

## THE READINESS FOR IMPLEMENTING ICTs IN HOTEL INDUSTRY ORGANIZATIONS: EVIDENCE FROM THE REGIONAL LEVEL

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<https://doi.org/10.20867/tosee.07.24>

### **Abstract**

*Purpose* – Information and communication technologies (ICTs) usage is one of the key elements in the competitive struggle and achieving a competitive advantage in the hotel industry. The main goal of this paper is to empirically analyse the existence of readiness to implement ICTs in a sight of the potential challenges which hotels face due to the lack of such technology in their business.

*Methodology* – This article, through researching the attitudes of managers at the top, middle and operational management levels, analyses the readiness of the organizations in hotel industry to implement ICTs as well as the main opportunities and advantages of their application. The data were analysed by acting the methods of descriptive and inferential statistics in order to test the significance of the examination attitudes obtained from respondent.

*Findings* – The obtained results indicate the importance of the readiness for companies in the hotel industry to apply ICT and the inclination for digital transformation of business. There is exigency to provide an insight into the state of readiness for the implementation of digital technologies in the hotel industry, as well as a proposal for the values that these actions result.

*Contribution* – The main contributions of this paper are fulfilling the literature gap towards the mentioned research issue for the implementation of ICT in the hotel industry at the regional level and providing insight from the viewpoints of managers rather than from technology experts.

**Keywords:** Information and communication technology, readiness, hotel industry, digital implementation.

### **INTRODUCTION**

The transformation of the hotel and hospitality industry in recent years is the cause of the dynamic trend of ICTs application in terms of the progress of all components of the organization, starting from business processes, through the strategy and structure of human resources. ICTs benefits everyone in the business system as well as in the environment. Therefore, guests can search for and purchase customized hotel services more efficiently, while it enables suppliers to manage and develop product distribution without space and time constraints by using effective digital tools (Buhalis and Law 2008; Yorkulov et al. 2022). Specifically, in the case of potential technological implementation in hotel organizations, it is important to distinguish that the term "ICTs" comprehensively connects several types of technology that in some way transform hotel operations. Given that the tourism and hospitality sector was most strongly affected by the Covid-19 pandemic, such a scenario showed the necessity of the digital transformation process in that sector. As much as ICTs is present in the service sector today, the huge potential that digital technologies possess reflects their insufficient

utilization. Since technologies enable efficient communication all over the world, at the same time faster information transfer is achieved, which has helped the hotel industry in the form of better interaction with clients, more reservations, better placement of products on the market (Verhoef et al. 2021). The ICT advantages provides to the hotel industry are great, viewed from the aspect of using the Internet, the costs are low, which allows everyone to use it for any purpose, such as: obtaining information, training on the web, buying products, helping with orientation and the like.

In the previous consideration of the introduction of this research, we touched on the tourist market, which refers to the hotel product. But what about employees, what is their role when we talk about new technologies and the dynamics of digital transformation? The workforce is a very important component of hotel management. A growing problem in any sector, including the service sector, is the inconsistent structure of the workforce. This refers to the staffing of work resources that do not contribute in the right way to the expected performance on the job (Hagiu and Wright, 2019; Limna et al. 2022). Some of the possible effects of such results stem from insufficient skills of employees when performing business tasks related to ICTs, failure to achieve a sufficient level of education on the part of hotel management in digital tools, but also due to the existence of a gap in the labor market. From the aspect of demand for accommodation, technology has made it possible for potential users of hotel services, based on their budget and free time, to more easily research the locations of destinations, accommodation units, transport options and thus make more efficient decisions about travel and consumption of services (Verhoef et al. 2021; Gruescu et al. 2009; Wei 2016). This research aims to show the degree of readiness of hotel organizations for the implementation of ICT.

The goals of this research are to examine the existence of readiness in hotel organizations to implement ICTs. If there is a tendency of the hotel to adopt these technologies, to what extent does this implementation tend to be realized? In which aspects of the hotel organization would ICTs have the best effect for progressing business system? These are some questions to be answered in the research and based on them, hypotheses were set in next paragraph. Firstly, a motive for carrying out this research resides in certain recommendations for future research of relevant scientific articles written on a similar topic. On the basis of these articles, suggestions are identified in which direction future research should pay attention and where they have a strong potential for contributions. Furthermore, the created survey questionnaire is subtracted on statements that have proven to be trusty and important when examining the attitudes of hotel managers about the readiness for the application of ICTs. Considering that the term ICTs represent a collective spectre of digital tools, resources and algorithms for more efficient and innovative implementation of information system transactions, in this research digital technologies related to today's more modern technologies such as Big data systems, virtual (VR) and augmented reality (AR), artificial intelligence (AI) robotic systems and the Internet of Things (IoT) (Spremić 2017).

