Ratio of the structure of hotel online booking channels and the monitoring of the quality of hotel websites in a multidimensional system : Identification and distribution of potentials

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RATIO OF THE STRUCTURE OF HOTEL ONLINE BOOKING CHANNELS AND THE MONITORING OF THE QUALITY OF HOTEL WEBSITES IN A MULTIDIMENSIONAL SYSTEM: IDENTIFICATION AND DISTRIBUTION OF POTENTIALS

Abstract

Purpose: The purpose of this paper is to explore the potentials that can positively impact the success of a hotel online business by: (1) exploring the specifics of the internal structure of online booking channels in the hotel business, (2) identifying the value and distribution of the potential to increase hotel bookings through the hotel website, (3) identifying the potential by exploring the space for improving hotel website excellence, and (4) developing an innovative multidimensional metric for monitoring hotel website quality.

Methodology: This research was approached in a way that the issue is considered from two aspects. Firstly, the potential to improve the ratio value of the hotel online booking channel structure is observed. The survey in the Republic of Croatia was conducted by regions on a sample of 4* and 5* hotels. Secondly, the potential to improve a hotel business is considered as the possibility to improve the performance of a hotel website.

Results: The research results show the value and distribution of the potential which can be used for a positive impact on the hotel business. Furthermore, the use of the presented multidimensional metric model allows a clear recognition of the potential for the hotel website quality improvement.

Conclusion: It can be concluded that both aspects of the potential research (in addition to the research findings), open up numerous possibilities for conducting similar or more complex analytical procedures and a new empirical research.

Keywords: Hotel, online booking channels ratio, potential, website quality, Google ranking factors, search engine visibility

1. Introduction

As a business entity, every hotel wants as many bookings as possible through a direct sales channel. Why is that? There are no intermediaries. There are no commissions. It is as simple as that. It is a well-known story that always presents a challenge for further research. But do hotels need, should they or do they want to work without intermediaries? With all the science and "heartbeat" from the real industry/market, it is best to try to increase direct bookings and leverage all the "good" that online travel agencies can contribute as intermediaries (Fei et al., 2017; Chang et al., 2019; Hoisington, 2021) and encourage direct hotel online sales (Cloudbeds, 2021). The tourism market is increasingly driven by the development of information and communication technology. The introduction of computer reservation systems (CRS) and global distribution systems (GDS), followed by the unfolding development of the Internet and online distribution channels, have dramatically changed the best operational and strategic practices in the industry (Buhalis & Law, 2008). Technological development very often opens new business opportunities and changes the existing business concepts. This is also emphasized by Webb (2016), when he points out that both sales policies and pricing policies of the hotel industry need to constantly change and adapt to new business conditions. O'Connor (2019) states similar ideas when analyzing the aspect of future development of online booking/sales channels in hospitality and tourism.

2. Theoretical and conceptual background/ framework

One of the main intentions of a hotel as a business system is to sell as many rooms as possible at the best possible price (Connally, 2021). Knowing (1) where potential guests look for information about the hotel, (2) how potential guests think, find or look for information (Šimunić, 2017), and (3) being visible in these/those places/channels is key to drive sales, especially through online booking channels, which is also confirmed by Beritelli & Schegg (2016). There are two main groups of booking/sales channels for accommodation businesses: (1) direct booking channels (no intermediaries - no commission), and (2) indirect booking channels (there are intermediaries - there are commissions). Direct booking channels can be divided into online booking channels (a brand website, email, an Internet booking engine, a mobile application, social media) and offline booking channels (phone, walk in, etc.). Indirect booking channels are both online and offline: OTAs - online travel agencies, GDS - global distribution systems, metasearch websites, tour operators, travel agents, group organizers etc. In what follows, the above booking/sales concepts are distinguished and their main characteristics and triggers are highlighted.

2.1 Hotel booking concepts

Direct online booking channels – a hotel website (via a channel manager, a PMS - property management system, a site booking engine), email, travel blogs, travel forum, social media, online ads, guest reviews, etc. The commission is 0%, but there is a significant investment in website improvement and optimization (not only money, but also knowledge, time, tracking trends, following the evolution of the Google algorithm, tracking the importance of the Google ranking factor, which is the most important factor for hotels, etc.).

Indirect online booking channels – this model is now the primary concept and source of hotel bookings. These include OTAs (online travel agencies), MSE (metasearch engines), and GDS (global distribution systems). Within this concept, the most dominant OTAs are Booking.com (with a commission rate of 15% and above), Expedia (with a commission rate of 15% and above), Airbnb (with a 3% host service fee and a 6-8% guest service fee), Agoda (with a 15% commission rate), Hostelworld.com (with a commission rate of 15%), Trip.com (with a commission rate of 20%), Laterooms.com (with a commission rate of 15%), Edreams.com (with a commission rate of 20%), etc. (Hotel Minder Team, 2021). The most famous MSEs are Trivago, Kayak, Skyscanner, TripAdvisor, and Google. A hotel pays a fixed amount of money to metasearch engines for each click, determined by a bidding system (or the PPC, "pay-per-click", model). The question is: Is it worth it? The hotel has to calculate and decide that for itself (Thielin, 2020). The main GDSs are Amadeus, Sabre, Galileo, and Worldspan (belongs to Travelport). Looking at GDSs from the hotel

perspective, it is worth highlighting that (1) hotels usually offer their rooms 30% cheaper on GDS (compared to public rates), (2) central reservation services (CRS), such as Sabre, allow hotels to offer their rooms on all GDSs at the same time, and (3) small independent hotels usually do not need a GDS (Thielin, 2020). It can be concluded that in this concept OTAs are now the most dominant hotel booking channel with a commission rate of about 15% to 20% for each booking. The numerical and monetary quantification of this percentage (in the context of the potential to be redirected to the development of the online direct booking channel through the hotel brand website) is the basis of the research and the principle of monitoring the stochastic and dynamic internal structure ratio of hotel online booking channels.

Direct offline booking channels – "back to the past". This channel was a reality before the Internet and de facto the most normal way to do business. But you can still benefit from some of the advantages and findings from those days when the best marketing model was the one where it was important to try to go beyond expectations and keep customers highly satisfied to ensure they come back to the hotel directly.

Indirect offline channels – "also a partial return to the past". These channels were a reality and de facto the most normal way of doing business before the advent of the Internet. They still exist in an offline environment, but have moved much of their activity into the online sphere.

