Dashboard to monitor performance of an hotel in the financial perspective

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***Abstract* — Companies in a very competitive environment need to analyze the data generated by the business quickly, intuitively and easily read. Thus, dashboards, a form of reporting that allows the monitoring of indicators relevant to the business, it has become popular among managers. In this context, this article focuses on monitoring the performance of the Hotel Resort& SPA, from the perspective of its financial officer. To this end, two models of dashboards for hotel finance managers are proposed based on good practices identified in the literature. Interviews with experts allowed the identification of key performance indicators and ensured that dashboards are effectively useful for decision-making. Thus, this study contributes to helping financial managers, related to hospitality, in decision making by providing two types of dashboards. In addition, it contributes to the knowledge by identifying relevant KPIs, from the perspective of the financial management of hotels, and making known the dashboards, specifically elaborated in the perspective of the use by these professionals.**

Keywords – Performance; Dashboard; Report; Excel; Hotel.

I. INTRODUCTION

It is imperative for any manager to have all the information in a fast, intuitive and smooth reading. Only that way it is possible to make a correct decision, reducing decision time and the risks of a business.

On the other hand, performance monitoring allows a more effective and efficient management. However, a correct monitoring is only possible recurring to adequate tools, dashboards are rather popular tools [1]. These are panels, organized in a single screen, where they are visualized as the information is necessary, intuitively, in order to allow the visualization of the pre-established goals [2].

Among the indicators to be visualized the most notorious to monitor the performance are KPI (Key Performance Indicators), which are established for the manager and used to measure the performance of organizations [3]. They are systematically tracked in order to meet their goals, being it analysis fundamental to a decision-making process.

Dashboards have been distributed in various business areas [2][4] and at several hierarchical levels of the organization [5]. In addition, hospitality has a dedicated use for different purposes, from the most operational level, from the main processes that are addressed to employees [2][6], to the top of management [7]. However, we did not identify any study regarding a specific dashboard for the hotel financial department.

In this context, this article has as main purpose the presentation of a suitable computer tool to monitor the performance of a hotel from the perspective of its manager / chief financial officer. In particular, it aims to: i) identify monitoring practices; ii) identify relevant KPIs for financial managers / directors; and (iii) provide dashboards to monitor the set of relevant KPIs.

Achieving this purpose will allow hotels and, in particular, their financial managers, to realize if they are meeting or not their pre-established goals. Additionally, it is possible to present a brief presentation with major relevance to whom it might concern [5]. In another aspect, this article contributes to the presentation of a dashboard to monitor the performance of the hotel from the perspective of financial managers of these types of organization.

II. LITERATURE REVISION

With focus on the purpose, it is relevant to frame research in the literature. Thus, some relevant concepts are presented, highlighting the concepts of performance evaluation, performance indicators and performance monitoring. Additionally, a brief contextualization of KPIs and dashboards is presented, referring to their application in the hotel industry.

A. Concepts associated with dashboards

Increasingly organizations are aware of the existence of computer tools that can assist them in monitoring and evaluating performance in accordance with established objectives [8]. Thus, they need regular assessment in all activities so that they can identify potential improvements and avoid risks. In fact, there is a lot of competition between organizations, which causes a constant pressure to identify and manage problems as well as to improve their performance [9].

Evaluating performance serves, on the one hand, to integrate employees and evaluate if they fit the position they carry out, in order to identify their competencies, and, on the other hand, to take decisions and adopt measures regarding the improvement of the performance of the organization [10]. In this perspective, the performance evaluation seeks to know and measure the performance of employees, establishing a comparison between expected and observed performance and aiming to align the goals with the organization's strategy [11].

In this way, performance evaluation should be well planned from the outset between managers and employees, as the performance evaluation objectives should be clearly known and accepted by both parties (evaluator and evaluated) [11]. Thus, the performance evaluation generates a greater attention on the part of the managers, aiming to provide greater coherence and effectiveness in the decision-making, besides that it stimulate the attention of managers and collaborators, contributing to a better communication. It is also important to emphasize the importance of decentralization, that means, to give management power to the various hierarchical levels within the organization, which allows that not all decisions have to be taken by the higher hierarchical levels, allowing faster decision-making [12].

A performance evaluation requires the selection of performance indicators. These should be considered as an integral part of the planning and control process, providing data that can be used as information in decision-making process. In fact, they are a tool that allows uniform results to be obtained, measured and compared, making analyzes more rigorous and more reliable [13].

This way, an indicator is a measure of performance that is used to measure and analyze the results obtained in certain periods and must always be in agreement with the business areas, whose performance have the greatest impact on the success of the organization. An indicator is one quantitative expression or a mathematical relationship that numerically measures the attributes of a process or its results, in order to compare this measure with predetermined numerical goals [5][14].