In addition, the framework for researching is appointed considering the vital components of hotel organization that justify the hotel's role in the process of ICTs implementation. The variables in the research are a reflection of the statements from each construct that identifies a certain component of the hotel organization whose attitude want to be examined, hence the structured variables in the constructs are coded. The research

hypotheses are connected to desired statements that are examined from hotel managers and unify their views hence each individual construct has one hypothesis. After that, the respondent's segments are analysed with regard to the quality of their answers regarding the readiness to applicate the ICTs in hotel organizations. The results of the survey were conducted using statistical methods of descriptive statistics, correlation of measured variables in the model, and a significance test in order to obtain answers to the set hypotheses. Finally, explanations about the status of each hypothesis, possible implications and limitations, and recommendations for future research are given in the conclusion of this paper.

## 1. LITERATURE REVIEW

There are different views on the role of ICT in the hotel industry. Some authors believe that the main advantage of implementing ICT in hotels is the achievement of a competitive advantage for the business system, which makes it recognizable on the market. Others postulate that the ICT implementation in hotels should reflect a more innovative business that follows contemporary trends and aims to meet the exigencies of target segments for greater interaction with digital tools. For the purposes of creating this work and conducting research, analysed articles are connected to research on the possible effects that are realized in hotels under the role of ICT and digital technologies. Implications and recommendations for further research of selected scientific articles created a motive for carrying out a research in this paper.

Authors (Mihalic and Buhalis 2013; Jajić, Spremić and Miloloža 2022; Savastano et al. 2022; Zentner, Spremić and Zentner 2022) investigated by the SME, CAF and regression (OLS), the ICT effects on the competitiveness of organizations in tourism with regard to work productivity and the dissemination of knowledge, which gives hotels a greater potential for recognition. They believe that hotels will recognize from time to time the key role of implementing ICTs in hotels in providing services, especially by raising the quality of interaction between employees and guests. However, the foundation of the hospitality sector is a satisfied guest as a result of achieving excellence in meeting their demands and needs. Also, they pointed out it would be desirable that subsequent research should be stricter on a smaller geographical area such as hotel organizations in a certain region (Koo et al. 2019; Mihalic and Buhalis 2013; Singgalen and Timisela 2021; Yorkulov et al. 2022). On the other hand, some authors determine the importance of improving the integrated information system in hotels with the aim of better data processing, reporting and ultimately more efficient control in the organization through the examination of managers in IT sectors of hotels. In this way, the system would be better informed about what guests want from hotel services, what is good for them, and what needs to be improved (Ghani et al. 2022). They believe that the costs of such an implementation are high and that this is the reason that hotels have not yet recognized the importance of networking all functional units of the organization. However, the hotel staff is not sufficiently educated in the matter of knowing how to work with digital technologies (Gonzalez et al. 2020). In addition, they argue that it is desirable to examine the development and role of hotel strategic activities to provide guidance to IT professionals and operators (Buhalis and Moldavska 2021; Fulton 2020; Torres 2018; Wynn and Jones 2022).

The hotel industry represents one of the industries in which the implementation of ICT brings the greatest sophistication to the set of services that the business creates and ultimately provides to guests. These are the organizations that are among the most rapid when it comes to making a decision to adopt technologies, and it is very important to investigate the key factors of their implementation. (Infante-Moro et al. 2021; Wahab et al. 2022). Among these authors there is a thinking that hotel managements, who are sometimes not aware of the importance of the role that ICTs play in the business of the hotel industry, observe these technologies with some trepidation. They mostly reflect on the challenges that arise in connection with the implementation, namely high costs, demand for which technologies are not decisive in the consumption of services, and the questionable digital literacy of employees. Although, they postulate that the application of digital technologies should be a necessity due to contemporary trends, the convergence of technological developments and disruptive effects on the market. Mentioned authors came to the conclusion that the implementation of ICT in hotels represents numerous effects from different contexts, from the technological side it is complexity, compatibility, recognition, support of information systems; in the organizational sense, the effects refer to a higher level of support from top management, leader characteristics, readiness for new work methods, while from the environmental aspect, it represents the sustainability of the system, pressure on competitors, readiness for risk (Leung et al. 2015; Domanski 2020; Zaki 2022). All this represents a strong competitive advantage that the hotel provides by making a decision and implementing digital technologies.

For future research, they suggest the classification of factors into certain hotel components of the organization. On the basis of the selected works that investigated the impact and role of ICT on hotel organizations for the purposes of the research, an effort is being made to create a framework for the implementation of this research. Through the analysis and review of scientific papers that prove to be relevant for the creation of a research framework, a questionnaire was created in order to examine the readiness of hotel organizations to introduce ICT. The process of shaping and creating constructs and statements in the questionnaire was done on the basis of selected works, their implications and research recommendations.

## **2. RESEARCH METHODS**

In this research, a systematized survey questionnaire in Croatian language was benefited as primary research, which combines five components of the hotel organization: product, strategy, human resources, technology and ecosystem. The research population consists of managers at top, middle and operational levels of management who are employed in categorized hotels in the Dubrovnik-Neretva County in the Republic of Croatia. The selected research sector is the service sector, which is related to tourism and hospitality. The sampling method is a systematic purposive, and the research was conducted in February 2023.

