

IDENTIFICATION OF THE USE OF REVENUE MANAGEMENT TOOLS IN ACCOMMODATION SERVICES

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Abstract: The presented paper focuses on the problem of using revenue management tools in the hospitality industry. The research uses a quantitative method based on the questionnaire (n = 254). The research locality is the Czech Republic, and the survey was done during the years 2017 - 2021. One of the results says that tools based on the price are more often used than tools based on the managing capacity. The most typical tool related to the price is discounts and the intuition of the responsible person. Based on the hypothesis testing, we can say that dynamic prices and tools that work with occupancy are used in the larger hotel more often.

Keywords: Accommodation, Hotel, Hospitality, Revenue Management

1 Introduction

The presented article is focused on determining the rate of use of revenue management tools in the hotel industry in the Czech Republic. Revenue management is a crucial discipline whose foremost objective is to maximize revenue, which should, however, always respect the sub-objectives of the company as a whole. Among the tools used in revenue management, two primary groups can be mentioned: price and non-price instruments (Ivanov, 2014). Non-price instruments include, in particular, capacity adjustment instruments and other instruments (for more, see Ahmad et al., 2016; Belobaba, 1987; Li and Ma, 2016 or Valdés, 2005).

The research, which is the subject of this article, aims to identify the level of use of revenue management tools in accommodation services. The identification was based on a quantitative study using a questionnaire survey. For selected characteristics, which were determined in the questionnaire survey, hypotheses were tested to ascertain a statistically significant relationship. The evaluation was performed based on the following two-side hypothesis tests:

$$H_0: r = 0$$

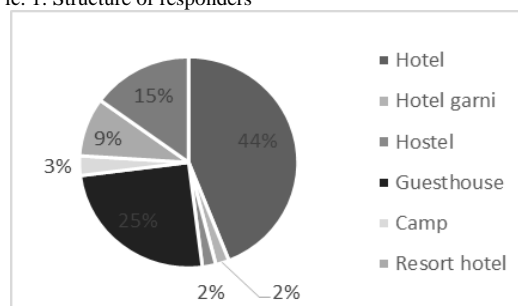
$$H_A: r \neq 0$$

The tools are mainly used to discuss dynamic prices in the current conditions (e.g. Bandalouski et al., 2021; Aziz et al., 2011 or Vives et al., 2018). Valdés (2005) describes tools that adjust the selling price and their importance for accommodation facilities. It was concluded that the correct combination of price and prediction models is crucial for accommodation. Raza (2015), for example, states a different approach to working with price through the so-called differentiation. A combination of price optimization and more advanced tools using knowledge of the behaviour of individual segments is presented in a study from 2019 (Vives et al., 2019). In addition to price and quantity adjustment tools, emphasis is often placed on tools that work with the prediction (Pereira, 2016). A survey with a similar focus as in this article was conducted in Italy (Ivanov et al., 2021). The key findings of the research show that individual accommodation facilities are not uniform in the practical application of revenue management, and what plays a crucial role in distinguishing whether an accommodation facility applies revenue management at an adequate level is, in particular, the size, location and class of the hotel. Similar output of this research was published in the monograph published in 2021 (Petříček, 2021). The output presented in this article is based on the same questionnaire but use higher and different number of questionnaires obtained.

2 Materials and methods

The questionnaire survey was carried out by collecting data in the years 2017 - 2021. The subject of the research was accommodation facilities in the Czech Republic. More than 3,000 respondents were contacted, and 254 relevant questionnaires were obtained. The structure of the respondents is shown in the following chart (Pic. 1).

Pic. 1: Structure of responders



Source: own processing

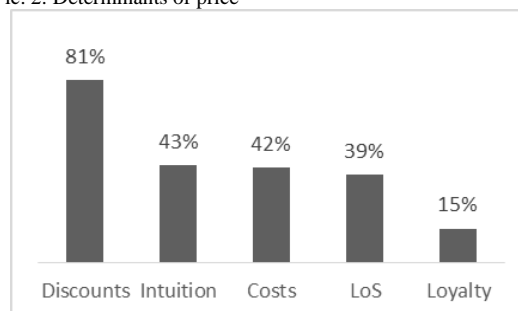
A total of 63 questions were divided into factual and identification questions. Substantive issues are further divided into eight sub-categories focusing on specific approaches. These are the following classifications: pricing instruments, quantitative instruments, distribution channels, prediction instruments, segmentation instruments, random instruments, competition analysis and general revenue management issues. Identification questions focus mainly on the type of accommodation, size, geographical location, or other specifics.

3 Results

The primary outputs are commented on based on the division of individual questions. First, a basic summary is given. The following section comments on more advanced approaches to evaluation by testing the hypotheses presented in the article's introduction.

The majority (68%) of accommodation establishments stated that they worked with the so-called dynamic pricing, claiming that they considered the competition's price to be the primary way of creating a dynamic price, from which they reflected their price level. Current occupancy has been identified as the second most common element that determines dynamic pricing. More than 30 % of respondents noted that they work with price dynamically and price elasticity is also the least used element when working with a dynamic price. When working with the price, it is also interesting to conclude about the essential tools that are used in creating prices (regardless of whether the accommodation facility works with a dynamic price). The summary is shown in the following picture 2.

