DOI 10.53681/z99tfk40

THE REVENUE MANAGEMENT IN THE PORTUGUESE HOTEL SECTOR - EMPIRICAL STUDY RELATING INSTITUTIONAL FACTORS TO THE ADOPTION OF RM PRACTICES

O REVENUE MANAGEMENT NO SECTOR HOTELEIRO PORTUGUÊS - ESTUDO EMPÍRICO QUE RELACIONA FATORES INSTITUCIONAIS COM A ADOÇÃO DE PRÁTICAS DE RM

António Ferreira[1]; *Rodrigo de Sousa*[2]; *Célia Ribeiro*[3]

Resumo

A gestão de receitas tem vindo a tornar-se cada vez mais importante no setor hoteleiro e tem desempenhado um papel fundamental na geração e otimização de receitas. Este conceito de gestão centra-se em políticas de preços concebidas para maximizar os lucros de uma organização. Utiliza modelos matemáticos para simular e prever as tendências da procura em todos os mercados e utiliza estudos de mercado de concorrência e de fatores humanos para definir as estratégias mais eficazes.

O objetivo deste estudo foi analisar se existe uma relação entre a classificação de uma unidade hoteleira específica e a existência de um departamento de Revenue Management (RM), se existe uma relação entre a localização geográfica de um hotel e a utilização de ferramentas de RM e se as cadeias hoteleiras são mais propensas a utilizar ferramentas de RM em comparação com os hotéis independentes. Foi realizado, portanto, um estudo transversal, descritivo-correlacional, quantitativo, utilizando-se um questionário adaptado de Costa (2017). A amostra foi constituída por 110 entrevistados, que enfatizaram a importância do RM nas operações hoteleiras. Os resultados sugerem que a implementação do RM é essencial para o setor hoteleiro em Portugal. Verificou-se que existe relação entre a localização da unidade hoteleira e a utilização de ferramentas de RM, e que as cadeias de hotéis utilizam mais ferramentas de RM do que os hotéis individuais. Concluiu-se, também, que não existe relação entre a classificação da Unidade Hoteleira e a utilização de ferramentas de RM.

Palavras-chave: Unidades hoteleiras; Gestão de Receitas; Portugal.

[1] António José Mendes Ferreira. Corresponding author ajmferreira@ucp.pt. Instituto de Gestão e das Organizações da Saúde. Universidade Católica Portuguesa. CEFAGE-UBI.
[2] Rodrigo Valentim Tavares de Sousa. rodrigo.valentim.sousa@gmail.com. Instituto de Gestão e das Organizações da Saúde. Universidade Católica Portuguesa.
[3] Célia dos Prazeres Ribeiro. cribeiro@ucp.pt. Instituto de Gestão e das Organizações da Saúde. Universidade Católica Portuguesa.

Abstract

Revenue management (RM) has become increasingly important in the hotel sector and has played a pivotal role in generating and optimising revenue. This approach aims to maximise organisational profitability. It uses mathematical models to simulate and forecast demand trends across markets and utilises competition market and human factors studies to define the most effective strategies.

The aim of this study was to examine whether there is a relationship between the classification of a specific hotel unit and the existence of a Revenue Management (RM) department, whether there is a relationship between the geographical location of a hotel and the use of RM tools, and whether hotel chains are more likely to use RM tools compared to independent hotels. A cross-sectional, descriptive-correlational, quantitative study was therefore conducted, using a questionnaire adapted from Costa (2017). The sample consisted of 110 respondents, who emphasised the importance of RM in hotel operations. The findings suggest that the implementation of RM is essential for the hotel sector in Portugal. It was found that there is a relationship between hotel location and the use of RM tools, and that hotel chains use more RM tools than individual hotels. It was also concluded that there is no relationship between the classification of the hotel unit and the use of RM tools.

Keywords: Hotel units; Revenue Management; Portugal.

INTRODUCTION

Revenue Management (RM) is primarily concerned with optimising financial performance and is especially important in sectors like the hospitality industry. Broadly defined, RM is a management technique used to maximise the revenue generated by the sale of a good or service, based on dynamic demand forecasting and market segmentation methods (Li *et al.*, 2024). It involves the strategic management of a product or service, with particular emphasis on two primary levers of production: pricing and inventory control (Landman, 2009).

RM extends beyond setting pricing policies and applying sales strategies, in other words, it involves a clear understanding of how to implement cancellation strategies and penalty policies that will encourage the consumer to make controlled choices and will ultimately benefit hotel operations. RM means selling the right product to the right customer at the right time for the right price (Cross, 2009). According to Kimes and Chase (1998), RM involves managing the 4 Cs of perishable service (Calendar, Clock, Capacity and Cost).