The first step of the research process was a data selection of a questionnaire formed into statements according to the Likert scale of agreement in Google Forms, with the aim of obtaining the opinions and attitudes of managers on the readiness of the hotel

organization for the introduction of ICT. The questionnaire consisted of 34 questions systematized by components of the hotel organization, which were divided into constructs. For each construct, a set of statements is determined in a way of the best description the readiness of the hotel organization to introduce ICT in the order mentioned earlier. After expressing agreement with a certain statement in each part, respondents were asked a set of questions about their age, level of education, workplace, hotel location and level of categorization (number of hotel stars).

The second part of the research refers to a data collection based on a questionnaire sent to the emails of hotel managers in February 2023. There are 77 hotels registered under three stars in the Dubrovnik-Neretva County: 31 have three stars (\*\*\*) , 28 have four stars (\*\*\*\*) and 18 have five stars (\*\*\*\*\*). 64 responses were collected from respondents who expressed their degree of agreement with the statements made and thus gave their own position on the readiness of the hotel where they work for the introduction of ICT within that organization. The answers obtained became the basis for this as well as future research that will be conducted.

In the third step, on the basis of the collected data, variables for analysis were formed and descriptive statistics, correlation and non-parametric significance test analyzes were performed. Data analysis using descriptive statistics provides an overview of frequencies, mean values of variables and asymmetry measures. Correlation was used to analyse the relationship between variables and their significance at the level of 5%. In addition, a non-parametric test of significance, Chi square, was carried out, which tries to answer the set research hypotheses. The methods implemented in this research for the purposes of analysing the attitudes of hotel managers at management levels are optimal because they provide results which present the decisions of testing the hypotheses and the relationships between different groups of variables in the constructs. By analysing descriptive statistics, Cronbach Alpha, Kolmogorov Smirnov Z test, an attempt is made to obtain a descriptive representation of the average and positional statistical values of the variables in the constructs, their degree of dispersion and normality of distribution, and the consistency of the respondents' attitudes in the questionnaire. The utilization of the Spearman correlation coefficient and the non-parametric Chi Square test, the goal is to determine the direction and strength of the relationship between the variables in the constructs and to test the set research hypotheses based on which the results can be processed and certain findings can be made.

### **2.1. Variables measuring**

The variables in the research were formed as statements that were measured according to the Likert scale of agreement with the thesis on a scale of values from 1 to 5, where 1 marks the lowest degree of agreement (highest degree of disagreement), that is, 5 represents the highest degree of agreement (lowest degree of disagreement) with a certain statement. When forming certain constructs or statements in the survey questionnaire, this research relies on the TOE framework for identifying the impact of technology on various organizational aspects in the business system. The TOE framework explains how innovations are adopted and provides a useful analytical framework for examining how various types of technology are embraced and assimilated. This framework illustrates

how the technological context, organizational context, and environmental context all have an impact on how a corporation absorbs and executes technological breakthroughs (Tornatzky et al. 1990; Handayani and Er 2019). Considering that the questionnaire was conducted in Croatian, in certain terms related to different types of ICTs, there is a slight discrepancy in the questionnaire with the construct "Platform", during the translation into English for the purposes of writing the research. The observed variables are systematized into 5 constructs of the hotel organization: product, strategy, human resources, technology and ecosystem. Each construct contains a different set of variables depending on the tendency to examine a particular construct to a greater extent. Variables are coded simply with respect to the name of the construct in which they are represented and their order in the set of statements. An overview of the constructs, variables and their codes is given in the Table 1.

Table 1: **Research variables description**

Research constructs	Abbreviation of variables	Description	Adaption sources
Content	CON1	The application of ICT make easier hotel's services access for users.	Adapted from: (Savastano et al., 2022; Zentner, Spremić and Zentner, 2022)
	CON2	ICTs enable easier access for users to get all information about reservations.	
	CON3	Hotels significantly provide better service to guests with ICTs.	
	CON4	Digital technologies have a positive effects on the development of new products.	
	CON5	Big data is used for more efficient creation of hotel's services.	
Strategy	STR1	The continuous improvement of ICT in the hotel organization is valued.	Adapted from (Ivančić, Vuksic and Spremic, 2019; Zentner, Spremić and Zentner, 2022)
	STR2	ICT represent a competitive advantage for the hotel organization.	
	STR3	ICT enable easier networking with partners.	
	STR4	ICT create added value in the hotel business system.	
	STR5	The existence of strategic initiatives for the ICT application in the hotel.	
Human resources	HR1	Hotel employees are familiar with the features of ICT.	Author's work
	HR2	Hotel employees accept digital technologies in carrying out business activities.	
	HR3	Hotel employees have sufficient skills of ICT.	
	HR4	Hotel employees are willing to educate themselves for acquiring knowledge and skills related to digital technologies.	
	HR5	Hotel managers are continuously educated using modern methods and digital tools.	
	HR6	Hotel managers perceived the new trends of digital transformation.	

