic Institute of Portalegre. (Bica, 2012);
- “Analysis of the implementation of the Balanced Scorecard tool in a hospital”, University Institute of Lisbon (Dias, 2014).

In the elaboration of the structure of the questionnaire, we chose to use closed questions of multiple choice, dichotomous, three open questions and Likert scale. The Likert scale consists of an additive scale, in which the participants indicate their degree of agreement to an issue, typically grouped into 5 categories from lowest to highest (Fortin, 2006). The choice of using closed-ended questions is based on the ambiguity that may result in the interpretation of responses, in this sense, it was decided to provide a clearer and more elaborate statistical analysis. In turn, open questions result from the need to obtain which key elements of company’s mission and vision are present in the answers.

It started with sociodemographic questions, followed by generic questions related to the organization, and finally, specific questions resulting from knowledge of the subject under study. The survey consists of the following structure:

- Group I, with questions about the person who responded to the survey;
- Group II, with questions related to the company's mission, vision and values;
- Group III, with specific questions referring to management control tools.

The first group contains four questions, on gender, age, characterization of the department in which it collaborates and the level of qualification of the respondent, which allows to determine whether communication is more effective in certain departments or whether the level of qualifications of the respondent will impact on perception of the organization's objectives (Barañano, 2008).

4.2. Data Collection

The surveys were sent to the Company's employees via e-mail, in the form of a hyperlink to the Google Forms form, which allows them to be completed online, accompanied with an introduction and presentation text of the project, in order to elucidate the participants regarding the objectives of the project.

The collection of responses took place in May 2018, with a total of 9 complete responses from 18 answered surveys, from a universe of 35 employees.

For statistical analysis and data treatment, descriptive statistics techniques, measures of central tendency, such as mean and mode, and dispersion measures such as standard deviation and exploratory data analysis were used. As inferential statistics techniques, parametric tests were used to verify the degree of correlation of two variables, using

Pearson's R coefficient and analysis of variances, and as non-parametric test, ordinal variables, the Chi-test was used. Square. For this purpose, the program SPSS version 23 (Statistical Package for the Social Sciences), Microsoft Excel and Google Forms were used.

5. Main Results

With the application of the survey and data collection, it is possible to affirm that the Company has a high level of technicality, since 61.1% of respondents have a higher education degree, have a relatively young team, with an average age of 35 years old, and mostly male (61.1%). Regarding the results to the questions of specific objectives, it is possible to state that:

Q1: The organization's mission, vision and values are not effectively communicated (of the 18 respondents 33.3% know the vision and the rest (66.7%) do not know or perceive it in the wrong way);

Q2: Respondents who know the practice of management control (of the 18 respondents 10 (55.6%) said they know the BSC, of which 8 (80%) also claim to know other management control practices);

Q3: The management control tools they know are performance monitoring through indicators (KPI - 24%), budget control (17%), Tableau de Bord, and EVA (14%);

Q4: The competitive factors that they consider essential for increasing productivity and competitiveness are meeting deadlines for delivery of products/services, increasing customer satisfaction, improving financial performance and liquidity, increasing commitment, involvement employees and greater cost control;

Q5: The main obstacles to the implementation of these management control practices pointed out are the action and power of influential managers and resistance to change.

The results obtained, detailed in the previous sub-chapter, serve as a basis for the main objectives inherent to the implementation of the BSC.

6. Implementation proposal

To start the design, the development and implementation of a management control system, it is necessary to resort to a diagnosis of the company's needs within the scope of these tools.

As a result of the documentary analysis and the application of the survey, it was possible to obtain a set of information that is relevant to the company's functioning and crucial to the reasoning of the proposal. The main aspects retained are: a set of gaps in terms of internal communication, namely in the articulation between the different departments; to measure performance, there is no formally established tool, however, as a pilot tool the company uses the ERP (Enterprise Resource Planning) and Microsoft Excel system; the presentation of performance results is essentially composed of financial reports and business reports, with a focus on financial data.