Performance indicators can be classified as financial and non-financial. The first ones are generally expressed in monetary units and are calculated on the basis of the financial documents of the organizations, namely, income statement and balance sheet [15]. Non-financial indicators are useful when it is intended to deal with a perspective in the future, since they help managers to focus their actions on long-term perspectives [16]. It should also be noted that no single performance indicator is capable of promoting a clear representation of an organization's performance, nor can it focus on all relevant areas at the same time.

According to several authors (e.g., [17][18]), the selection of an indicator to be incorporated into a performance measurement system should take into account the following requirements:

- Selectivity: to be related to essential or critical factors of the evaluated process;
- Representativeness: be formulated so that it can represent the process or product to which it refers;
- Simplicity: easy understanding and application;
- Reduced cost: the cost for collecting, processing and evaluating information should not exceed the benefit achieved;
- Stability: to be an integral part of the internal processes of the organization, so as to make it possible to compare and analyze trends over time;
- Experimental approach: to test, in practice and in theory, the fundamental indicators;
- External comparison: allow to compare the performance of the organization with that of others, of the sector or other sectors;
- Accessibility (transparency): use, for the calculation, data that is easily accessible and available, preferably through visual mechanisms;
- Continuous improvement: periodically evaluate and, when necessary, modify or adjust indicators to match changes in the organizational environment and not lose their purpose and validity.

Thus, a system of performance indicators is a set of measures integrated at various levels (organization, processes and people), defined based on the strategy and objectives of the business unit, with the purpose of providing relevant information that facilitates the process of decision-making. This is part of the performance monitoring process, which aims to maximize the chances of success in achieving the commitments established in the strategic and annual plans of activities and budget [5]. In addition, this monitoring process reinforces the possibilities of success in the strategic and operational execution of the organization's commitments [1].

B. *Characteristics of KPI*

The KPI is a key indicator that evaluates the performance of the organization and is essential for its present and future [19]. There are thousands of indicators that can be used in management, and various types of indicators, financial and non-financial, should be used, defining for each [1]:

- Objective: it is the means of communication of strategic intentions. The objectives should clarify all employees, what the organization intends to achieve and in what period of time;
- Calculation formula: mathematical formula that intends to calculate the result of the indicator;
- Result: value reached by the organization in that time period;
- Goal: quantifies goal ambition and fosters the pursuit of desired outcomes;
- Deviation: difference between the goal and the value reached;
- Performance: usually expressed as a percentage, being the way to compare indicators with different units of measure;
- Evaluation: qualitative evaluation obtained through the performance result.

That being said, a KPI is a quantitative indicator that measures the performance of the system and processes within the organization, where the main goal is to analyze the effectiveness and efficiency of the measures that have been taken. The KPIs should be efficient, and for this purpose they should be small, divisive, i.e, broken down into more detailed indicators at the level of performance, simple, in order to facilitate the understanding of all the referred employees, as far as that users can see the origins and context of the KPI so that the information is more credible, correlated, balanced in type, aligned, so as not to jeopardize other KPIs, and validated, i.e, they must be tested before be applied in order to prevent further decisions [20].

C. *Characteristics of dashboards*

The dashboard is a tool that analyzes and evaluates the performances and risks of the company, through a single screen where the main performance indicators are [2]. The dashboard is a tool that analyzes and evaluates the performances and risks of the company, through a single screen where the main performance indicators are monitored.

It is therefore built so that managers can have easy, immediate and systematic access to the most relevant information on organizational performance. All the information that is stored in organizations' databases is more relevant if it is presented to its stakeholders and for which information is needed for decision making in the various types of situations [8]. In its implementation, it should be considered: the objective, the public, the impact, the data needed to analyze the problem, if necessary the use of filters and the format in which it will be presented (e.g., computer, smartphone and tablet) [21]. Thus, it exposes a set of relevant information, in the form of indicators, not only at the global level of the organization, but for any person, internal (from any hierarchical level [5]) or external to the organization [8].

Dashboards are made up of various types of graphs that allow you to monitor various types of data and support almost any kind of business objectives. Thus, in order to build a quality dashboard, it is necessary not only to understand how to organize graphically but also, which are the most appropriate graphs according to the needs of the end users [2][8][20].

D. *Dashboards in hospitality*

The choice of performance indicators to be used in the hotel sector involves a logical combination of procedures for the definition and implementation of a measurement and performance evaluation system. The first step to this should be the understanding of its core business, as well as the understanding of the breadth of application [22].