In order to successfully deal with the distribution of hotel booking channels, hotels should constantly study (in detail and from different aspects) all costs and exploit the different potentials of all booking channels, which is confirmed by Huang et al. (2019). As Ye et al. (2017) point out, hotels need to analyze in detail all positive and negative aspects of booking channels and develop a strategy that ensures the maximum positive impact on business performance, what is also confirmed by Lei et al. (2019).

3. Methodology

In this paper, the focus is on exploring online hotel booking channels with the main objective of identifying and measuring the potential to improve hotel business performance. In this context, two main aspects are analyzed: (1) the potential space for optimizing the internal distribution structure of online hotel booking channels in order to increase the share of direct online bookings in relation to indirect bookings through intermediaries (segmentation - country, destination level, local new, hotel groups or hotels), and (2) the potential space for improving the excellence of hotel website performance (Šimunić, 2020). The aim of the research is to obtain a clear and segmented picture of the spatial distribution of the potential for improving performance indicators in the hotel business. By considering the distribution of online booking channels as a stochastic and dynamic process, this paper will: (1) consider the trends and compare the characteristics of online booking channels in the hotel business, which Steinhauser & Bohne (2018) have already written about, (2) highlight the importance of the internal structure of online booking channels in the hotel industry, which has already been dealt with by Law et al. (2015) and Martin-Fuentes & Mellinas (2018), (3) highlight the value and distribution of the potential for a direct positive impact on hotel business performance, (4) emphasize the importance of knowing how the Google algorithm works for achieving a better position/visibility within search engine result pages, and (5) define the direction of metrics development (present a multidimensional model for website quality analysis and monitoring) to measure the potential for website quality improvement. In this context, the hypotheses of the paper are stated below.

3.1 Hypotheses

The following hypotheses are supplementary to the preceding part of this paper:

(H1) - Globally, worldwide and in Europe, the internal structural relationship of online hotel booking channels is significantly dominated by OTAs as the booking channel.

(H2) - In the Republic of Croatia (RH), the internal structure of hotel online booking channels is significantly dominated by OTAs as a hotel booking channel.

(H3) - Measuring the distribution of the potential to improve direct sales through the hotel brand website, which results from the internal structure of online hotel booking channels and manifests itself through the payment of commissions to online travel agencies, provides a precise, segmented insight into the value of the potential. At the same time, it provides the basis for (1) innovation in business policies and strategies, and (2) an integrated market presence and better destination management.

(H4) - Knowing how the Google algorithm works and how important Google ranking factors are as elements of a website, continuous measurement and monitoring of hotel website quality by using multidimensional metric models to measure the potential for improving website performance excellence ensures a more consistent, high-quality, and complex insight into the quality of hotel websites and improves the quality of the hotel website optimization process.

4. Basics, assumptions and research results

At the beginning of the research, the author reviews previous research and the relevant literature to determine the factual situation in the world, Europe and the Republic of Croatia. With the accelerated development of technology in the last 10 - 15 years (which is increasingly working on the transformation of all business sectors into the online environment), the focus is also on the trend (Feinstein, 2018) in the research of online hotel booking channels. The facts and data that had the most dominant and relevant effect for gaining new knowledge and important parameters about the distribution of online hotel booking channels were observed from the macro and micro aspect (the macro aspect: world/ Europe, the micro aspect: the Republic of Croatia).

4.1 Macro aspect

According to Prieto (2018), looking at the macro aspect depending on the region, the shares of OTAs and direct bookings in the structure of online hotel distribution booking channels in 2017 were as follows:

Table 1 Macro aspect – share of hotel online bookings through OTAs and hotel websites

Region of the world	Share of hotel online booking channels	
	OTAs	Hotel direct bookings
USA	50 %	50 %
EUROPE	**69 %**	**31 %**
LATAM (Latin America)	69 %	31 %
APAC (Asia Pacific)	72 %	28 %

Source: Edited by the author according to Prieto (2018) – [Statistics source: Phocuswright – phocuswright.com]

Depending on the region, OTAs account for between 50% and 72% of online hotel bookings.

In addition, D-EDGE Hospitality Solutions published statistics on The Rise of Direct Bookings over OTAs: Hotel distribution trends in EMEA and APAC (D-EDGE Hospitality Solutions, 2021) and presented the results of an empirical study conducted from 2017 to 2020. Due to the COVID 19 pandemic that took place during the study, 2020 is divided into 3 phases, where [P1 Phase 1] covers the period from January to February, i.e. before the pandemic, [P2 Phase 2] covers the period from March to May, corresponding to the first wave of global closure, [P3 Phase 3] covers the period from June to September, i.e. the phase of uncertain reopenings and cautious recovery. The purpose of the research was to understand what happens with the penetration of online booking channels in the hotel industry and to identify trends (Table 2).

Table 2 Website market share: the evolution of a combined OTA market share and a comparison of a website direct market share in Europe from 2017 to 2020

	Online booking channel	Values by years (in %)					Change (percentage points)
		2017	2018	2019	Avg. 2020		2017-2020
Website market share (%) : Comparison in % of realized revenues according to online booking distribution channels in Europe	**[a]** Web direct	**18.3**	**19.3**	**20.7**	[P1] 27 [P2] 32 [P3] 28	**28.4**	**+10.1**
	[b] Booking Group	51.8	48.2	45.5	[P1] 42 [P2] 45 [P3] 53	48.0	- 3.8
	[c] Expedia Group	17.0	18.5	18.7	[P1] 15 [P2] 10 [P3] 7	10.4	- 6.6
	[d] Other OTAs	4.3	4,5	4.8	-	4.9	+ 0.6
	Σ [b+c+d] - OTAs	**73.1**	**71.2**	**69**		**63.3**	- 9.8
Online Σ	**Σ** [a+b+c+d] - olDC	91.4	90.5	89.7		91.7	+0.3

Source: Edited by the author according to D-EDGE Hospitality Solutions (2021)

The following table presents a more complete insight into data on reservation revenue as a market share percentage by distribution channels in comparison to the EMEA and APAC regions.