Following this analysis, it is concluded that in terms of internal communication the company has little information, difficulties in connecting and disseminating the work carried out by departments. Nevertheless, the company measures performance

essentially by financial indicators, neglecting non-financial indicators. In view of the above, it is understood that the management control tool that best meets the needs of the company under study is the BSC, as a piloting tool, interconnected with ERP and a BI platform, namely Microsoft PowerBI. The BSC will bring improvements in communication, adding cause and effect relationships in the interconnection between departments and leading to the achievement of the strategy. In turn, Microsoft PowerBI will increase speed and quality in communication, since it is an online platform. The BSC will enable the entire company to be involved, as individual contributions by objective and the influence on their perspectives will be perceived. Based on the four stages of creation of the BSC defended by the authors Kaplan and Norton (1996) the following creation proposal is as follows:

1. Definition of strategic planning;
2. Develop the objectives and indicators;
3. Draw up the strategic map;
4. Establish goals and initiatives.

The proposed instrument aims to assess performance at all levels of the Company and play a key role in decision making, as it is a tool that tracks results. The BSC will follow the classic construction, that is, it will aggregate the 4 perspectives developed by Kaplan and Norton: the financial perspective, the customers perspective, the internal process perspective and the learning and growth perspective. For each of them, objectives, indicators, goals and initiatives were defined. Using the BSC, it is intended to create a link between the strategy and the initiatives, that is, operationalize objectives, develop indicators and actions for each of them. Given that the Company's mission is to lead its area of activity, produce and develop high quality solutions, guarantee excellent services and satisfy the needs of customers, the following table was produced (Table 2).

Table 2. Objectives, indicators and goals

Objectives & KPI & Goals				
Perspective	Objective		Key Performance Indicator (KPI)	Goal
	Nº	Name		
Finance	F1	Ensuring financial sustainability	Annual Revenue EVA (Economic Value Added)	> 15M€ > 30% (N-1)
	F2	Be competitive in operating costs	EBITDA	< 1% (N-1)
Customers	C1	Increase customer satisfaction	Level of customer Satisfaction % Complaints	> 98 % < 2%
	C2	Conquer new customers and markets	Market share	> 30%
	C3	Ensure on-time deliveries	% on-schedule delivery	> 95 %
Process	P1	Increase assertiveness in the budgeting process	% budgetary deviations	< 2%
	P2	Increase productivity	Index of man-hours Index of machine-hours	< = 120 hr/man < = 40 hr/mac
	P3	Maximise existing resources	Production index % manufacturing defects	> 10% (N-1) < 5%
Learning and Growth	A1	Investment in employee training	Training hours	> = 35 hr
	A2	Empowering employees	Employee satisfaction rates	> 95 %
			Performance evaluation	> 90 %
A3	Investment in innovation	% innovation projects	> 30%	

Source: Prepared by Authors

In the financial perspective, two objectives were selected that serve as a focus for the operational objectives and for the other indicators in the table. Regardless of the measures adopted, they must be part of a chain of cause-and-effect relationships, that is, they must be aligned with the company's strategy and define the expected financial performance. Thus, two objectives were defined: ensuring financial sustainability (F1) and being competitive in operating costs (F2). To achieve these objectives, the respective indicators and targets were also defined: the volume of billing; the Economic Value-Added indicator (EVA), since it is the metric for calculating value for the capital holder; and EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) the same as the income statement item before interest, taxes, depreciation, and amortization.

The objectives from the customers' perspective were outlined considering the criterion of creating value for the customer, in which it shows the performance indicators linked to the market and the segments in which the company competes. These are also the indicators that are directly related to the financial perspective, maintaining the cause-effect relationship. For this perspective, the objectives set were as follows: to increase customer satisfaction (C1); conquer new customers and markets (C2); and ensure on-time deliveries (C3). For each of them, the indicators set were: the level of customer satisfaction, which will be possible through customer surveys; the percentage of complaints; the market share (Market share), which consists of the part held by the company in a given market, will make it possible to perceive an order of representation of the company; and finally, the indicator that will serve to measure objective C3, the percentage of deliveries on time, which will allow to demonstrate whether the internal processes are working efficiently, reflected in the quality of service provided by the company.