This term emerged in response to new trends and services within the hotel industry, which created a need to extend the practices associated to the aforementioned concepts to these new activities in order to significantly impact total revenue. This dynamic approach is closely related to marketing and customer relationship

management at every touchpoint, i.e., any point of contact between a guest and the hotel, and across its different operational areas (Landman, 2011).

In essence, as Cross (2009) argues, this approach implies having the ability to decide not to sell a room at a low price today, but rather to sell it tomorrow at a higher price. However, if demand is low, one must be capable of deciding to sell the room at a lower price. Therefore, this practice requires a deep understanding of the market, segmenting it and adjusting it to your product by offering prices in line with the competition, i.e., it is not just about maximising sales during peak seasons, but addressing off season demand by adjusting prices according to the level of demand (Cross, 2009; Lei *et al.*, 2024).

The aim of this study is to examine whether there is a relationship between the classification of a hotel and the existence of an RM department, whether there is a relationship between the geographical location of the hotel and the use of RM tools, and whether hotel chains use more RM tools compared to independent hotels.

LITERATURE REVIEW

HISTORICAL FRAMEWORK OF THE RM CONCEPT

The hospitality sector has evolved over time. As a result, the industry has improved and has been able to address the gaps that have emerged over the years (Lo *et al.*, 2010). Nowadays, the hotel industry is very much about online sales, which has led to the emergence of different business areas, platforms, and software tools designed to support and facilitate business development (Moula *et al.*, 2024). One such area is RM.

RM originated in the American airline industry, more specifically with Robert Crandall, the CEO of America Airlines, who was seen as a pioneer in applying the Yield Management technique. This approach focused on maximising revenue through analytics-based inventory control. In 1985, to counter a mild recession in the segment and the rising market share of low-cost airlines, America Airlines announced its Ultimate Super Saver Fares, offering prices lower than those of the competition (Li *et al.*, 2024).

These fares were non-refundable and were valid only for trips acquired in advance and subject to strict purchase restrictions and control. As a result, America Airlines' revenues increased by 14.5% and additional profits were up to 47.8% (Hanks *et al.*, 1992). Given this success, it wasn't long before other market segments began to adapt and implement the same technique. One such segment was the hotel industry. In fact, Robert Crandall himself discussed the success of his strategy with J. W. 'Bill' Marriott Jr, CEO of Marriott International. During their meetings they discovered that Marriott International faced many of the same challenges as America Airlines, such as perishable inventory, advance sales, lower cost competition, and wide swings in balancing supply and demand (Lo *et al.*, 2010). Since the term 'yield' was more commonly associated with the airline industry than with the hotel industry, Marriott renamed this practice RM (Hanks *et al.*, 1992).

RM is a management technique used to maximise the revenue generated by the sale of a good or service, based on dynamic demand forecasting and market segmentation methods. It is in essence the strategic management of a product or service, with particular emphasis on two main production levers, pricing and inventory control (Landman, 2009). A similar trend is currently occurring in the hotel industry in terms of booking and cancellation policies. RM involves much more than just setting pricing policies and applying sales strategies, it also involves knowing how to implement cancellation strategies and penalty policies that will encourage consumers to make more controlled decisions that will ultimately benefit hotel companies (Moula *et al.*, 2024). If the concept of RM were to be defined in a single sentence, it would be: to sell the right product to the right customer at the right time for the right price (Cross, 2009).

However, the concept of RM has also evolved significantly, driven by advances in technology and a deeper understanding of the topic. It is now believed that RM encompasses much more than its original definition. It goes beyond merely selling the right product to the right customer at the right time and for the right price. It also involves selecting the right distribution channel and securing the best possible commission rates (Landman, 2011). It involves being able to decide not to sell a room at a lower price today and sell it tomorrow at a higher price. However, if demand is low, one should be able to decide to sell the room today at a lower price (Ferreiro, 2010; Moula *et al.*, 2024). To implement such a method, you must have deep understanding of the market, segmenting and adjusting your product by aligning prices with those charged by the competition (Kocourek *et al.*, 2023). It's not just about maximising peak season sales, but addressing off-season demands by adjusting prices according to the demand level (Chen *et al.*, 2024; Cross, 2009).

RM can therefore be defined as a continuous method involving Individuals, Procedures, and Tools, all supported by a balanced combination of processes, people and technology to obtain the best possible revenue (Kuokkanen, 2024; Lo *et al.*, 2010). All these methodologies contribute to the creation of a Revenue Management culture. In recent years, RM has evolved significantly, becoming both a strategic and tactical support for any hotel's commercial decisions (Moula *et al.*, 2024). Its capacity to provide commercial analysis and advice, as well as its ability to optimise inventory management have also advanced considerably over the years (Jayaram *et al.*, 2024).

YIELD MANAGEMENT AND RM.