Table 3 Hotel booking channel market share distribution (percentage of booking revenue after cancelation by channels: Europe and Asia Pacific [EMEA, APAC])

Channel	Region	2017 (%)	2018 (%)	2019 (%)	2020 (%)	Change + / -
Booking Group	EMEA	**51.8**	**48.2**	**45.5**	**48.0**	**– 3.8**
	APAC	32.4	40.2	38.5	35.9	+ 3.5
Website direct	EMEA	**18.3**	**19.3**	**20.7**	**28.4**	**+ 10.1**
	APAC	23.9	26.8	28.1	35.8	+ 11.9
Expedia Group	EMEA	17.0	18.5	18.7	10.4	– 6.6
	APAC	15.8	16.2	15.9	9.1	– 6.7
Wholesalers	EMEA	5.5	5.9	5.8	4.4	– 1.1
	APAC	2.7	3.7	2.9	2.1	– 0.6
Other OTAs	EMEA	**4.3**	**4.5**	**4.8**	**4.9**	+ 0.6
	APAC	2.6	10.8	12.1	15.6	– 8.0
Other sources	EMEA	3.2	3.7	4.3	4.0	+ 0.8
	APAC	1.6	2.4	2.5	1.5	– 0.1

Notes: (1) EMEA – Europe, Middle East and Africa, (2) APAC – Asia, Pacific.
Source: Edited by the author according to D-EDGE Hospitality Solutions (2021)

Hypothesis (H1): Based on the presented data (Table 1, Table 2, Table 3), it can be concluded that at the levels of the world and Europe, the sale/booking of hotel facilities through online travel agencies dominates in the internal structure of hotel booking channels (with an average value of about 70%). Based on these facts, hypothesis 1 is fully accepted and proven.

4.2 Micro aspect

In the following, from the micro aspect, the issue of recognizing and distributing the potential for further booking improvement through a hotel direct online booking channel (website) at the level of the Republic of Croatia is discussed (Vukasović & Mihač, 2021). For a better insight, the data is compared with data relevant to Europe and the world.

4.2.1 *Distribution of hotel online booking channels in the Republic of Croatia*

This part of the author's empirical research (a micro aspect) is also based on the data analysis of the internal structure of hotel booking channels in Croatia (Benchmark FMTU, 2020; Mihač, 2019; PHOBS Central Reservation System, 2020).

Table 4 Share of online bookings by channels

Distribution of hotel online booking channels	
Booking channel	**Share (%)**
Brand website	**19.23 %**
OTA	**66.72 %**
B2B module	1.35 %
Distribution channels (metasearch, etc.)	0.74 %
GDS	0.1 %
RezApp	11.86 %

Source: Edited by the author according to (1) PHOBS CRS, (2) Mihač, 2019, and (3) Benchmark FMTU, 2021

The following table shows the sample structure and data on the distribution of online booking channels for 2019. The data refers to 5* hotels in the Republic of Croatia.

Table 5 Hotel online booking channels: structure sample and distribution (5* hotels in the Republic of Croatia)

Sample structure in relation to hotels in the Republic of Croatia			Sample structure in relation to 5* hotels in the Republic of Croatia			Distribution of online booking channels of the observed sample	
Σ Hotels in RH	**Number of hotels in the sample**	**%**	**Σ Hotels with 5* in RH**	**Number of hotels in the sample**	**%**	**Hotel brand website**	**Online travel agencies (OTAs)**
737	41	5.56%	47	41	87.23%	**22.1 %**	**65.4 %**

Source: Edited by the author according to (1) PHOBS CRS, and (2) the Ministry of Tourism and Sports of RH

In order to identify and measure the potential for improving the structure and distribution of the online hotel booking channel, the following data show the business performance of hotels (key performance indicators) for the Republic of Croatia compared with the data for Europe and the world (Table 6).

Table 6 Hotel key performance indicators for 2019: Comparison of the Republic of Croatia with the situation in Europe and the world

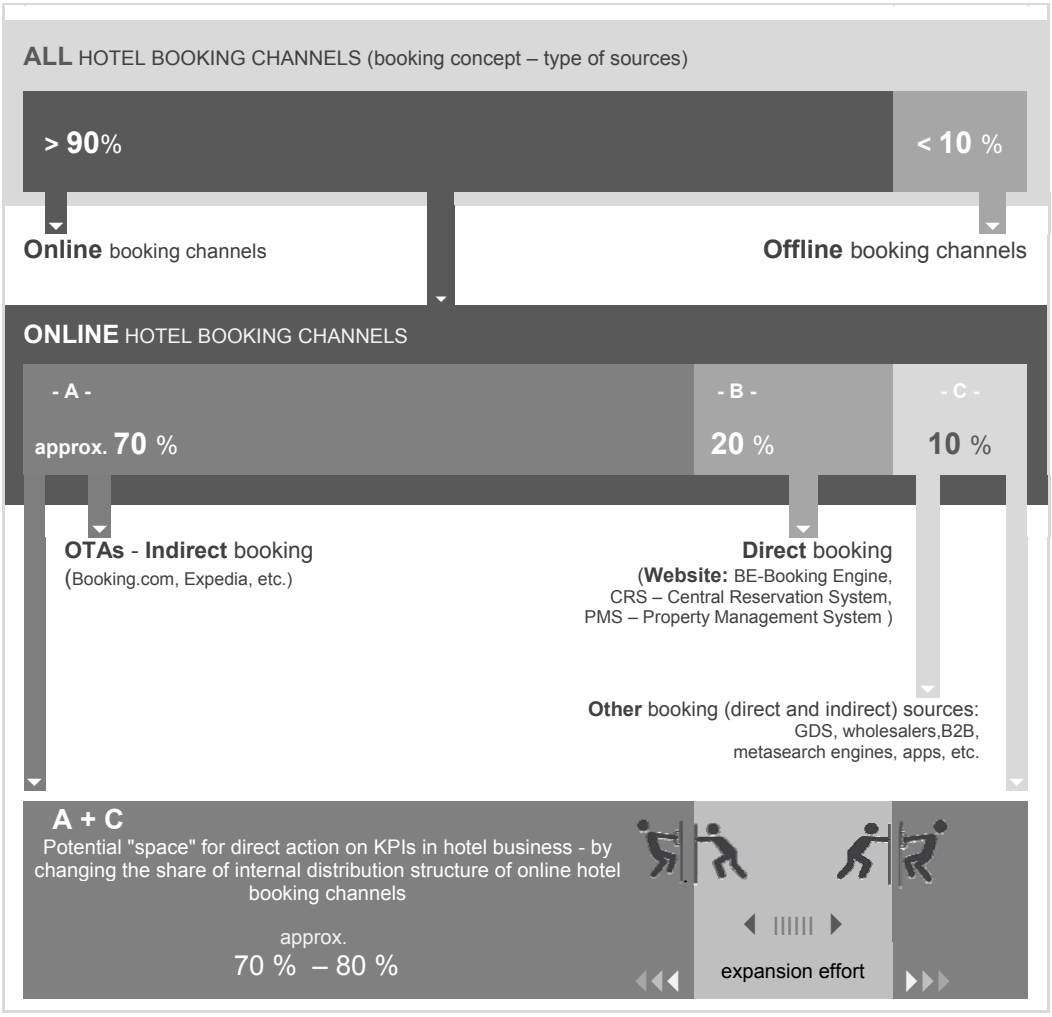
Hotels	Average occupancy (full capacity %)	ADR	RevPAR	TrevPAR	Total revenue per overnight
Croatia Avg.	**52.91**	**93.44**	**52.21**	**78.47**	**79.77**
5* Hotels in RH	**60.50**	**154.62**	**87.72**	**131.08**	**127.75**
4* Hotels in RH	**53.97**	**86.21**	**50.21**	**76.93**	**75.56**
Europe	**72.00**	**129.7**	**93.71**	-	-
World [2]	**67.85**	**122.44**	**82.9**	-	-