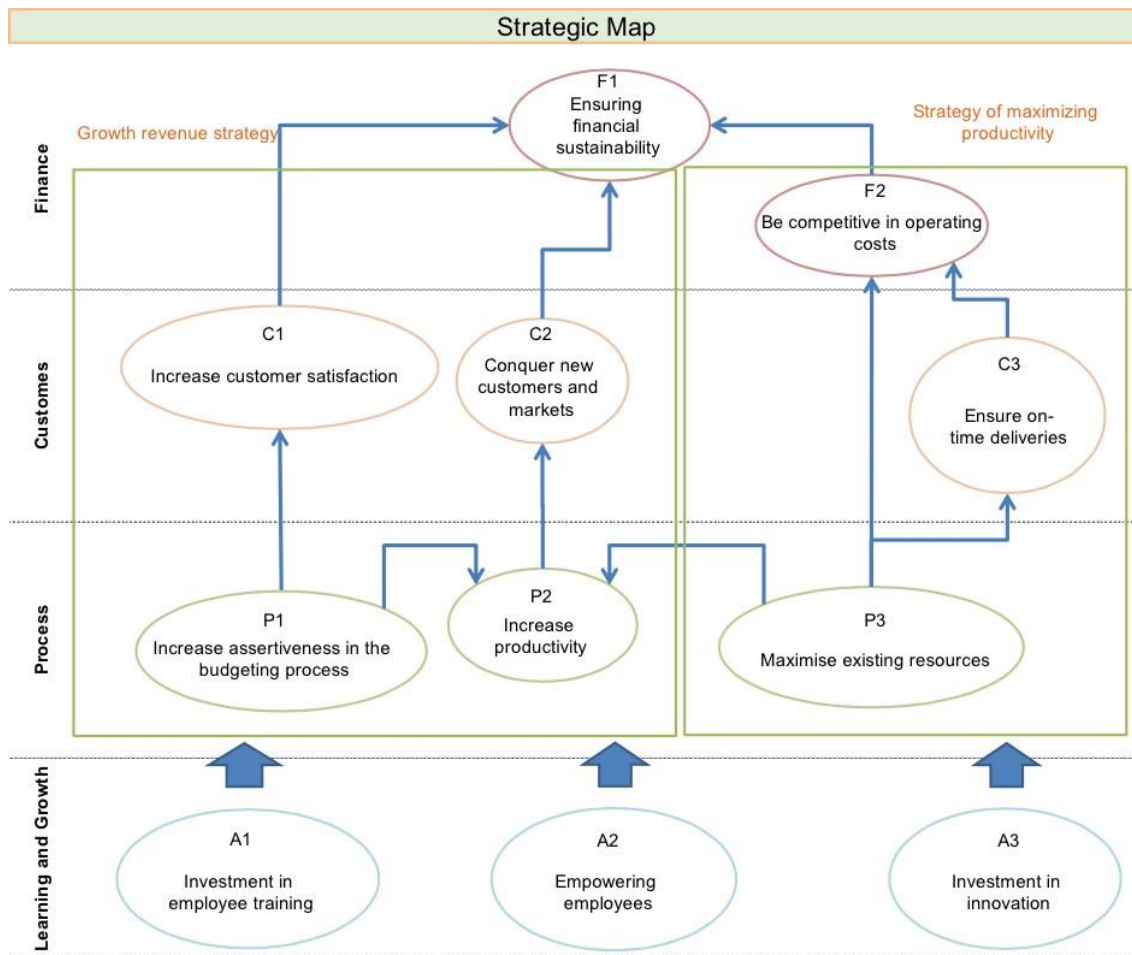
In turn, from the perspective of internal processes, the focus is on the processes and which ones allow the creation of value for customers, that is, providing the value propositions that attract and retain customers. According to the authors Kaplan & Norton (2008) 3 main processes were identified, which are part of the Porter value chain (1986), that support this perspective, namely: innovation; operations; and after-sales services. To support the financial perspective and the customers' perspective and measure the performance of this perspective, the following objectives were defined: to increase assertiveness in the budgeting process (P1); increase productivity (P2); and monetize existing resources (P3). For objective P1, the percentage of budget deviation was chosen as indicator, for objective P2, two objectives were selected, the man-hour index and the machine-hour index, respectively; finally for objective P3, the production index and the percentage of non-conformities were defined, that is, non-conforming product.