It is also important to distinguish between Yield Management and RM. Yield Management focuses on managing rate availability in order to maximise revenue and occupancy (Lo *et al.*, 2010), which will contribute to optimising the hotel's performance. This approach is shaped by the company's strategy, market positioning, and purchase timing (Lo *et al.*, 2010). Yield Management is therefore a tool used to optimise pricing and automatic occupancy rates and its primary objective is to increase both occupancy and revenue in tourist accommodation (Kuokkanen, 2024).

As advancements have been made in this field, various new concepts have emerged and become intertwined, which has occasionally led to misinterpretations.

This study will clarify each of these terms by drawing from the scientific literature, ensuring their use is well-defined and consensual.

Let's start by addressing the most common mistakes involving the terms Yield Management and RM.

A number of authors have attempted to define the concept of Yield Management (YM) over time. The definitions they offered are presented in the table below.

Table 1. Definitions of Yield Management (YM)

Author	Definition
Sieburgh (1988)	YM is a set of procedures used to control room rates and occupancy
Nykiel (1989)	YM is defined as selling each room to the customer willing to pay the highest price so as to achieve the highest revenue.
Kimes (1989)	YM can be applied when capacity is fixed; demand fluctuates and can be segmented; when inventory is perishable; the product is sold well ahead of consumption; and sales costs are low compared to production costs.
Relihan (1989)	YM is an application of economic principles to pricing and room inventory.
Jones e Hamilton (1992)	YM is a strategy to maximize guest room rates when demand exceeds supply and to maximize occupancy when supply exceeds demand
Lieberman(1993)	YM is neither a computer system nor a set of mathematical techniques. YM is a tool with the capacity to bring about higher revenue and customer service capabilities through a combination of information systems, technology, probability, statistics, organizational theory, and business experience and knowledge.
Griffin (1994)	YM is a process whose ai mis to increase business profitability.
Schmidgall(1995)	YM is selling rooms in a way that maximizes total room revenue, rather than trying to sell all available rooms
Donaghy *et al.*(1995)	Profit maximization is the primary goal for YM

Vallen e Vallen (1996)	YM is defined as a systemized occupancy/price strategy for controlling the rates and restricting the occupancy to maximize room revenue
Gary (1996)	YM is a programme used to restrict or eliminate low-rated rates when demand is high and to seek lower-rate markets when demand is low.
GU; CANEEN, (1998).	YM is a tool used to extract the highest possible revenue from a given existing capacity

Source: www.univali.br/periódicos. Adapted.

RM CONCEPTUALIZATION

RM, on the other hand, is primarily focused on the hotel industry and has progressively gained wider recognition. Kimes and Chase (1998) defined RM as the management of the 4Cs (Calendar, Clock, Cost and Capacity). By effectively managing planning, timing, inventory, and pricing, hotels can present a value-added proposition to the customer that will distinguish them from the competition. Proper implementation of these processes leads to revenue maximisation (Chen *et al.*, 2024; Costa, 2017; Ryals and Payne, 2001).

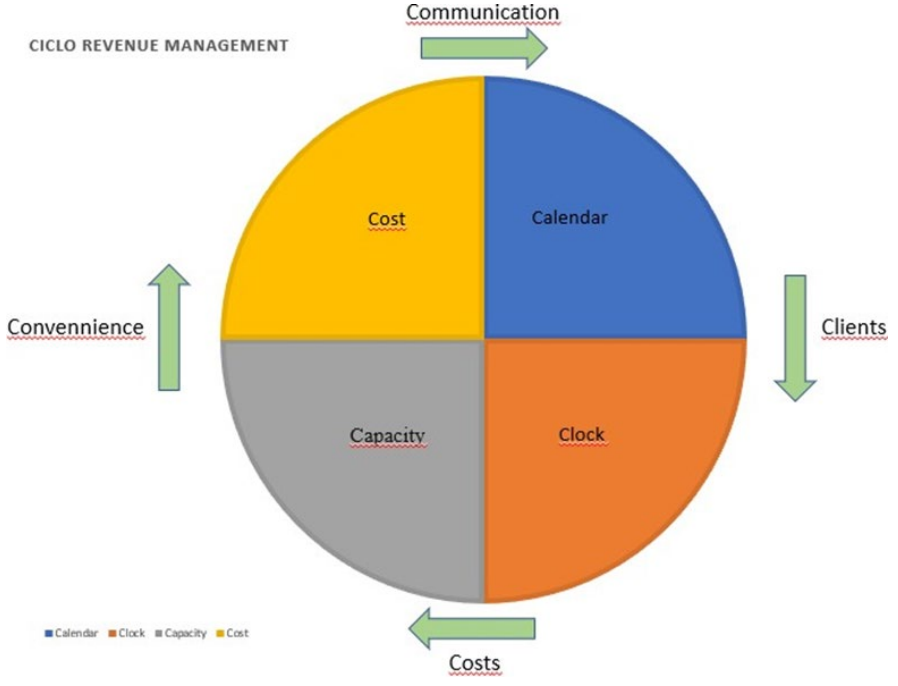


Figure 1. RM cycle

Source: Own elaboration, adapted from Kimes & Chase's 4 Cs (1998).