It should be noted that the indicators used in hospitality can be grouped into five dimensions [23]: i) economic-financial; ii) operations; iii) human resources; and iv) stakeholders. In addition, it is possible to see that non-financial measures are extremely important, since in hotels the provision of services are significantly dependent on the good performance of their intellectual capital [24].

With indicators already selected, follows the elaboration of a dashboard. For instance, the Wexford Hotel dashboard [25] reveals the predominance of graphical elements and the inclusion of a small number of indicators [2].

III. METHODOLOGY

In view of our pre-selected goals, the applied methodology is the qualitative exploratory one, resorting to interviews, semi structured, made to some financial managers. The interviews aim to identify the most relevant KPIs for managers in the hotel industry, to check how they analyze KPIs and to evaluate dashboards [26]. In another perspective, this research is a case study, characterizing a specific business situation, the Hotel Resort & SPA, which is a five-star hotel (resort) in the Algarve. It is for this organization that we propose dashboards, created with the tools of business intelligence (BI) of Excel.

The interviews focused on the business needs of the hotel sector, were conducted with the expectation of obtaining innovative and fundamental opinions, according to the professional experience of each interviewee. The interviewees were selected for convenience, representing five hotels, all located in the Algarve, with 3 to 5 stars, and with 100 or more rooms and more than 50 employees. Interviews with financial managers or administrators were held at the premises of each hotel between July 11, 2018 and August 7, 2018, lasting between forty and fifty minutes each. Interestingly, three hotels, which are part of the RR Hotels group, are run by the same individual, who is interviewed three times. This situation is justified because it monitors the hotels differently, depending on the type of hotel, the opening period and the type of packages available (all-inclusive or not). However, this fact can be seen as a limitation of this study.

The first part of the interview aims to know a little of each interviewee, with the questions being addressed in this sense, i.e., to know the gender, age, academic qualifications, professional experience and position. The purpose of the second part is to characterize each hotel. The questions being addressed aim to obtain information, such as the name and category of each hotel, turnover, number of employees, capacity of the hotel and the frequency with which the analysis of the performance is held in each hotel. The third part includes questions aimed at evaluating the application, knowledge and use of KPIs in hospitality and financial perspective, identifying the reasons why dashboards are not used as an accounting tool, as well as assessing utility, utilization and satisfaction of the use of dashboards in hotels.

Based on the responses, the KPIs to be included in the dashboard were defined. After the creation of this tool, the financial director of the hotel under study was asked to interpret each dashboard visualization element and respond to a closed dashboard evaluation question and three open questions to comment, in global and in a free form the monitoring tool.

The dashboards presented were produced with real data from the hotel under study, although transformed due to confidentiality issues, in an Excel 2016 spreadsheet. The charts were chosen according to the literature, allowing to identify the best colors and ways to demonstrate certain type of information (e.g., [2][8]). For the construction of the dashboard, the BI add-ins of Excel have been chosen, since this is a worldwide, widely used tool for data analysis. It is simple and easy to use, offering various functionalities for organizing and updating data, creating charts, forecasting and calculating operators or integrated functions [27].

IV. Results

The results of the interviews were presented in order to identify the monitoring practices and to understand which indicators are most used in the monitoring of hotel performance and why they are used. Also presented are the proposed dashboards and, in the end, the results of their evaluation, first with the interpretation of the dashboards and then with a quantitative evaluation of their usefulness.

A. Identification of monitoring practices

Only three hotels use this technique and are satisfied with the dashboards used to evaluate performance on a monthly basis as they present all the necessary information on a single screen, making their analysis faster and more efficient. The remaining two respondents think it would be useful to implement dashboards, since they analyze several tables with all sorts of information, which consumes them some time.

Respondents from hotels that do not use dashboard as an analysis tool recognize that "it would be useful for the hotel to implement it, since it optimizes time and analyzes it much faster and more effectively." Respondents from the other three hotels, which already use dashboard as a tool, find that their use is "useful in the sense that they optimize time, improve decision making, and help managers stay focused on pre-set goals."

It should be noted that the main reason why the two hotels do not use and / or not implement dashboards is that they do not have much time to implement such a tool, since its implementation is still a bit slow. In fact, before the implementation, an analysis must be performed on the company, in order to verify the most important KPIs and only then to elaborate the dashboard appropriate to the need.

B. Identification of relevant KPIs for financial managers

The responses of the interviewees allowed KPI to be grouped into four dimensions in order to be more perceptible and easier to understand. Thus, the KPIs were divided by the areas that have the most impact on hospitality, starting with the management of employees, followed by housing, F&B (food & beverage) and, last but not least, financial KPIs.