Pic. 2: Determinants of price

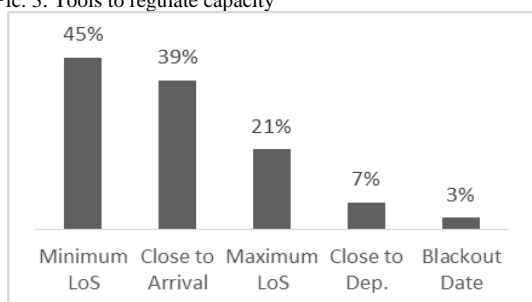


Source: own processing

The most crucial element that is reflected in the creation of prices was the provided discounts - according to the answers, 81% of respondents use them. The second most common element reflected in pricing is the intuition of the responsible person. An interesting fact is that only 43% of respondents work with costs when creating a price. Not even half of those accommodation facilities that work with costs regularly calculate fixed and variable costs. In the analysis of working with price, it was possible to argue that most accommodation facilities understand working with price as a dynamic process. However, it should be noted that many accommodation capacities do not use this approach's potential. Overall, working with the price can be considered less sophisticated and complex.

In working with quantity, it is evident that 63% of respondents regularly monitor occupancy. Overbooking is mentioned as the primary strategy when handling the capacities. 59% of respondents know and use this strategy. Accommodation establishments that do not use an overbooking strategy do not use it primarily for two reasons. The first reason is the riskiness of the strategy, and the second reason is the ignorance of the calculation of the recommended value of overcapacity reservations. In contrast, the strategy based on booking limits is relatively unknown and is used mainly by large accommodation capacities. Of the tools used to work with quantities, these are primary tools of the minimum length of stay and proximity of arrival, the so-called soft close or Close to Arrival. The tool that limits the maximum length of stay is then used the least. However, 31% of accommodation establishments stated that they did not use any capacity tool regularly. For more detailed information see pic. 3.

Pic. 3: Tools to regulate capacity



Source: Own processing

More than 80% of accommodation facilities stated that they were working with the expected occupancy or predicting the requested quantity. However, the majority (73%) use the naive prediction method. Only 18% of accommodation capacities work with the fact of events. Concerning price and accommodation capacity management, it is also necessary to set the correct sales targets. These targets are not set at all for 18% of respondents. If goals are set, then the goal is most often associated with achieving the planned occupancy. This works for more than 40% responders.

A more detailed evaluation of the fundamental research focused on five primary areas of questions, which were evaluated based on hypothesis testing. Testing was performed at a reliability level of $\alpha = 0.05$. The summary of the results commented below are presented in the following table 1.

Tab 1: Hypotheses testing

Test	P-value
dynamic price vs. size	0,00962
occupancy vs. size	0,03768
overbooking vs. size	0,68080
booking limits vs. type	0,77710
size vs. using RM	0,00645
type vs. using RM	0,01860

Source: own processing

The first part focused on the question of whether there is a statistically significant correlation between the rate of use of the

dynamic price and the size of the surveyed accommodation facilities. At a reliability level of $\alpha = 0.05$, it has been shown that there is a statistical relationship between the size of the accommodation and the rate of use of the dynamic price. The null hypothesis of the absence of a statistically significant correlation was rejected. As the size of the accommodation grows, so does the work along with the dynamic price. The second part focuses more on whether there is a relationship between the occupancy rate and the size of the accommodation. Thus, a reasonable hypothesis about the non-existence of such a relationship (built as a null hypothesis) was tested. Based on the Spearman's rho test, the null hypothesis favouring a significance level of $\alpha = 0.05$ was rejected in favour of the alternative hypothesis. Based on the positive value of the correlation coefficient, it turns out that with the growth of the size of the accommodation facility, occupancy (or its intensity in terms of regularity of monitoring) is worked on more often. On the contrary, such accommodation facilities, which have a small capacity, do not often monitor their occupancy. The third relationship tested focused on the issue of determining the value of the overbooking as a specific percentage of accommodation capacity concerning the size of the accommodation facility. Thus, the hypothesis of whether there is (or does not exist) a statistically significant relationship between the size of the percentage of offered accommodation capacities above capacity and the size of the accommodation facility is tested. The p-value reaches 0.6808, so the null hypothesis was not rejected. Thus, there was no statistically significant relationship between the overbooking level and the accommodation size. The fourth area focuses in more detail on the issue of using the so-called booking limits. An important question, which arose indirectly from the previous basic summary of the questionnaire survey, concerns the finding of a relationship between the accommodation type and the non-use of booking limits. In this case, the type of accommodation was evaluated. The null hypothesis was not rejected, and thus a statistically significant relationship between the type of accommodation facility and the non-use of the booking limits strategy was not demonstrated. It can therefore be argued that this strategy is not used similarly in all types of accommodation. The fifth relationship tested focuses on whether there is a relationship between the size and type of accommodation and the use of revenue management tools. Thus, two pairs of hypotheses (size and type of accommodation) were tested. The tests lead to a simple conclusion that a statistical dependence on the use of revenue management tools was demonstrated between the type and size of the accommodation facility, with the result that as the size and importance of the accommodation facility increases, so does the use of revenue management tools. Therefore, larger accommodation capacities work with these tools more often than smaller ones.

4 Conclusion

One of the main result from the presented research is that accommodation facilities are not uniform when in using revenue management. Based on the above, it can be concluded that revenue management is a well-known discipline but is still used by more extensive accommodation facilities. If we consider a group of tools working with a price and a group of tools working with a quantity as an essential pair of tools, it turns out that much more often, only work with the price is done and working with quantity is solved less often or not at all. It is true that even though working with a price is understood as working with a dynamic price, this price is often determined only based on the intuition of the responsible person. This element also encounters another fact that emerges from the questionnaire survey: the short work with price elasticity as a primary element usable in price optimization. Although the original logic of revenue management is based on booking limits, work with them is limited to a few accommodation capacities (all of which can be described as large hotels). Nevertheless, the size or type of accommodation is not related to the non-use of this strategy. In addition to booking limits, overbooking is a much better-known strategy, which is also a more widely used strategy. However, those accommodations that do not use it consider it too risky.

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Primary Paper Section: A**Secondary Paper Section: AH**