Table 1 (continued)

Research constructs	Abbreviation of variables	Description	Adaption sources
Platform	PLA1	Business processes in the hotel are digitized.	Adapted from: (Jajić, Spremic and Miloloža, 2022) and (Ivančić, Vuksic and Spremic, 2019)
	PLA2	Tendency for implementing robots appears in hotel's activities.	
	PLA3	Tendency for implementing technologies of virtual reality (VR) appears in hotel's services.	
	PLA4	Tendency for implementing technologies of augmented reality (AR) appears in hotel's services.	
	PLA5	Tendency for implementing Big data appears in hotel's business.	
	PLA6	Tendency for implementing Internet of Things (IoT) appears in hotel's services.	
	PLA7	Tendency for implementing appears artificial intelligence system (AI) in hotel's business.	
	PLA8	Management efforts through various digital systems affect better interaction with guests.	
	PLA9	The digital equipment in the hotel is quite old.	
Ecosystem	ECS1	Top level management provides an opportunity for new ideas related to the implementation of ICT.	Adapted from: (Savastano et al., 2022) and (Ivančić, Vuksic and Spremic, 2019)
	ECS2	The application of ICT is part of vision in hotel organization.	
	ECS3	Hotel cooperates with institutions regarding the provision of digital training for employees.	
	ECS4	There is tendency for creating an internal digital platform for the control and development of the entire hotel system.	

Source: Author's work

## 2.2. Evolution of Hypothesis

The impact of ICT is huge for tourism and hospitality sector; their application enters all aspects of business. It is becoming more and more important to adapt certain businesses to digital transformation (Nguyen and Nguyen 2022). A growing trend of identifying work in tourism with digitization is driver of development of hospitality sector. Setting research hypotheses is based on the assumption that new ICT implementation trends appearing on the tourist market seek to improve the hotel organization system. Hotel organizations gain a competitive advantage in the market only if they are ready to apply innovations in their work. With the development of ICT, it becomes available to the tourist to find, book and pay accommodation in a short time of a few minutes via the Internet or in recent times through mobile applications (Wei 2016). The hypothesis is elaborated on the basis of creating a competitive advantage for the hotel implementing ICT in components that are related to complexity in the service provision process affect possible quality improvement. This requires the engagement of all levels of management, especially in the sphere of identifying those services and products that are suitable for such an implementation that will suit both the employees and management of the hotel

as well as the users. The hypotheses are designed in such a way that they want to give an answer to a question that applies to each component of the hotel organization.

The hotel product is the basis of recognition of the business of every organization, including hotels. In the base of hotel's ability to provide its services in the best possible way with maximum guest satisfaction is the goal of every successful operation. In today's cases, product quality is not only what affects on hotel's recognition, hence the level of innovation for a certain set of services has applied in its provision and create added value on business. In view of the above, a hypothesis H1 is postulated:

*H1: The ICT usage in consuming services represents a competitive advantage for the hotel.*

Also, this research seeks to determine what extent hotel organizations have strategic frameworks based on which they project activities related to the organization's readiness to initiate ICT application in the hotel (Jaremen 2016; Garbin Praničević and Mandić 2020). ICT provides the digital commercialization of the strategy of the hotel organization, especially when improving work productivity, introducing innovations into business processes, improving the quality of the system in order to achieve a competitive advantage (Gruescu et al. 2009). In addition, ICT makes it easier and simpler to establish a network with stakeholders mainly when it comes to network distribution and creating a vision for new strategic initiatives. The maximization of digital technology should attract managers to establish adoption and knowledge-sharing techniques to use in their decision-making (Khan and Hossain 2018). The second hypothesis tends to investigate the hotel's strategic initiatives in terms of competitive advantages regarding the implementation of ICT.

*H2: The hotels have strategic initiatives for the ICTs implementation.*

Furthermore, in this research, the human resources available to the hotel and their ability to know how to apply them in certain business processes are put into relation. The hospitality industry has long faced challenges in recruiting and retaining talent due to its reputation for lower wages and physically and emotionally demanding tasks (Ghani et al. 2022). An existence of the right leaders is crucial for the implementation of ICT because of the large degree of operational and cultural changes that these technologies require. Hotels must have the right leaders who understand digital technologies to manage in a way that they will be able to follow. A careness should be taken to strengthen teams and build the competences of workers, both beginners and future leaders. For this process, cooperation, cohesion and coordination at all levels of organization are of great importance (Kumar and Passah 2019). There are great challenges with the labour in the service sector which in itself requires a specific approach based on the values of good manners, kindness and hospitality. for this reason, it is considered that the workforce in tourism is irreplaceable and crucial for achieving an acceptable level of guest satisfaction and recognition of the hotel's service quality. The connection between knowledge of digital systems and the structure of the workforce in the organization is very complex (Khan and Hossain 2018). However, it is considered that a high level of technological sophistication can reduce the amount of interaction between employees and guests, which in certain cases can pose a danger to the organization, especially if the habits of



the target segments are such that they are willing to have a high level of physical and verbal interaction in the hotel (Passah and Kumar 2019). Precisely for this reason, the following hypothesis provides us with an answer to how much effort the hotel management invests in raising the awareness of employees about the implementation of ICT and what kind of real skills regarding these technologies are used in daily work tasks. The hypothesis refers to the recognition of strategic activities and the focus of hotel management on the potential application of ICTs as well.