Notes: (1) Data for the RH & Europe in EUR, data for the world in USD, (2) Data for the world – average (Asia Pacific, Americas, Europe Middle East/Africa 94.69), (3) Avg. occ. – Average occupancy rate, (4) ADR – average daily rate, (5) RevPAR – revenue per available room, (6) TrevPAR – total revenue per available room.
Source: Edited by the author according to (1) the Croatian Hotel Industry Benchmarking, and (2) Statista, 2021

Hypothesis (H2): Based on this part of the research and the presented data (Table 4, Table 5 and Table 6), it can be seen that hotel capacity bookings through OTAs (online travel agencies) are dominant in the Republic of Croatia (about 65%). These facts prove hypothesis 2 of this paper.

The following figure shows the distribution of the total hotel booking channel by source type (booking concept - source type).

Figure 1 Booking channel distribution concepts (source type) – Internal structure



Source: Author

In general, it should be stressed that of the total number of bookings in the online environment, about 70% are made by OTAs, about 20% by direct bookings (mostly referring to the website) and the remaining 10% by other booking channels. This range (70% - 80%) indicates that there is potential for action in relation to booking strategies to improve hotel performance. The following two tables (Table 7 and Table 8) show the calculation of the hotel business potential value and distribution.

Table 7 Overview of real hotel booking market size as a potential to improve the distribution structure of online booking channels in the hotel business (2019 by region)

	Avg. occ. %	ADR	NoH	TNoR	Σ ARMV	Online hbMV 90%	Offline hbMV 10%
	a	b	c	d	e = a*b*d*365	f = 90% of e	g = 10% of e
World	67.85	122.44	700,000[1]	16,970,000	514,194,848,796.00	462,775,363,916.40	51,419,484,879.60
Europe	72.20	129.7	146,616[3]	6,845,604	233,333,507,636.64	210,000,156,872.98	23,333,350,763.66
Σ Croatia	52.91	93.44	737	60,414	1,090,187,120.61	981,168,408.54	109,018,712.06
5* Hotels RH	60.50	154.62	47	6,322 (10.5% of Σ)	215,858,124.60 (19,8% of Σ)	194,272,312.14	21,585,812.46
4* Hotels RH	53.97	86.21	337	30,633 (50.71% of Σ)	520,226,484.94 (47,7% of Σ)	468,203,836.44	52,022,648.49
RH Istria	51.67	92.42	51	8,764	152,756,485.91	137,480,837.32	15,275,648.59
RH Kvarner	43.00	84.71	89	7,194	95,645,916.99	86,081,325.29	9,564,591.70
RH Continent	70.58	68.92	63	4,268	75,778,184.82	68,200,366.33	7,577,818.48
RH Dalmatia	54.27	113.98	181	16,729	377,703,770.12	339,933,393.10	37,770,377.01

Notes: (1) Data in EUR (data for the USA in USD), (2) Avg. occ. - Average occupancy rate, (3) ADR - Average daily rate, (4) NoH - Number of hotels, (5) TNoR - Total number of rooms, (6) ARMV - Actual realized market value, (7) Online hbMV - Real value of online hotel booking channel market size, (8) Offline hbMV - Real value of offline hotel booking channels market size.
Source: Edited by the author according to (1) Statista (2021), (2) Chappell (2021), (3) Lock (2020), (4) the Croatian Hotel Industry Benchmarking project FMTU 2021, (5) Mihač (2019), (6) the Ministry of Tourism and Sports of RH

The data shown in Table 8 are derived from Table 7.