In the last perspective, the capacities that the company must develop in order to improve internal processes are identified, then generate value for the client and, finally, generate value for the partners. The motivation and satisfaction of employees is essential for achieving the objectives reflected in the BSC, as well as investing in information systems and innovation, research and development. In this sense, the following objectives were defined from the perspective of learning and growth: investment in employee training (A1); employee capacity (A2); and the bet on innovation (A3). To

ensure the results, which depend fundamentally on the competence and satisfaction of employees, technological infrastructures and an aligned organizational culture, the proposed indicators are the following: average hours of training per employee; degree of employee satisfaction; technicality index (percentage of employees with technical training); performance evaluation, number of accepted innovation projects, obtained through the company's existing knowledge management platform.

The authors of the tool define “the strategic map as a visual presentation of the strategy, showing on a single page how the objectives in the four perspectives are integrated and combined to write the strategy. Each company adapts the strategic map to its specific set of strategic objectives” (Kaplan & Norton, 2000). In order that the objectives previously described are more easily perceived, and the cause-effect relationships between the objectives and the perceived performance inducers, the proposed strategic map is shown in Figure 4.

Figure 4. Strategic map



Source: Prepared by Authors

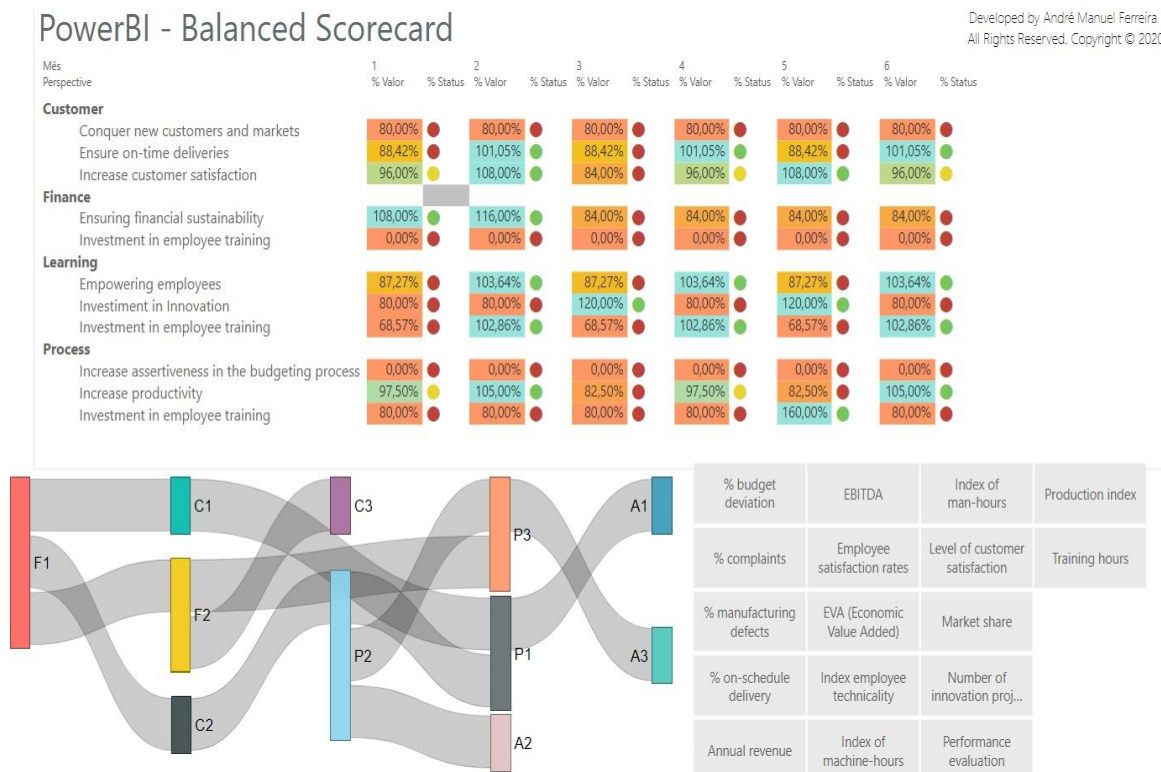
Alongside the strategic map, a set of initiatives was proposed:

- Financial perspective: decrease in fixed costs; increase the average payment term;
- Customer perspective: introducing a customer loyalty program; bet on Digital Marketing; identify new business opportunities; customer surveys;

- Perspective of internal processes: production control tools; project management through departmental Scores; new facilities;
- Learning and growth perspective: employee surveys; knowledge repository; technical training for the different specificities.

Then, a dashboard was built on the Microsoft PowerBI platform. Dashboards are dynamic information panels used to obtain relevant information for management control. Visually appealing bring together performance indicators (Key Performance Indicators - KPI), graphs and tables in a single page, in order to identify relationships between them (Caldeira J., 2014). In view of the literature review, the proposed final model was developed in order to simplify the visualization of the indicators by perspectives and objectives, as well as the cause and effect relationships, see the figure (Figure 5) below.

Figure 5. BSC Dashboard



Source: Prepared by Authors

For the construction of the dashboard, the requirements proposed by Eckerson were respected (2006) in order to provide relevant information to users, measure, monitor, and manage progress in achieving strategic objectives. One of the requirements is to frame all the information on a single screen and guarantee its perception. Then, contextualize the data, avoid the excessive use of details, choose the most appropriate graphic component, it must be related to the nature of the information and the message that is intended to be transmitted, to arrange and highlight the data properly according to its degree of importance. , and finally, use appropriate colors.

The communication of the strategy and its proper implementation are fundamental to its success. One of the primary aspects of the BSC is to have performance measures that link the results of the actions to the achievement of the defined strategic objectives. It is through this tool that the management framework can assess the applicability of the strategy.

Successful implementation depends on understanding the objectives and establishing a commitment to maintaining and reviewing the indicators and targets. According to Ittner & Larcker (2003) there are 4 common mistakes in the implementation and use of the BSC that lead to failure, which are:

1. Not establishing the correct link between the indicators and the strategy;
2. Not validating the cause-effect relationships;
3. Not setting adequate and realistic goals;
4. Measure incorrectly.

7. Conclusions

The main objective of this project was to identify the characteristics of the management control tools and which ones best suited the company under study, and thus formulate a proposal for implementing one or more tools. Considering the advantages and disadvantages of each of the tools, the Balanced Scorecard methodology was chosen, because although it is not infallible, when applied correctly and supervised, it simplifies the strategy consolidating the necessary information for decision making.

To carry out this work, it was necessary to review several management controls instruments and the basic concepts of the studied theme. It was also possible to conclude that organizations differ in terms of the needs of these same instruments, sometimes with hybrid systems that integrate different indicators and goals, without culminating in one direction: strategy. In this sense, the choice of the BSC methodology was both necessary and appropriate for the company, since it aggregates the different perspectives and directs the capacities and competencies for the strategy, not forgetting the objectives associated with quality, innovation, motivation, leadership, that is, non-financial objectives.

After clarifying the tool to be applied, it was intended to integrate the methodology with the new BI platforms, choosing Microsoft PowerBI for its simplicity of use and an environment like Excel. This platform allows it to be transversal to all the organization's equipment, making it possible to assign Scores by department through the employees' mobile equipment, terminals and computers.

The revenue and productivity growth strategy are ensured by the proximity to the customer, which distinguishes the company under study from its competitors and gives it a competitive advantage. In this way, the application of the BSC can measure the aspects that lead to competitive advantage, namely the bet on innovation and the training of its employees through motivation, training, leadership, which in other tools it would not be possible to compile and measure. It is possible to add that the BSC, in valuing the organization's intangible assets, that is, giving the same emphasis to the

financial information that it grants to non-financial information, generates competitive advantages for the organization.