*H3: The human resources at all levels of management indicate readiness for the implementation of ICT in hotel organizations.*

The development of ICT and digital transformation has created a disruptive effect on the business organization in tourism, representing a necessary process of improving the equipment of hotels and facilities that are increasingly carrying out in order to be recognizable and achieve a competitive advantage on the market. The implementation of certain technologies is no longer a recommendation, hence becomes an obligation that hotels follow in order to be competitive, have value on the market and available to meet the dynamic modern demands of the segments in a high-quality manner. Robots have become the usual situation in the hotel industry. With the advancement of artificial intelligence (AI) interfaces supported by such robot technology, hotels are beginning to adapt more and more. With their ability to communicate continuously and provide a wide range of hotel services, service robots are gaining important roles in hotel organizations (Tuomi et al. 2021). The robots can communicate with guests in different languages depending on the country based on strong artificial intelligence (AI) software support. One of the novelties is robotic chatbots that provide extremely fast answers on live chat. On the one hand, VR simulations would rank as the best tool for achieving ultimate control over a situation. The hotel industry has been promoting the use of virtual reality (VR) applications for a number of years. One of the earliest forms of virtual reality is VR-tour, which allows users to view images from any language. With a mouse or a keypad, a person can view a digital panorama with a view of 360 degrees while also viewing the inside of a hotel (Han and Dieck 2019). On the other hand, enhancing the physical world and the experience of discovering one's surroundings in real time are the goals of augmented reality (AR). The system works by superimposing digital elements onto a real-time image of reality that is easily accessed via a smartphone. Because of this, augmented reality (AR) has enormous potential for improving customers' indoor experiences in the hospitality sector (Buhalis and Moldavska 2021). By connecting with consumer behaviour and interactions, big data is stealing the hospitality sector. In order to improve performance and revenue, hotels and other establishments operating within the hospitality sector are becoming more familiar with the concept of big data (Alshurafat and AL Shbail 2021). Big data is used by hotels to manage and price their guests and provide a tailored experience. For hotels, these data are mainly based on: accommodation capacity occupancy rates, booking trends, performance indicators, local events, procurement of goods, etc. high-quality filtering, summarization and reduction of such data can contribute to a hotel's better technical performance, cost reduction and, ultimately, higher profits. All of the above is done by Big data (Yallop and Seraphin 2020).

IoT provides incorporated services to the hospitality sector through network-connected voice assistants, automated door locks, light switches, and electric blinds (Car et al. 2019; Sharma and Gupta 2021). Additionally, IoT extends beyond practicality and offers more individualized and tailored service. With more connected devices gathering client data, IoT in the hospitality industry still has a lot of potential. As much as the aforementioned statements determine the high benefits and key effects that the implementation of different types of digital technologies can provide for the hotel, the decisions of the hotel management on the application of the mentioned technologies are conditioned by numerous factors such as: digital literacy, business climate, revenue structure. However, the implementation process, which requires the acquisition of tools, program licensing, and all the necessary installation, represents high costs for every organization, including for the hotel, so deciding on such an investment for the hotel is extremely important. Established hypothesis examines whether hotel organizations have a tendency to applicate different forms, systems and tools of digital technologies.

*H4: Hotels strive to have better technological equipment in their operations.*

ICTs for organizations ensures the focus of business on the environment in which it performs its transactions so that the hotel can focus on external aspects that directly or indirectly affect the hotel's operations, such as government regulation, taxes, social norms and ethics (Pouri and Hilty 2018). The acceptance of technological innovations also affects the sustainability of the hotel business system, so organizations gain additional responsibility and principles towards the environment, the local population, and the state, which they must respect as part of their existence on the market. The transformation of tourism as a whole, including hotel organizations, takes place under the means of ICT, the introduction of which enables various competitive advantages. The external environment of hotel organizations should not be neglected in the focus of the sustainability of hotel business and the achievement of goals in the market. It greatly helps every organization to create a favourable culture for the development of the business. There is great potential in networking with stakeholders on the basis of which organizations is created for future strategic activities, ideas and visions, in order to control and develop the whole system.

*H5: The readiness of hotel has a positive effect on ecosystem.*

### **3. RESULTS**

The results of the descriptive statistics analysis were obtained for the variables of each individual construct whose values will be described. The total number of top, middle and operational management level managers in hotels who gave ratings and choose the degree of agreement with the statements is 64 (N = 64). According to the average values (MEAN) of the observed variables, all values exceed the middle, then it can be determined that the respondents mostly rated the statements with a better rating and higher degree of agreement. The Variation coefficients for the observed variables in constructs: Content, Strategy, Human Resources and Ecosystem are less than 30%, hence the level of dispersion around the MEAN is lower, while for the variables related to the

Platform construct, mostly have a value of the Variation Coefficient greater than 30%, the values disperse more around the mean value.