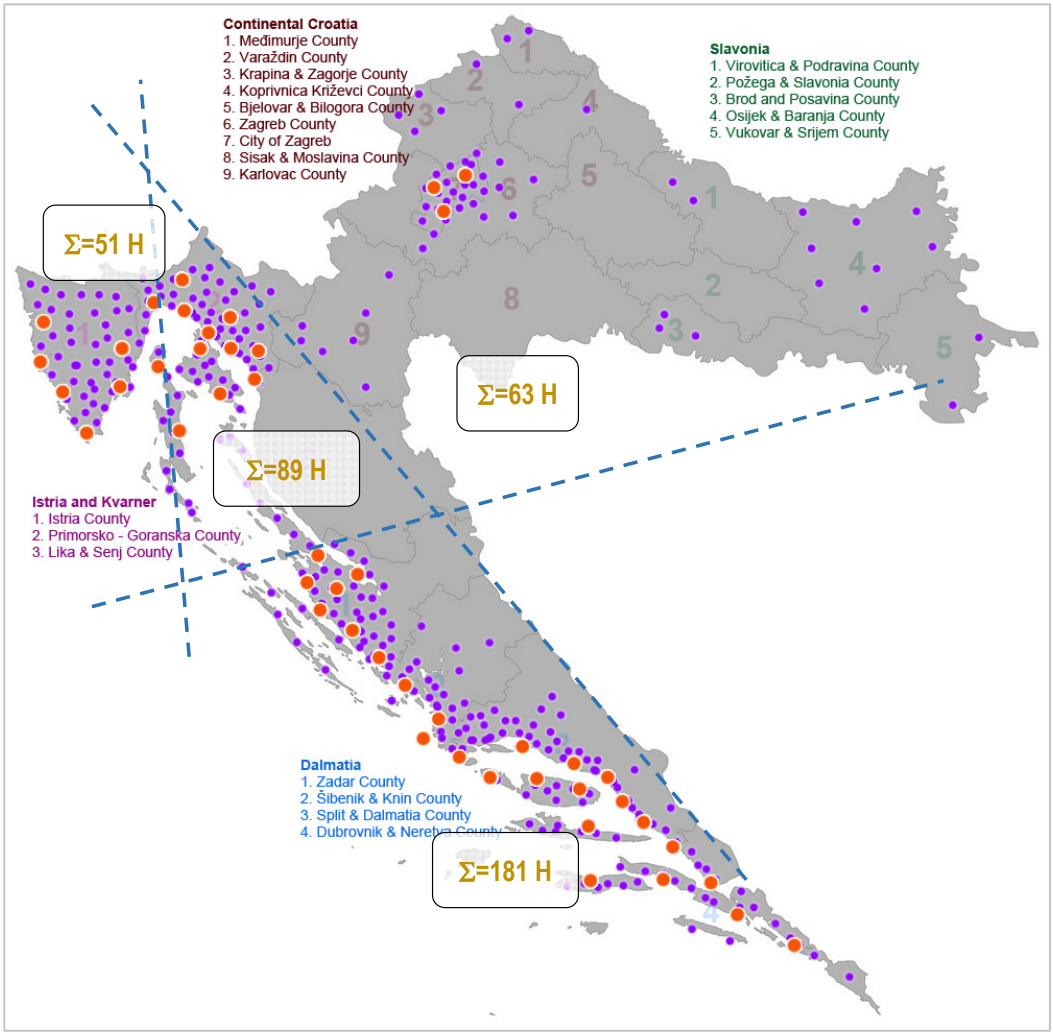
Table 8 Distribution of the online booking potential value according to booking channels for 2019 (based on the 70/20/10 booking channels ratio)

Potential according to online booking channels and OTA commission paid					
Region	**Online hbMV** (90%)	**Distribution of online booking channels**			**COMM O**
		IOn hbMV booking (70%)	**DOn hbMV booking** (20%)	**OOnCDI** (10%)	
	a	b = 70% of a	c = 20% of a	d = 10 % of a	e = 15% of b
World	462,775,363,916.40	323,942,754,741.48	92,555,072,783.28	46,277,536,391.64	48,591,413,211.22
Europe	210,000,156,872.98	147,000,109,811.09	42,000,031,374.60	21,000,015,687.30	22,050,016,471.66
CROATIA	981,168,408.54	686,817,885.98	196,233,681.71	98,116,840.85	103,022,682.90
5* Hotels - RH	194,272,312.14	135,990,618.50	38,854,462.43	19,427,231.21	20,398,592.77
4* Hotels - RH	468,203,836.44	327,742,685.51	93,640,767.29	46,820,383.64	49,161,402.83
RH - Istria	137,480,837.32	96,236,586.12	27,496,167.46	13,748,083.73	14,435,487.92
RH -Kvarner	86,081,325.29	60,256,927.70	17,216,265.06	8,608,132.53	9,038,539.16
RH - Continent	68,200,366.33	47,740,256.43	13,640,073.27	6,820,036.63	7,161,038.46
RH -Dalmatia	339,933,393.10	237,953,375.17	67,986,678.62	33,993,339.31	35,693,006.28

Notes: (1) Data for the world in USD, other in EUR, (2) Online hbMV – Online hotel booking channel market value, (3) IOn hbMV – Indirect online hotel booking channel market value, (4) DOn hbMV – Direct online hotel booking channel market value, (5) OOnCDI – Other online direct and indirect booking channel market value, (6) COMM O – Commission paid to OTAs: Potential for the restructuring of hotel booking channel distribution.
Source: Author

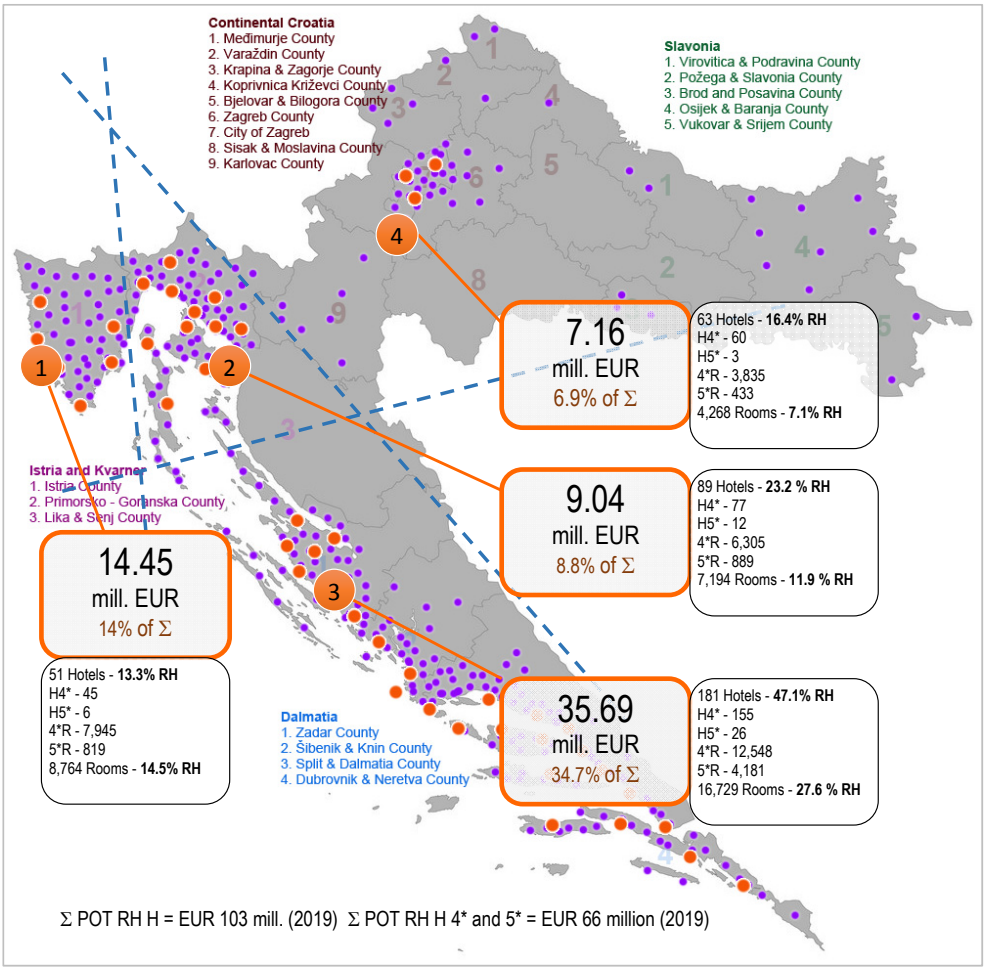
The data shows that the total value of commissions paid to online travel agencies worldwide was about USD 48.5 billion (about EUR 39 billion) in 2019. Europe accounted for about EUR 22 billion of the said amount. In 2019, the Republic of Croatia paid EUR 103 million in commissions to OTAs. For this paper, an empirical study was conducted on a sample of 4* and 5* hotels in the Republic of Croatia. The following two figures clearly show (1) the distribution of 4* and 5* hotels in the Republic of Croatia by region (Figure 2), and (2) the identification and distribution of the potential for action/investment of funds for correcting the structural ratio of hotel online booking channels in favor of the website as the most important online direct booking channel (based on commissions paid to online travel agencies) (Figure 3).