Regarding employee management, two indicators emerge: turnover rate and level of satisfaction/motivation. These important indicators in hospitality are negatively related, since unsatisfied employees tend to look for other organizations, which leads to their replacement.

In terms of accommodation, seven indicators were suggested. These indicators mainly reflect the occupancy of the hotel: occupancy, occupancy rate, average stay (average per person per room), average daily price (ADR), income per room available in a given period (RevPAR), total income and guest satisfaction

In relation to F&B, the two most referenced indicators are those that take into account the cost of food and drink and, therefore, the revenue of the same. This is due to the fact that all hotels take into account the waste that can essentially occur in food due to its short shelf life.

Finally, five financial indicators were suggested that allow us to evaluate the situation of the hotel and to check which points can be improved/altered to benefit the financial situation. These indicators aim to: (i) verify whether they have sufficient earnings to meet their short-term (Working Capital), (ii) determine their dependence on third parties, i.e., assess the medium- and long-term financial equilibrium (Financial Autonomy), (iii) evaluating the hotel's ability to meet its commitments in the medium term (Solvency), and (iv) measuring the efficiency of the use of the resources made available, i.e., assessing the company's management capacity through of management activity ratios (average payment period (APP) and average collection period (ACP).

C. Proposal for a dashboard and its evaluation

Two dashboards are proposed that aim to monitor the performance of the hotel at the strategic level. These allow to follow the evolution of the company in relation to their pre-established goals. One of which is elaborated in power pivot, where the information is presented monthly and yearly, and the other is elaborated in power view, where the information is presented with an annual periodicity.

On the one hand, the power pivot dashboard (Fig. 1) consists of 10 KPI, where all information is shown in only eight graphs. This presents some KPI in the same graph in order to compare the values directly over time, verifying their evolution. It is also worth mentioning that it is enough to select the months and years that are to be compared, so that they can be visualized in all monthly graphs, thus highlighting the interactivity of the dashboard. On the other hand, the dashboard elaborated in power view (also interactive) evaluates nine KPI, visualized in only three different graphic typologies (Fig. 2). It presents in a single table the ADR, RevPAR and the occupation, as well as their respective targets and alerts. These targets were developed according to the average forecast of each KPI.

It is noteworthy that both dashboards only show the indicators regarding housing and financial situation, as it is in these two areas that the hotel now focuses more on monitoring performance. It should also be noted that they allow filters in the years and months, but do not allow drill-down because the attributes of the tables do not constitute hierarchies. However, it is considered an important functionality and to develop in the future.

The two dashboards were presented to the interviewee, the hotel's financial director and future user of the monitoring instrument. It was requested, after its analysis, to evaluate the instrument overall. The interviewee says that, in general, "both dashboards are easy to interpret and can show the monthly / annual evolution and check if the evolution was as planned or not." On the other hand, on a scale of zero (not useful) to 10 (extremely useful), it evaluates its use in 8 points, justifying its classification by saying that "not all information is still useful, because much of it is not yet used. However, for the future it does not mean that it does not have a total utility. "

The interviewee also points out that the dashboards “allow us to see in what level the hotel is and what can be improved”. He also praises his presentation, since "in visual terms it is easy to interpret" and that he “would not change anything". On the other hand, he says that "being interactive can respond to current and future information needs". In conclusion, the financial director considers that the dashboards meet their needs, since they are quite pertinent and advantageous, especially considering the analysis of the monthly evolution that still could not be done. In fact, he says that "they are very useful at the moment, because it is time to prepare the budget for the year 2019 and we need a more detailed and comprehensive analysis. It is important to include the data for the year 2018 so that we can analyze our evolution and see if we need to change something in our strategy by the end of the year", in order to meet the pre-established goals.