Table 2: Descriptive analysis

Constructs	Variables	N	Mean	Std.Dev	Var.Coeff	p-value	Kolmogorov Smirnov Z	Cronbach Alpha
Content	CON1	64	4.4839	0.8045	17.94%	0.0000	0.935	0.900
	CON2	64	4.3548	0.8512	19.55%	0.0002	0.912	
	CON3	64	4.4032	0.7780	17.67%	0.0035	0.932	
	CON4	64	4.2903	0.8757	20.41%	0.0035	0.897	
	CON5	64	4.1452	1.0378	25.04%	0.0018	0.795	
Strategy	STR1	64	4.1452	1.0057	24.26%	0.0148	0.887	0.894
	STR2	64	4.2419	0.9177	21.63%	0.0052	0.88	
	STR3	64	4.1613	0.9442	22.69%	0.0290	0.892	
	STR4	64	4.3065	0.8413	19.54%	0.0009	0.891	
	STR5	64	4.2581	0.9221	21.66%	0.0000	0.833	
Human Resources	HR1	64	3.9194	1.0758	27.45%	0.0188	0.866	0.953
	HR2	64	3.9355	1.0538	26.78%	0.0720	0.812	
	HR3	64	3.8710	1.0320	26.66%	0.1000	0.815	
	HR4	64	4.0000	1.0243	25.61%	0.0564	0.803	
	HR5	64	4.1290	1.0160	24.61%	0.0197	0.885	
	HR6	64	4.2742	0.9084	21.25%	0.0018	0.887	
Platform	PLA1	64	4.0484	1.0311	25.47%	0.0302	0.878	0.959
	PLA2	64	3.4839	1.2898	37.02%	0.2045	0.751	
	PLA3	64	3.6129	1.2194	33.75%	0.1667	0.81	
	PLA4	64	3.5484	1.2633	35.60%	0.1455	0.746	
	PLA5	64	3.5806	1.1387	31.80%	0.2689	0.821	
	PLA6	64	3.7258	1.1618	31.18%	0.1460	0.749	
	PLA7	64	3.5968	1.2605	35.05%	0.1481	0.738	
	PLA8	64	4.1452	0.9725	23.46%	0.0000	0.832	
	PLA9	64	3.9677	1.0397	26.20%	0.0580	0.791	
Ecosystem	ECS1	64	4.1290	0.9493	22.99%	0.0434	0.81	0.943
	ECS2	64	4.0968	0.9358	22.84%	0.0343	0.801	
	ECS3	64	4.0968	0.9532	23.27%	0.0034	0.843	
	ECS4	64	4.1129	0.9599	23.34%	0.0326	0.806	

Source: Author's work

The variables in the constructs: Content (CON), Strategy (STR), Human Resources (HR) and Ecosystem (ECS) show significance lower than alpha ( $\alpha = 0.05$ ) level of 5% significance, while the variables in the construct Platform (PLA) are mostly not significant, hence these p-values are greater than 5% of the alpha level. This could prove a greater degree of differentiation of respondents' answers, cause of the precisely PLA are considered to have the greatest effect on the readiness of hotel organizations to implementation of ICT and digital technologies.

Moreover, the values of Cronbach Alpha for measuring internal consistency for all constructs are higher than the test reliability limit of 0.50, it can be concluded that the data are consistent and closely related in this research. A normal distribution testing was performed with the Kolmogorov Smirnov Z test (K-S test) which provides an insight into whether the obtained data deviate significantly. The results of this research show that the Kolmogorov Smirnov Z test is greater than the critical value of 0.17 for the significance

level of 5% ( $\alpha = 0.05$ ) and for 64 observations (N=64). The data deviate from the normal distribution, do not follow a specified distribution and this research rejects the null hypothesis, hence the data in the series are not normally distributed.

**Table 3: Socialdemographic characteristics of the respondents**

Age	Frequency	%
<36	8	12,50
36-45	30	46,88
46-55	21	32,81
>55	5	7,81
$\Sigma$	64	100,00
Education Degree	Frequency	%
Completed Secondary Education	3	4,69
Baccalaureus	21	32,81
Master of Art	7	10,94
Master of Science	33	51,56
PhD	0	0,00
$\Sigma$	64	100,00
Job Position	Frequency	%
Hotel Manager, CEO	28	43,75
Sales Manager	14	21,88
Finance Manager	5	7,81
R&D Manager	4	6,25
Operations Manager	9	14,06
Accounting Manager	2	3,13
Maintenance Manager	2	3,13
$\Sigma$	64	100,00
Location	Frequency	%
Dubrovnik	34	53,13
Korčula	12	18,75
Smokvica	3	4,69
Orebić	11	17,19
Cavtat	2	3,13
Mljet	2	3,13
$\Sigma$	64	100,00
Hotel Categorization	Frequency	%
3 stars	17	26,56
4 stars	27	42,19
5 stars	20	31,25
$\Sigma$	64	100,00