By analysing the planning history (calendar), it is possible to gain valuable insights into the demand patterns and trends for each hotel (Kimes & Chase, 1998). Indicators such as occupancy, average daily rate, market segment, among others, enable the hotel to position itself relative to the competition and better understand consumer needs (customers) (Long & Belobaba, 2024). Achieving the right timing (clock) combined with a well-adjusted price will have a significant impact on how much satisfied customers are willing to pay (costs) for the services provided by the hotel (Kimes & Chase, 1998; Moula *et al.*, 2024; Slattery, 2002).

To understand our current pattern, we need to analyse our forecast and demand curve. An accurate analysis of these indicators allows us to effectively manage inventory (capacity) and align it with our business situation, making it easier for customers to purchase our products and services (convenience) (Kimes & Chase, 1998; Revenue, 2020).

Average daily rates (cost) or pricing strategies vary from unit to unit, depending on the market segment, the selected distribution channels, planned discounts and campaigns, as well as the competitive positioning of other hotels (Lo *et al.*, 2010). Rate management will depend on the hotel's strategy and communication approach (communication) (Kimes & Chase, 1998; Chen & Propovich, 2003).

With the emergence of new trends and services in the sector, hotel industry had to adapt and incorporate new key success indicators that complement those already in place. Indicators such as occupancy or average daily rates (ADR) are now complemented by others of great importance (Li *et al.* 2024). RevPOR, for instance, which stands for revenue per occupied room, has contributed to increasing hotel revenues worldwide (Landman, 2009).

However, none of these ratios, by themselves, fully capture the state and evolution of the hotel business. It is essential to conduct a joint study to effectively understand the importance of each one of them for hotel managers. These practices should also be complemented by overbooking policies designed to mitigate the negative impact of cancellations (Landman, 2009; Chang *et al.*, 2019).

METHOD

Considering the importance of RM to hotel units, this research defined the following objectives:

- to determine whether there is a relationship between a hotel classification and the existence of an RM department;
- to establish if there is a correlation between the geographical location of a hotel unit and the use of RM tools;
- to assess whether hotel chains use more RM tools than individual hotels.

Research begins with the identification of a problem, which guides the formulation of hypotheses. This will prompt the search for a ‘probable, supposed and provisional’ answer that will subsequently lead to the formulation of a research

hypothesis (Marconi & Lakatos, 2004). That way, based on the problem under study and the objectives previously defined, this research will seek to establish relationships between the variables and formulate the research hypotheses to be examined:

H1: There is a relationship between the classification of a hotel unit and the presence of an RM department;

H2: There is a correlation between the geographical location of a hotel and the use of RM tools;

H3: Hotel chains use more RM tools than individual hotels.

In an empirical study, defining a conceptual model is a major step in establishing guidelines to determine and implement an idea. In other words, outlining the conceptual framework of an empirical study allows for rigorous organisation of thought through a meaningful and structured process. Therefore, this study took into account the appropriateness of the structure used to obtain answers, the formulated objectives and research hypotheses, and seeks to describe variables and analyse the causal relationships between them (Coutinho, 2014).

To summarise, based on the objectives' framework and the delimitation of the variables, figure 2 illustrates the schematic representation of the relationships between the independent and dependent variables. The dependent variable (existence/use of RM tools) is measured using the following items: importance of characteristics, importance of dynamics, main functions, relevance of Key Performance Indicators (KPIs) and significance of the activity (Costa, 2017).

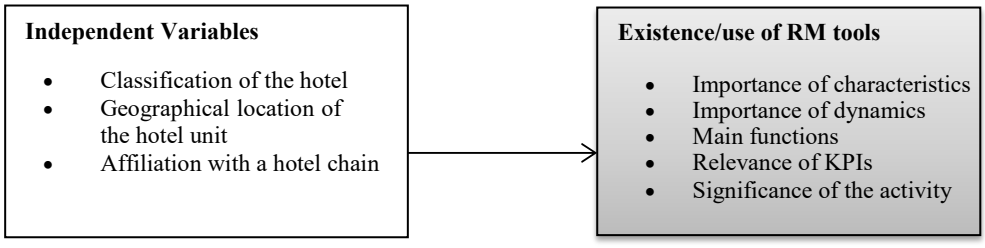


Figure 2. Schematic representation of the relationships between the independent and dependent variables

The target population for this study consists of Portuguese hotel managers. To collect the data, an email was sent to a database of 2, 3, 4 and 5-star Portuguese hotels, obtained from the Turismo de Portugal website. The population considered included 1829 hotels. The questionnaire used was adapted from Costa (2017). This is non-probabilistic sampling. The surveys were carried out in the months of September and October 2024, with a pre-test being carried out on 2 hotel unit managers. Data analysis was performed using SPSS software.