Figure 2 Spatial distribution of 4* and 5* hotels in the Republic of Croatia



Source: Author

Figure 3 Overview of total potential distribution (commissions paid to OTAs) by region of the Republic of Croatia



Notes: Calculation of the potential based on 4* and 5* hotels in the Republic of Croatia.
POT – Potential
Source: Author

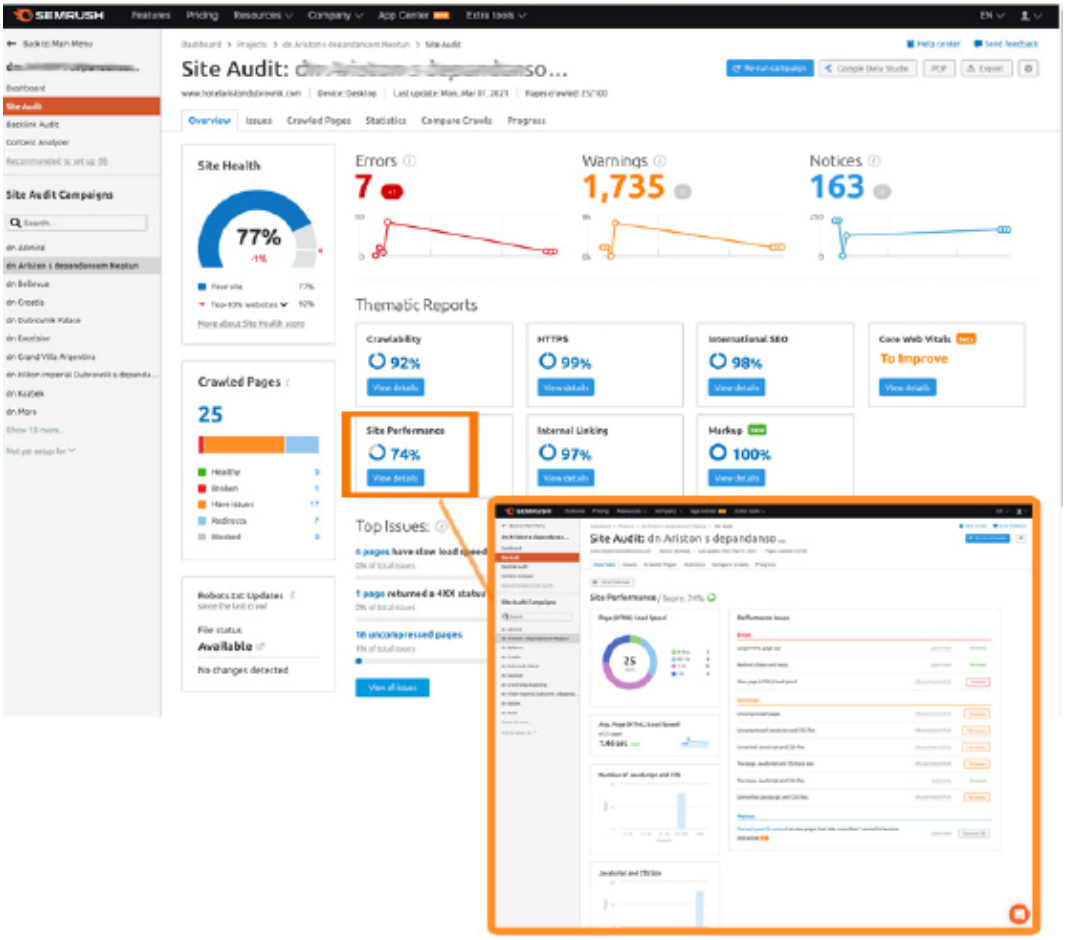
Hypothesis - (H3): Based on the data given in the previous graphs, there is a clear overview of the distribution of the potential to improve direct online sales through hotel websites (resulting from the payment of commissions to OTAs). It can be seen that this approach to capacity development (which can monitor the distribution of the potential in the state, region/destination, a hotel, a group of hotels, etc.) certainly provides a better basis for (1) the innovation of the hotel business policies/strategies, (2) the integrated performance in the supply market, and (3) better destination management, which also proves hypothesis 3 of this paper.

4.2.2 Hotel website and search engine visibility

The hotel brand website is the most valuable booking channel for a hotel. Each hotel website has its own qualitative value determined by Google algorithms based on the quality of Google ranking factors (Robinson, 2019). These factors are either directly or indirectly related to the website. It is important to optimize as many factors as possible and

constantly monitor them with appropriate metrics. Kakkar (2015) writes about this topic, explains Google algorithms and focuses on website optimization processes. The value of the website is crucial in the context of search engine visibility, which is addressed by Shaolong et al. (2019) and Pan (2015), who emphasize the importance of search engine visibility, especially in tourism. Nowadays, there are many professional software packages that help to improve online visibility and discover many different marketing insights such as Semrush, Ahrefs, Google Search Console, SpyFu, Screaming Frog, etc.). The author uses Semrush Software as a Service all in one tool (a guru license) for the needs of this research. Software like Semrush allows users to analyze the quality of websites by measuring a large number of different variables (site performance, crawlability, SEO, linking, etc.). Such tools help hotels as business entities to improve their work by means of search engine optimization. Its main advantage lies in a detailed analysis and presentation of a large number of different parameters, but according to the observed business unit/website. Each analysis process consists of a number of subprocesses that perform analyses according to a variety of different criteria (see an example in Figure 4).