Source: Author's work

Table 3 presents the characteristics of the respondent, managers at different levels of management in hotel organizations according to age, employment position, level of education, location of employment and categorization level of the hotel where they work. Among the examined managers, almost half of them are between the ages of 36 and 45, and even more than half of the managers declared that they have a Master of Science degree. More than 40% of the managers who filled the questionnaire are employed as hotel managers, CEOs, 14 of them are sales managers, and the fewest surveyed managers are from accounting and maintenance, only 2 respondents each. The most of the surveyed managers work in four-star hotels, while more than half of the managers work in Dubrovnik, which makes sense because Dubrovnik is the largest city and center of the tourist region.

For analyzing the correlation between the observed variables, Spearman's correlation coefficient analysis was performed to determine the direction and strength between the manifested variables. All values of the Spearman correlation coefficient are positive, which indicates a positive direction between the observed variables. The correlation coefficient values range mostly between 0.5 and 0.9, except for the construct's Platform variables (PLA). It is noticed that the correlations with the variables in the Platform construct are below 0.5, hence the connection with the variables of that construct is less than 0.5 and the correlation of variables from other constructs with them is weaker. The examination of the set hypotheses was carried out by analyzing the non-parametric Chi Squared test. The decision for the hypotheses with regard to the calculation of the Chi Squared test are given in the Table 4.

For the hypothesis H1, an analysis of the Chi Square test was carried out for the construct "Content", which refers to a group of variables related to the hotel's readiness to improve the providing of products and services through the implementation of ICTs. The testing of Hypothesis H2 is based on a group of variables from the "Strategy" construct, and is related to the existence of strategic initiatives of hotel organizations for ICTs implementation in business. For the hypothesis H3, an analysis of the Chi Square test was carried out for the construct "Human Resources", which refers to a group of variables related to whether hotels implement ICTs with regard to employee characteristics and working conditions. When testing the hypothesis H4 for the analysis of the non-parametric Chi Square test, a group of variables of the "Platform" construct is used, which refer to raising the level of ICTs application in hotels, while H5 is reflected on the "Ecosystem" construct, whose variables are related to the hotel's involvement in cooperation, encouragement idea and a greater concern for innovation.

Considering the conducted research results of non-parametric test Chi Square (Table 4), one of five research hypotheses is accepted below the 5% level of significance. Among the accepted hypotheses are H3. In the observed research, in which the readiness of hotel organizations to accept ICT in business was examined according to the Chi Square test of significance, H3 is accepted and it can be determined that employees and hotel managers pointed out they have appropriate literacy and readiness for implementing ICT in hotels. Although it is a specific staff that in tourism is characterized as indispensable for the service provision component in the hotel because one of the results of staff efficiency is the satisfaction of guests, the amount of human potential suitable for the dynamic demands of guests is decreasing (Buhalis and Moldavska 2021; Wahab et al.

2022). Therefore, certain work processes are being increasingly automated in hotel businesses in order to increase work productivity and open up space for employees for more complex activities at work. This confirms the already mentioned circumstances in which it is necessary to involve hotel employees in modern methods of work at all levels, starting from the top to the operational level of management. Also, the benefits that ICT can provide to the hotel for a more efficient division and organization of work have a key role for hotel management. The reason why there is a negative correlation between the high average value of agreement with the respondent's statement for certain variables in a group of a construct and the decision in the hypothesis testing process can be attributed to the lower intensity of the respondent's consistency for individual variables or statements in the construct. For example, in the construct "Platform" there are claims that refer to the hotel's tendency to implement different types of ICTs, hence some respondents may consider that the hotel has a tendency to implement IoT system technology, while at the same time certain managers consider that the hotel is not ready to implement the Big data system given in business. Also, in the constructs there are certain variables whose p-values differ significantly between the variables cause of individually observation.

Table 4: Decision for hypothesis

FACTORS	CHI SQUARED TEST	p-value	DECISION
CON	0.0804	>0.05 (<0.10*)	H1 <input type="checkbox"/> (H1 <input checked="" type="checkbox"/> )
STR	0.9228	>0.05	H2 <input type="checkbox"/>
HR	0.0121	<0.05**	H3 <input checked="" type="checkbox"/>
PLA	0.1579	>0.05	H4 <input type="checkbox"/>
ECS	0.9500	>0.05	H5 <input type="checkbox"/>

Source: Author's work

This research demonstrated that four of five hypotheses were rejected at the significance level of 5%, which sufficiently indicates how much there is a certain discrepancy between the readiness of the hotel to adopt and apply ICT in its own business system. H1, which refers to the aspect of products and services offered by the hotel, is rejected. It is obvious that the examined hotel managers did not recognize the readiness in the organizations where they work with regard to the product and service spectrum of the hotel's offer. The implementation of ICTs into the system of providing services to hotel guests may depend on the conditions that are suitable for such cases to become applicable. A conditions represent the core of H1 and the basis for implementing ICT are related to the tendency of hotel owners to make certain hotel services simpler, more automated and more efficient in the interaction between employees and guests (Garbin Praničević and Mandić 2020).