The sample comprised 110 participants, with 61.8% male and 38.2% female (see table 2).

Table 2. Distribution of the sample by gender

Gender	N	%
Female	42	38,2
Male	68	61,8
Total	**110**	**100,0**

Data shows that the majority of hotels are located in Lisbon (42.7%), followed by the Centre (28.2%) and Northern (25.5%) regions. The Algarve accounts for 16.4% of the hotel locations, while the Southern region (5.5%) is less represented (see table 3). The N values exceed the number of participants since respondents could indicate more than one location per questionnaire.

Table 3. Location of the hotel unit

Location of the hotel units	N	%
Northern region	28	25,5
Centre	31	28,2
Lisbon	47	42,7
Algarve	18	16,4
Azores	9	8,2
Madeira	7	6,4
Southern region	6	5,5

The sample was primarily composed of 4-star hotels (36.4%), followed by those with 3-star and 5-star ratings (19.1%). It should also be noted that 16.4% of these hotels have either a 4 or 5-star rating (see table 4).

Table 4. Classification of the hotel unit

Classification of the hotel unit	N	%
2-star hotels	1	,9
2-star, 4-star, 5-star hotels	1	,9
3-star hotels	21	19,1
3-star, 4-star hotels	3	2,7
3-star, 4-star, 5-star hotels	5	4,5
4-star hotels	40	36,4
4-star, 5-star hotels	18	16,4
5-star hotels	21	19,1
Total	**110**	**100,0**

According to the data presented in Table 5, 50.9% of the hotels are independent, while 49.1% are part of a hotel chain.

Table 5. Affiliation with a hotel chain

Are the hotels part of a hotel chain?	N	%
Yes	54	49,1
No	56	50,9
Total	**110**	**100,0**

ANALYSIS AND DISCUSSION OF RESULTS

The data obtained from the analysis of the results provide an answer to the objectives set and a clear basis for confirming or refuting the research hypotheses.

Regarding H1, **There is a relationship between the classification of the hotel unit and the existence of an RM department**, results demonstrate that there are no statistically significant differences between the classification of the hotel as a 2-star unit and the existence of an RM department. Overall, it can be observed that the highest mean rank values are found among managers of 2-star hotels for all items, except the "importance of characteristics" item. In this particular item, the highest value is observed for hotels that do not have a 2-star rating (see table 6).

Table 6. Relationship between the hotel 2-star rating and the existence of a RM department (Mann-Whitney U test)

Does the hotel have a 2-star rating?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	55,54	53,50	104,000	,928
Importance of dynamics	55,04	80,25	58,500	,266
Main functions	55,13	75,50	68,000	,368
Relevance of KPIs	55,27	68,00	83,000	,573
Significance of the activity	54,83	91,50	36,000	,106

The results obtained show that the fact that the hotel has a 3-star rating is not statistically significant. However, scores are higher for items such as "importance of characteristics", "importance of dynamics" and "main functions" among managers of 3-star hotels. In contrast, the score for the "relevance of KPIs" item is higher among managers whose hotel does not have a 3-star rating (see table 7).

Table 7. Relationship between the 3-star rating of the hotel and the existence of an RM department (Mann-Whitney U test)

Does the hotel have a 3-star rating?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	53,23	61,84	990,500	,210
Importance of dynamics	53,15	62,05	984,500	,196
Main functions	54,94	57,05	1129,500	,759
Relevance of KPIs	56,37	53,07	1104,000	,630
Significance of the activity	56,15	53,69	1122,000	,721

No statistically significant differences were found between the fact that the hotel has a 4-star rating and the variables under study. However, based on the mean rank values displayed, the highest scores were achieved by managers of 4-star hotels, which clearly shows the importance they attach to each variable under study (see table 8).

Table 8. Relationship between the 4-star rating of the hotel and the existence of an RM department (Mann-Whitney U test)

Does the hotel have a 4-star rating?	No	Sim	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	52,48	57,44	1310,500	,423
Importance of dynamics	51,55	58,04	1270,500	,296
Main functions	52,45	57,46	1309,500	,420
Relevance of KPIs	51,52	58,05	1269,500	,291
Significance of the activity	53,29	56,92	1345,500	,560

According to the data presented in table 9, no statistically significant differences were found between the groups. However, an analysis of the mean rank values reveals that the highest scores were obtained by the participants whose hotel is not classified as 5-star unit. These higher scores were observed for all items, except for the "relevance of KPIs" item. In this specific dimension, higher scores were obtained by managers of 5-star hotels. These results are in agreement with the study by Kuokkanen (2024).