The consolidation of the company's strategy was essential for the establishment of the Company's strategic objectives, which consisted of analyzes of the internal and external environment, as well as a review of the organization's mission, vision and values. With the application of the questionnaire, it was found that in terms of internal communication, the company retained little information, the company's mission was known only to 38.9% of employees, had difficulties in connecting and disseminating the work carried out by departments. With the integration in Microsoft PowerBI, the speed and quality of communication will be increased, given the characteristics of mobility (online) and information convergence in a single database. The BSC will also make it possible for the entire company to be involved, insofar as individual contributions by objective and the influence on the respective perspectives will be perceived.

This project ended with a proposal for the implementation of the BSC and a BI platform with direct applicability in the company and proved to be a valid contribution any organization that intends to implement the methodology, integrate with other existing systems.

Some limitations were observed during this study. Participation in the questionnaires was not enough to further develop the research project. There was a high number of absence of answers, as well as it was registered in the analysis of results that a large part of those who answered had the predominant answer "I neither agree nor disagree". Given the complexity and average implementation time, approximately 16 weeks (Kaplan & Norton, 1996) it is not possible to evidence the results of applying the methodology, which limits evidence of direct correlation between the management control tool and competitive advantage.

The results of this study allow us to conclude that further investigation may be needed. Indeed, although the proposal has a direct applicability component, it is lacking to implement it and monitor the indicators and results. The methodology is found, according to Pinto and Barbedo (2016), in a phase of adaptation to the "digital revolution", so it would be interesting to check the model in-depth in Microsoft PowerBI environment or applied in other BI platforms.

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Appendix

Survey "Management Control Tools as a source of Competitive Advantage"

The present questionnaire by inquiry will be applied in order to assist in the master's project, entitled "Management Control Tools as a source of competitive advantage" within the scope of the Master in Business Management of the Higher Institute of Accounting and Administration of Coimbra. Your collaboration is essential for the successful application of the same, for which I thank you in advance.

All data will be treated for academic use only. Their anonymity and confidentiality will be strictly guaranteed.

This survey will take a maximum of 5 minutes to be answered.

*Mandatory

Group I

Characterization of the Employee

1. Please indicate your gender:*

Mark only one oval.

- Female
- Male

2. How old are you?*

3. Indicate in wich department you work:*

Mark only one oval.

- Commercial
- Project
- Production
- Logistics
- Administrative
- IT
- Quality
- Financial

4. Tick your qualifications:*

Mark only one oval.

- 1st cycle of basic education

- 2nd cycle of basic education
- 3rd cycle of basic education
- Secondary / vocational education
- Higher Technician Course
- Graduation
- Postgraduate studies/Master's
- PhD

Group II

Solintellysys

5. Are you aware of Solintellysys Mission?*

Mark only one oval.

- I have no knowledge.
- Yes, I know.

6. If you answered “Yes, I know” in the previous question, please indicate what the company’s mission is, otherwise proceed to the next question.

7. Solintellysys has Values that support the vision, identify 7 values from those illustrated below.*

Check whatever is applicable.

- Sustainability
- Environment
- Excellence Trust
- Quality
- Innovation
- Ambition
- Competitiveness
- Creativity
- Costumer orientation
- Efficiency

- Enthusiasm
- Respect
- Responsibility
- Development

8. Regarding the Vision, are you aware of it?*

Mark only one oval.

- Yes
- No

9. If you answered “Yes” in the previous question, please indicate the company’s Vision, otherside, proceed to the next question.

10. What is you level of knowledge of the objectives defined for you Department?*

1. Very Low; 2. Low; 3. Sufficient; 4. High; 5. Very High

Mark only one oval.

	1	2	3	4	5	
Very low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Much high

11. What is your degree of agreement with following statement: The company’s Vision is effectively communicated.*

1. I totally disagree; 2. Disagree; 3. I neither agree nor disagree; 4. I agree; 5. Strong agree

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I agree totally

12. What is your degree of agreement with following statement: The company’s mission is effectively communicated.*

2. I totally disagree; 2. Disagree; 3. I neither agree nor disagree; 4. I agree; 5. Strong agree

Mark only one oval.

1	2	3	4	5
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Strongly disagree I agree totally

13. Please indicate from 1 to 5 the degree of agreement with the following statements:*

Mark only one oval.