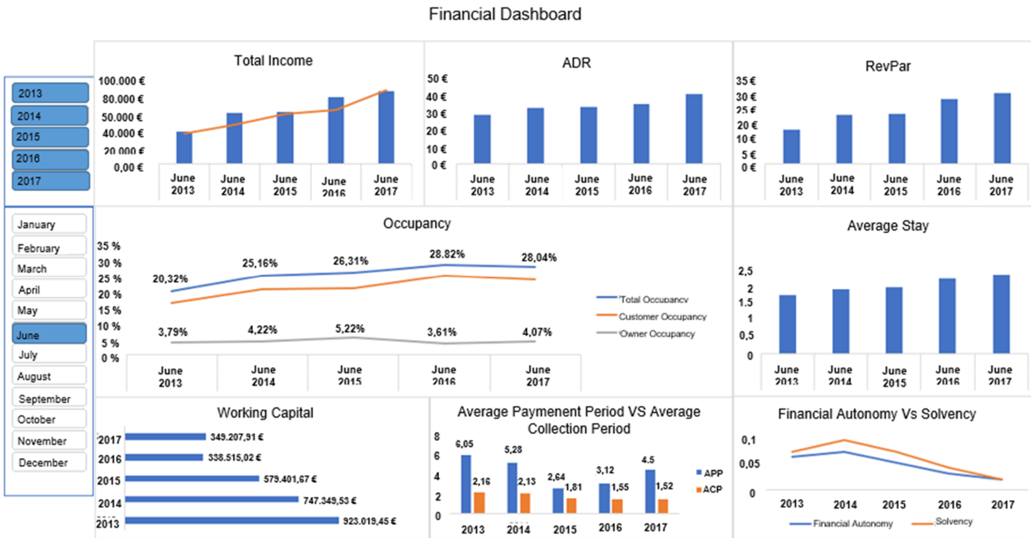

Figure 1- Financial Dashboard elaborated with Power Pivot

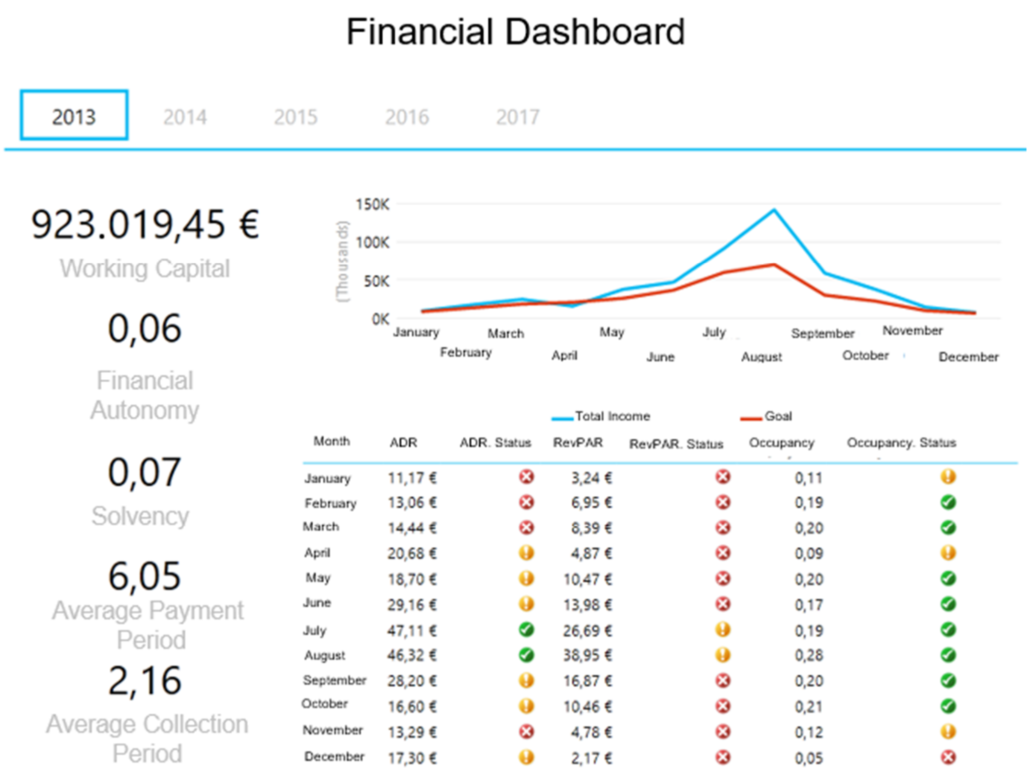

Figure 2- Financial Dashboard elaborated with Power View

V. Conclusions

The study aimed to create an adequate computer tool to monitor the performance of a hotel from the perspective of its manager / chief financial officer. For this purpose, indicators were identified that are of particular interest in hospitality industry, in its main dimensions of performance. However, in the particular case of the hotel under study, only 19 indicators relating to two dimensions were selected, i.e., the financial situation and accommodation.

Thus, the creation of two interactive dashboards in Excel, contributes to the professionals of the hotel industry, namely, to the financial managers, by providing a tool validated by one of those responsible in a program widely used in the organizations, due to its low cost and ease of use. These two features add on to the high flexibility and ability to present any layout desired by the user - in technical or design terms, and also allows all the know-how in the organization, even when the dashboard is developed by a subcontracted specialist.

On the other hand, the study contributes to the vast literature related to performance evaluation and data visualization, by adding an application of the use of dashboards in the hotel industry for the use of their financial managers, who have their own idiosyncrasies.

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