Table 9. Relationship between the 5-star rating of the hotel and the existence of an RM department (Mann-Whitney U test)

Does the hotel have a 5-star rating?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	57,91	52,02	1306,000	,339
Importance of dynamics	56,27	54,39	1412,500	,760
Main functions	56,95	53,41	1368,500	,566
Relevance of KPIs	54,49	56,96	1397,000	,688
Significance of the activity	59,12	50,27	1227,000	,151

As for hypothesis H2: There is a relationship between the geographical location of the hotel and the use of RM tools, no relationship was found between the fact that the hotel was located in the Northern region of Portugal and the use of RM tools. However, results show that the participants whose hotels are located in the northern part of the country scored highest on items such as "importance of characteristics", "main functions", and "significance of the activity". In contrast, higher scores for the "importance of dynamics" and "relevance of KPIs" items were observed among managers of hotels located in other regions of the country (see table 10).

Table 10. Relationship between hotel location in northern Portugal and the use of RM tools (Mann-Whitney U test)

Is the hotel located in the Northern Region of the country?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	54,20	59,32	1041,000	,461
Importance of dynamics	55,99	54,05	1107,500	,780
Main functions	54,48	58,48	1064,500	,565
Relevance of KPIs	56,65	52,13	1053,500	,513
Significance of the activity	55,46	55,63	1144,500	,981

Similarly, the fact that the hotel is located in the Centre of Portugal does not statistically interfere with the use of RM tools. However, results clearly demonstrate that the participants who attach greater importance to items like "importance of characteristics", "importance of dynamics" and "main functions" are those whose hotels are not located in the central region of the country. In contrast, the highest scores for items such as "relevance of KPIs" and "significance of the activity" are observed among managers of hotels located in that specific region (see table 11).

Table 11. Relationship between hotel location in the Centre region of Portugal and the use of RM tools (Mann-Whitney U test)

Is the hotel located in the Centre region of the country?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	56,09	53,98	1177,500	,754
Importance of dynamics	56,70	52,45	1130,000	,528
Main functions	57,08	51,47	1099,500	,404
Relevance of KPIs	54,44	58,21	1140,500	,574
Significance of the activity	57,15	51,29	1094,000	3,85

The results show that the participants whose hotels are located in Lisbon place greater importance on items such as "importance of characteristics" (p=0.013), "main functions" (p=0.008), and "significance of the activity" (p=0.000), which indicates the existence of statistically significant differences (see table 12).

Table 12. Relationship between hotel location in Lisbon and the use of RM tools (Mann-Whitney U test)

Is the hotel located in Lisbon?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	62,01	46,78	1070,500	**,013**
Importance of dynamics	57,67	52,59	1343,500	,406
Main functions	62,48	46,15	1041,000	**,008**
Relevance of KPIs	56,17	54,60	1438,000	,796
Significance of the activity	65,87	41,60	827,000	**,000**

The location of the hotel in the Algarve does not interfere with the use of RM tools. However, participants whose hotels were located in the Algarve scored highest on nearly all items, except for the "significance of KPIs" item (see table 13).

Table 13. Relationship between the hotel location in the Algarve and the use of RM tools (Mann-Whitney U test)

Is the hotel located in the Algarve?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	53,78	64,31	669,500	,198
Importance of dynamics	53,27	66,89	623,000	,096
Main functions	53,52	65,61	646,000	,139
Relevance of KPIs	55,95	53,22	787,000	,738
Significance of the activity	55,46	55,72	824,000	,974

As for the relationship between the hotel being located in the Azores and the use of RM tools, no statistically significant differences were found. However, participants whose hotel was located in the Azores scored higher on nearly all items, except for the "importance of dynamics" item, where managers of hotels located outside the Azores scored higher (see table 14).

Table 14. Relationship between the hotel location in the Azores and the use of RM tools (Mann-Whitney U test)

Is the hotel located in the Azores?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	54,89	62,33	393,000	,500
Importance of dynamics	55,73	52,94	431,500	,801
Main functions	53,97	72,72	299,500	,089
Relevance of KPIs	54,69	64,56	373,000	,370
Significance of the activity	54,71	64,33	375,000	,385

The fact that the hotel is located in Madeira has a statistically significant effect on the use of RM tools. This significance is particularly evident in items such as "importance of characteristics "(p=0.021) and "relevance of KPIs" (0.012) (see table 15).