	1.Strong Disagree	two. I Disagree	3. Do not agree or disagree	4. I Agree	5. I totally Agree
It is important to use tools to monitor and control the evolution of the organizational strategy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mission is the reason to be from a company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The current Vision and Mission communication process is transparent and effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Solintellysys Goals are perceive and communicated effectively.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The evaluation of results is an important step in reaching the objectives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Management should focus essentially	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

short-term problems.

14. Have you heard of the Balance Scorecard?

Mark only one oval.

Yes.

No.

After the last question in this section, proceed to “End!”

15. What about other performance control and monitoring practices?

Mark only one oval.

Yes.

Go to question 16.

No.

Go to “End!”

Group III

Management Control Tools

16. From the performance monitoring and control tools listed below, identify those you know.

Check whatever is applicable.

- Tableaux de Bord
- Economic Value Added
- EVA (Business Intelligence)
- Monitoring of Indicators (KPIs) and Budget Control
- Objectives
- ABC Costing Method (Activity Based Costing)
- Process management or BPM (Business Process Management)
- Other: _____

17. Please indicate from 1 to 5, the degree of importance of the factors illustrated below, which can better respond to the current needs of Solintellysys and contribute to the increase of competitive advantage.*

Mark only one oval per line.

1. Nothing 2. Little 3. Relatively 4. Important 5. Very

	Important	importante	important	important	important
Great cost control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Optimization of production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduction of production losses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased productivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Growth of turnover	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Higher marketshare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Higher quality of processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reaching organizational objectives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strategic alignment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compliance with product/service delivery deadlines (Technical Assistance)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Development of new products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improvement of financial performance and liquidity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased					

customer satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased commitment and involvement of employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stimulation of internal communication and information sharing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. What factors do you consider as barriers to changing management control policies at Solintellysys? Rate your level of agreement from 1 to 5.

Mark only one oval per line.

	1. Strongly Disagree	two. I disagree	3. Do not agree or disagree	4. I Agree	5. I totally Agree
Costs high levels of new software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incompatibilities with other management information practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Top management coservatism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resistance to change existing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Management control practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resistance to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The action and power of influential managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Concern about the fall in team morale

Management control is not considered important, compared to other systems

19. Please indicate from 1 to 5 of agreement with the following statements:*

Mark only one oval per line.

1. Strongly Disagree two. I disagree 3. Do not agree or disagree 4. I Agree 5. I totally Agree

Budgetary control does not require involvement of all Solintellysys employees

Indicators and Objectives must be correctly defined to measure the Departments performance

The absence of organization chart leads to a dilution of responsibilities

The implementation of one or more control tools enables quick and timely decision-making

Awareness raising
And everyone's
commitment
ensures
compliance with
Solintellysys
strategic objectives

Department
directors must
promote
employee
involvement in
achieving the
objectives

The Balanced Scorecard consists of 4 perspectives, of the objectives illustrated below, indicate which ones you consider most relevant and appropriate to Solintellysys, based on its Vision and Strategy:

20. In the Financial Perspective:*

Mark only one oval per line.

- Ensure financial sustainability
- Be competitive in operating costs
- Increase customer portfolio
- Maximize value
- Improve the cost structure

21. From the Customers' Perspective:*

Mark only one oval per line.

- Improve service quality
- Loyalty new customers
- Increase customer satisfaction
- Reduce service waiting time
- Ensure on-time delivery

22. From the perspective of internal processes:*

Mark only one oval per line.

- Increase productivity
- Increase assertiveness in the budgeting process
- Develop the internationalization process
- Reduce downtime
- Monetize existing lower resources
- Indirect costs

23. From the Learning and Growth Perspective:*

Mark only one oval per line.

- Capacity of employees
- Investment in employee training
- Level of employee productivity
- Investment in IT tools (Information Technologies)
- Bet on Innovation

24. Is there a question, not present in this questionnaire, that you would like to answer?

Go to "End !."

End!

You finished your questionnaire!

Thank you for your cooperation and time spent.

With technology