Figure 4 Semrush site audit analysis and site performance subanalysis



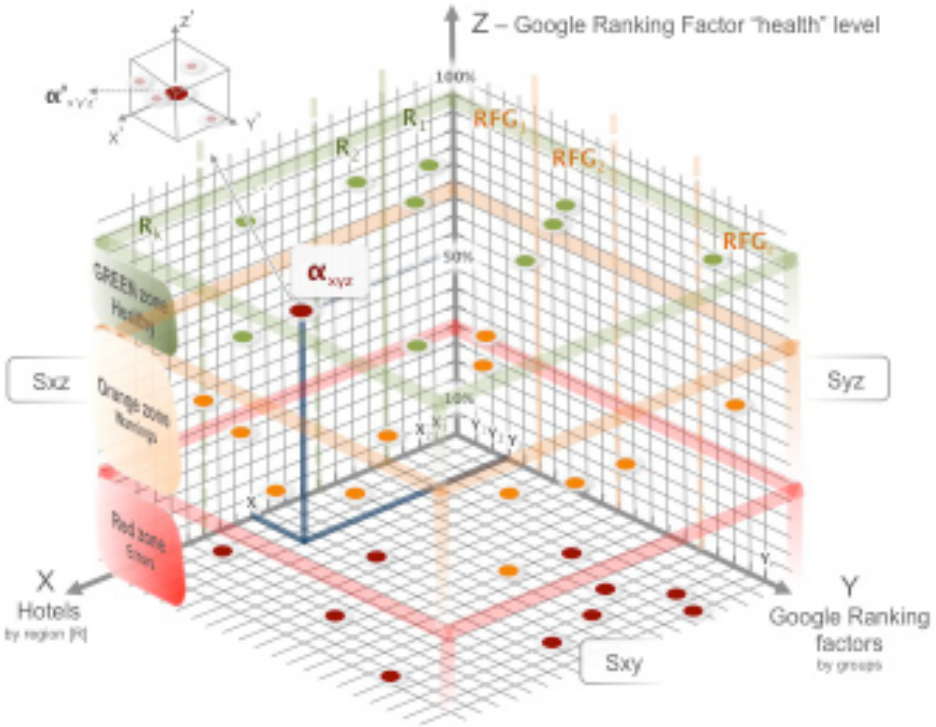
Source: Author

By summarizing all facts, conclusions and aspects mentioned so far, there is a complementary conceptual model of metrics for measuring and analyzing the quality of hotel websites (individually, segmented according to various criteria, etc.) in a multidimensional system.

4.2.3 *Multidimensional website quality metric model – MDWSQmm*

The multidimensional metric model presented in this section is based on observing the evolution, quality and impact of the Google algorithm ranking factor on visibility within the search engine, which Barysevich (2020) writes about and highlights the Page Experience Update as the biggest Google update of the year. The Google algorithm has over 200 factors categorized into corresponding groups (Domain Factors, Page-Level Factors, Site-Level Factors, Backlink Factors, etc.) (Brian, 2020). The Google search engine algorithm factors are stochastic and dynamic. This means that their individual value can change several times a day, always according to an unpredictable scenario. However, one thing is for sure: optimizing more factors provides better visibility in search engines. This should be the intention of every hotel as a business system. The following figure simply shows a conceptual multidimensional metric model for tracking, displaying and analyzing the quality level of Google ranking factors as elements of a website. The results obtained by the above-mentioned specialized software for a complex, in-depth analysis of the state of the website are entered into a database, from which they are transferred (for the purpose of further monitoring and analysis) to the presented multidimensional system.

Figure 5 MDWSQmm - A multidimensional metric model for monitoring and analyzing the quality of the Google ranking factor as an integral part of a hotel website



Notes: x - hotels, y - Google Ranking Factors, z - Google ranking factor health audit value, Sxy - a set of points in the xy plane, Sxz - a set of points in the xz plane, Szy - a set of points in the zy plane, RFG - Google Ranking Factors group, region/destination - Google factor, α_{xyz} - qualitative characteristics of the hotel website ("health" level of the specific website element/Google ranking factor).
Source: Author

Within the framework of the presented multidimensional metric model, qualitative zones (green, orange and red) can be observed in the planes (xy, xz, yz) of the system (S). The concentration of points in a given zone is a qualitative representation of the observed variables (e.g., an individual hotel, a group of hotels, destinations, groups of Google ranking factors, etc.). In the presented multidimensional system, the following organized data sets are observed, which can be used in many different (simple and complex) analyses.

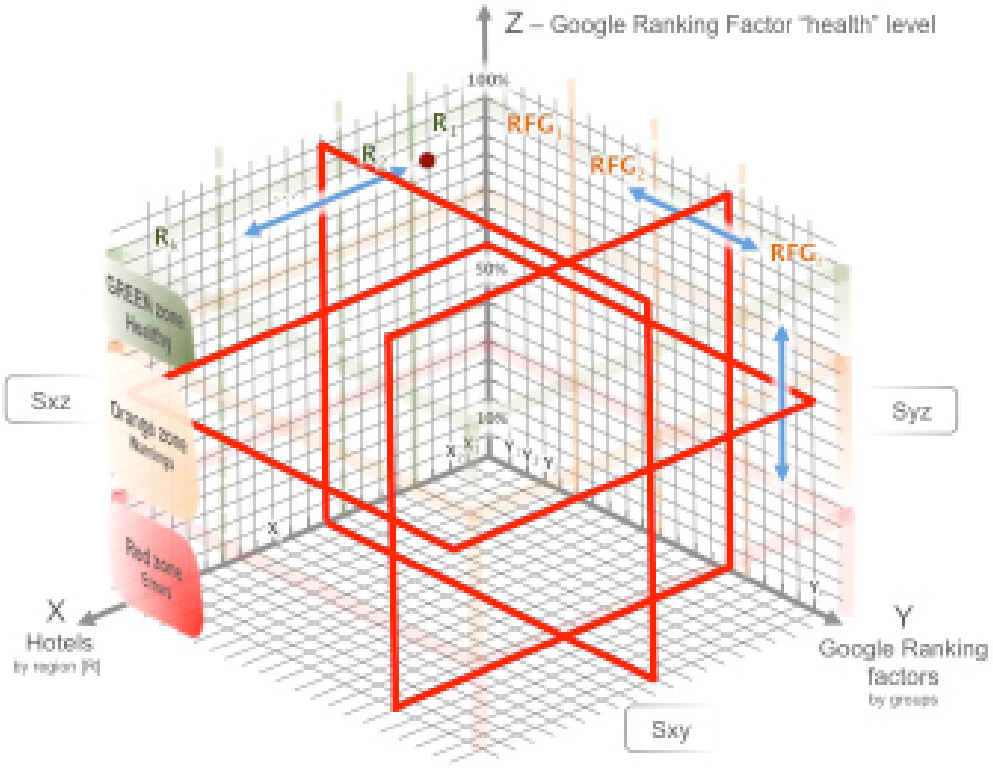
4.2.3.1 Set S – a set of points of a multidimensional system (MDWSQmm model)