Table 15. Relationship between the hotel location in Madeira and the use of RM tools (Mann-Whitney U test)

Is the hotel located in Madeira?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	53,68	82,29	173,000	,021
Importance of dynamics	53,98	77,93	203,500	,054
Main functions	54,44	71,07	251,500	,180
Relevance of KPIs	53,53	84,50	157,500	,012
Significance of the activity	54,09	76,21	215,500	,075

No relationship was found between the location of the hotel in the Southern region of Portugal and the use of RM tools. However, the highest mean rank values are found among participants whose hotels are located in the south of Portugal, with the highest scores being observed for the "importance of dynamics" and "main functions" items (see table 16). These results are at odds with the study of Moula *et al.* (2024).

Table 16. Relationship between the hotel location in the Southern region of Portugal and the use of RM tools (Mann-Whitney U test)

Is the hotel located in the Southern region of Portugal?	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	54,69	69,58	227,500	,264
Importance of dynamics	54,37	75,17	194,000	,119
Main functions	54,48	73,17	206,000	,161
Relevance of KPIs	55,01	64,00	261,000	,499
Significance of the activity	54,80	67,67	239,000	,335

As for H3: Hotel chains use more RM tools than individual hotels, the results indicate that managers of independent hotels attach greater importance to items such as "importance of characteristics" of RM tools and "main functions" of RM activity. In contrast, participants whose hotels are part of a chain seem to place greater importance on the "relevance of KPIs". A statistically significant difference can be observed (p=0.008) in this specific case (see table 17). These results are in agreement with the study by Li *et al.* (2024)

Table 17. Relationship between hotel chain affiliation and the use of RM tools (Mann- Whitney U test)

The hotel is part of a chain	No	Yes	MWU	p
	Mean Rank	Mean Rank		
Importance of characteristics	55,94	55,07	1488,000	,885
Importance of dynamics	52,25	58,63	1336,500	,292
Main functions	54,98	56,00	1484,000	,866
Relevance of KPIs	47,35	63,36	1072,000	,008
Significance of the activity	60,41	50,77	1247,000	,112

In summary, no relationship was found between the classification of a hotel and the existence of an RM department. However, it is worth noting that larger hotels are more likely to have an RM department. Hotel chains, regardless of their classification, should already have an RM department.

Evidence shows the existence of a relationship between the geographical location of the hotel and the use of RM tools. This can be explained by the higher use of RM tools in larger cities and centres with a greater concentration of hotels. It could be said that RM tools are more widely used in Lisbon, followed by Porto and the Algarve, as these areas face greater competition and, therefore, require more effective tools and resources.

Finally, the results indicate that hotel chains use more RM tools than individual hotels. This can be explained by the fact that hotel chains are very large and highly complex structures that require a more precise monitoring, which makes RM departments essential.

FINAL CONSIDERATIONS

This study clearly shows that RM has become a crucial asset in the hotel sector's process of creating and optimising revenue. This approach aims to maximise organisational profitability. It relies on mathematical models, simulations, and forecasts of market segment demand trends, competitive analysis, and the human factor, when time comes to determine the best possible strategy. It also enabled researchers to answer the research hypotheses and achieve the objectives previously defined.

The study concluded that most of the respondents already use RM tools in their hotel unit, clearly highlighting the growing importance of this area in the national hotel industry.

No relationship was found between the classification of a hotel and the existence of an RM department, which definitely rejects H1. However, it should be noted that larger hotels are more likely to have an RM department. In contrast, there is evidence of a relationship between the geographical location of a hotel and the use of

RM tools, which confirms H2. This relationship can be justified by the fact that the major centres (Lisbon, Porto and the Algarve) face a greater concentration of hotels and that this increased competition requires the use of more RM tools. The study also demonstrates that hotel chains use more RM tools than individual hotels, which confirms H3. This can be explained by the fact that hotel chains are highly complex structures, where the functions of all affiliated hotels are centralised, requiring more detailed and effective monitoring. This study has contributed to the development of various professional skills and, as such, serves as a valuable contribution to improving the daily performance of the hospitality sector. It highlights the need for greater recognition of RM in Portugal at a time when resistance to its advantages still persists. Hopefully this study will help raise awareness within the hotel industry and draw attention to the importance of such area. Given the high competition in this sector, it is recommended that hotel units increasingly use better RM tools in order to maximize their revenues.

The primary limitation of this study lies in the size of the sample. A larger sample would have allowed us to draw more robust conclusions. Other institutional factors should have been studied, such as size, age of the hotel, etc. The degree of competition that each hotel unit has to face should also be taken into account.

Future research should consider studying other factors that may influence the use of RM tools and not merely those examined in this study (hotel classification, geographical location, and affiliation with a hotel chain). Additionally, a comparative study of RM practices implemented in other countries is recommended.

REFERENCES

Chang, H., Chen, H., Chen, J & Reichelt, K. (2019). Do Supply Chain Auditors Compromise? Evidence From the Association of Supplier Aggressive Revenue Management and Major Customer Dependence. Journal of Accounting, Auditing & Finance, vol. 34, issue 4, p. 639-666. DOI: 10.1177/0148558X18755282.

Chen, G., Li, X. & Ye, Y. (2024). Technical Note - An Improved Analysis of LP-Based Control for Revenue Management. Operations Research, vol. 72, issue 3, p.1124-1138. DOI: 10.1287/opre.2022.2358.

Chen, K., Jia, S., Wang, J., Yang, D. & Ding, Y. (2024). Dual-channel ticketing and pricing strategies in cruise revenue management. Maritime Policy & Management, vol. 51, issue 5, p. 781-804. DOI: 10.1080/03088839.2023.2224376.

Chen, I., & Propovich, K. (2003). Understanding customer relationship management (CRM). People, process and technology. Business Process Management Journal, pp. 672-688.

Costa, M. J. (2017). Total Hotel Revenue Management em Portugal. Total Hotel Revenue Management em Portugal, pp. 177-185.

Coutinho, C.P. (2014). Metodologia de Investigação em Ciências Sociais e Humanas: Teoria e Prática. Coimbra: Almedina.

Cross, R. G. (2009). Revenue management´s renaissance: A rebirth of the art and science of profitable revenue generation. USA: Cornell Hospitallity Quarterly.

Ferreiro, S. (2010). O Software de Gestão Hoteleira em Resorts. O Caso do Complexo Bávaro do Grupo Iberostar, pp. 36-44.

Hanks, R. D., Cross, R. G., & Noland, P. R. (1992). Discounting in the hotel industry: A new approch (Vol. 33). USA: The Cornell Hotel and Restaurant Administration Quarterly.

Kimes, S. E., & Chase, R. B. (1998). The strategic levers of yield management. USA: Journal of Service Research.

Kocourek, M., Chalupa, S. & Jakubikova, D. (2023). The current state of the application of revenue management activities in the SME segment: A case from the Czech Republic. Quality - Access to Success, vol. 24, Issue 197, p1-7. DOI: 10.47750/QAS/24.197.01.

Kuokkanen, H. (2024).Strategic levers of revenue management: a three-dimensional model to categorize industries. Journal of Revenue & Pricing Management, vol. 23, issue 4, p 369-376. DOI: 10.1057/s41272-024-00484-8.

Jayaram, A., Amit, R., Agarwal, A. & Luo, X. (2024). Elasticity-integrated pricing and allocation heuristic for airline revenue management. Journal of Revenue & Pricing Management, vol. 23, issue 4, p 305-317. DOI: 10.1057/s41272-023-00454-6.

Landman, P. (2009). What is the Definition of Revenue Management. What is the Definition of Revenue Management.

Landman, P. (2011). Leadership in Revenue Management. Leadership in Revenue Management. Obtido de http://www.xotels.com/images/Revenue-Management- Manual-Xotels.pdf

Lei, Y., Miao, S. & Momot, R. (2024). Privacy-Preserving Personalized Revenue Management. Management Science, vol. 70, issue 7, p. 4875-4892. DOI: 10.1287/mnsc.2023.4925.

Li, B., Guo, X. & Liang, L. (2024). Optimal pricing decision and capacity allocation of opaque selling in airline revenue management. Journal of Revenue & Pricing Management, vol. 23, issue 4, p356-368. DOI: 10.1057/s41272-024-00483-9.

Lo, A., Stalcup, L., & Lee, A. (2010). Customer relationship management for hotels in Hong Kong. . Internation Jounal of Contemporary Hospitality Management, pp. 139-159.

Long, Y. & Belobaba, P. (2024). Airline revenue management with segmented continuous pricing: methods and competitive effects. Journal of Revenue & Pricing Management, vol. 23, issue 1, p. 14-27. DOI: 10.1057/s41272-023-00462-6.

Marconi, M. A., & Lakatos, E. V. (2004). Metodologia científica. São Paulo: Editora Atlas.

Moula, H., Yaghoubyan, S., Malekhosseini, R & Bagherifard, K. (2024). Customer type discovery in hotel revenue management: a data mining approach. Journal of Revenue & Pricing Management, vol. 23, issue 3, p. 238-248. DOI: 10.1057/s41272-024-00474

Revenue, R. O. (2020). Revenue Management System (RMS): What Are the Advantages? Obtido de Revenue Management System (RMS): What Are the Advantages?: https://www.revfine.com/revenue-management-system/

Ryals, L., & Payne, A. (2001). Customer relationship management in financial services. Towards information-enabled relationship marketing. Journal of Strategic Marketing, pp. 3-27.

Slattery, P. (2002). Reported RevPAR: unreliable measures, flawed interpretations and the remedy. Hospitality Management, pp. 135-149.