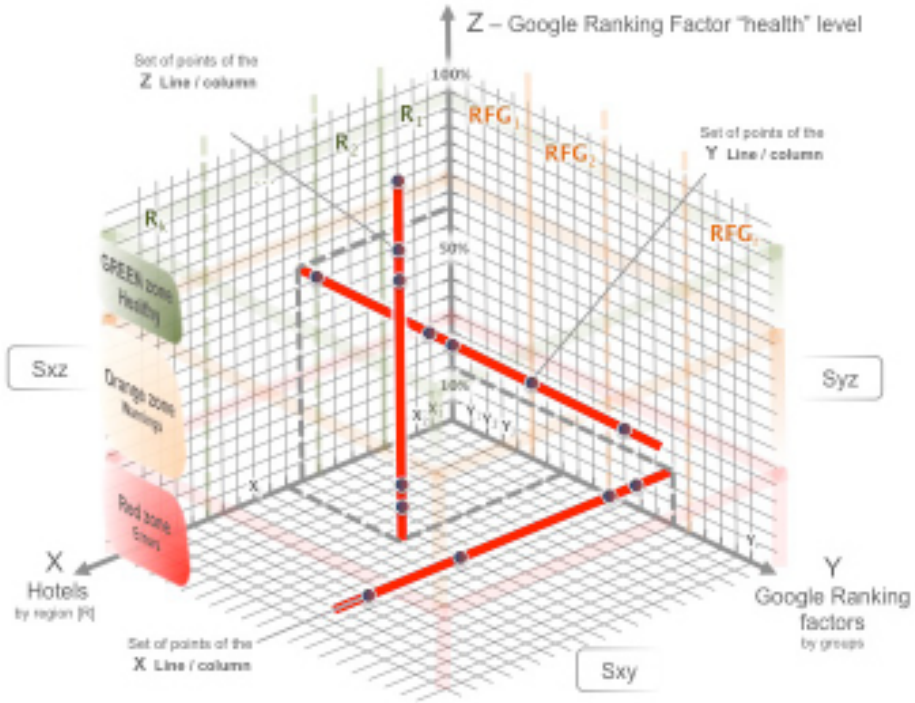
The presented MDWSQmm model allows an unlimited number of different simulations and analyses by simply inputting or dropping variables into or from the represented system. The set S represents all points of the multidimensional system (in this case, these are the characteristics of all observed hotels and all observed Google ranking factors by qualitative values defined by points α_{xyz} of the xyz prism and the expression $S = \{\alpha_{xyz}\}$, where x = 1, 2, 3, ..., m, y = 1, 2, 3, ..., n and z = 1, 2, 3,... r, 100%.

4.2.3.2 Planes of a multidimensional system (MDWSQmm model)

The multidimensional system of metrics presented below is presented by individual planes and columns/line/pillars.

Figure 6 MDWSQmm - Characteristic planes and columns/pillars of a multidimensional metric model for monitoring and analyzing the quality of Google ranking factors as elements of websites





Source: Author

The presented MDWSQmm model is based on the knowledge of the Google algorithm and Google ranking factors as elements of the website, whose quality should be constantly monitored, evaluated and optimized (without their knowledge and analysis, it is not possible to enter values into the presented MDWSQmm as a system). The proposed multidimensional system of monitoring and presenting website quality metrics according to different criteria and variables allows us to monitor individual qualitative characteristics of the hotel website (α_{xyz}) through individual and group analyses of individual characteristics by the presented levels or columns of the system. Moreover, if necessary, the model can be further expanded by developing new multidimensional systems as subsystems of the presented system/points as system features ($\alpha'_{x'y'z'}$).

Hypothesis - (H4): This confirms hypotheses 4 and 5 that the use of multidimensional metric models such as MDmWSQm for the analysis and quality monitoring provides an additional and complementary value to existing specialized software for website analysis and optimization. The use of the MDMMS model provides a more consistent, high-quality and complex insight into the quality state of hotel websites and improves the quality level of the hotel website optimization process.

5. Conclusion

Every hotel wants to sell as much of its accommodation capacity as possible through direct distribution channels. Today, more than 90% of accommodation capacity is sold/booked through hotel online booking channels. Of this figure (i.e. 90%), on average, between 70% and 80% of accommodation capacity is booked through OTAs, which charge a commission for their services (approximately 15-20%). In this paper, the commission paid to OTAs is specifically studied and considered as a potential for hotels to redirect part of these funds to website development, in favor of implementing new technologies, exploring new business models and business policies at all levels (a hotel, a hotel group, a region/a destination, a country). To improve success in a hotel business, the ratio between the realized ratio of online

bookings through OTAs and the hotel brand website should be changed in favor of the hotel brand website. Empirical research shows how large this online booking potential (OTA payments) is at all observed levels. Achieving a better balance between third-party bookings such as OTAs and direct bookings can help modern hoteliers to improve their key performance indicators, maximize revenue, and take full advantage of projected market growth. At the same time, this paper focuses on exploring the potential of how to improve the performance of the hotel website, which is the most profitable channel for online hotel booking. The paper presents an innovative model for analyzing and monitoring website quality (MDmWSQm model), which enables the performance of various metric processes by representing and analyzing data in a multidimensional system. Through individual planes and columns of the multidimensional system, it is possible to qualitatively look at a large number of different variables (Google ranking factors as qualitative elements of the hotel website) simultaneously in order to identify room for improving the performance of the hotel website. Simultaneous recognition and exploitation of the potential arising from (1) the internal structure of hotel online booking channels, and (2) room for improving the quality of individual elements (or groups of elements) of the hotel website as google ranking factors will certainly elevate a hotel business to a higher level.

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