It is somewhat related to H2, which was also not accepted, according to the conducted test, strategic activities are not focused enough on the implementation of ICT in hotels. Hypothesis H2 is intended to be proven by the strategies of hotel organizations whose goals include the application of ICTs are the result of recognizing whether such technologies can create added value and a potential competitive advantage for hotel business. In this process, it is very important to calculate whether there are indicators

that can justify strategic initiatives for the possible implementation of ICTs, that is, certain measurable contributions for their evaluation.

Hypothesis H4 reflects on the increase of technological equipment and software complexity that the hotel strives to achieve in order to follow modern trends and innovative business approaches. A certain studies in the literature review interpret that is an unquestionable feature for the hotel business to have modern equipment and technological recognition in today's era when the effect of disruption is increasingly pronounced. However, the readiness of the hotel organization to raise the level of technological tools, among other things, depends largely on factors related to the target segment that is concentrated in hotels, as well as the level of digital literacy of employees (Yorkulov et al. 2022; Wynn and Jones 2022). According to the research, H4 is not accepted and managers believe that there is no intensive level in the effort to applicate digital technologies in hotel organizations and not enough elements to achieve a higher level of the technological component. In the Platform construct connected to H4, several types of ICTs are combined, so the general attitude of managers is like this, although for some technologies or tools, if they were looked at separately, they could show a greater readiness.

In the long term, ICTs implementation can affect the improvement of TQM based on the acquisition of partnerships with institutions for training employees in increasingly demanding working conditions imposed by the convergence of digital transformation. Improving the business ecosystem perceives competition as a new type of cooperation because mutual activity, especially in the hospitality sector, can be used to identify needs for system improvement (Pouri and Hilty 2020). Besides that, H5 is rejected, which displays the hotels did not recognize a benefits of ICT for the ecosystem and the competitive advantage that the ICT application would have for the organization's business. If we assumed that the variables were observed in the research and the hypotheses were tested at a significance level of 10% ( $\alpha = 0.10$ ), then H1 would be accepted and the other hypotheses H2, H4 and H5 would be rejected.

## CONCLUSION

This article presents an examination of the readiness of hotel organizations to implement ICT in business. The dynamics of technological development in all economic activities led to the exigency for improving operations in the service sector. This is precisely why certain entities of the tourism supply strive to continuously develop business with various innovative methods and digital tools. ICT is increasingly showing great potential and benefits for hotel organizations in the form of creating a competitive advantage, raising the quality of hotel services, simplifying the work of hotel employees, better interaction with guests, etc. The reason for the research is motivated by the lack of certain works related to the examination of the readiness of hotel organizations in a specific region where tourism plays a crucial role. The literature review of relevant scientific works determined the factors and methods applied in this research. The research population consists of managers at top, middle and operational levels of management who are employed in categorized hotels in the Dubrovnik-Neretva County in the Republic of Croatia. The sampling method is a systematic purposive, and the research was conducted

in February 2023. The obtained data was collected by primary research, examining the attitudes or agreement with the statement of hotel managers at the top, middle and operational management levels using a Likert scale. The variables were formed as statements that were made, while the constructs were formed as components of the business of hotel organizations whose readiness was tried to be examined. After the analysis of descriptive statistics and correlation using Spearman's coefficient, the testing of the set hypotheses was carried out using the non-parametric Chi Squared analysis of inferential statistics.

The results of the research demonstrate that all variables except those related to the "Platform" construct are significant and have a moderately strong and positive correlation. Four of five set hypothesis are rejected at the significance level of 5%. Considering the acceptance of H3 for the Human Resources variable, it can be concluded that the examined managers determined the readiness of the Human Resources component for the ICT application in the hotel organizations activities. This builds on previous evidence related to the relationship of employees with the application of digital technologies (Domanski 2020; Buhalis and Moldavska 2021; Infante-Moro et al. 2021; Wahab et al. 2022). Certainly, hotels perceive an opportunity to establish and implement ICTs so that certain deficiencies in employee efficiency can be neutralized and improved. Although, the human resource will still remain irreplaceable and one of the most crucial for successful business in a sector such as tourism by nature of the activity. The hypothesis H3 that is confirmed relies on the reviewed previous research, which agrees with the possible technological effects on employees of organizations in the service sector that show openness to innovative approaches and new digital tools. Moreover, the growing involvement of digital technologies in tourism increases the focus of hotel management on raising the level of competencies and skills of hotel employees. (Wahab et al. 2022; Zaki 2022). ICTs in business enables more efficient distribution and organization of work, simplification of business activities, possibility of upgrading employee's knowledge and skills. In addition, digital technologies would ensure in the business systems of hotel organizations that hotel employees can devote themselves more to certain more complex business tasks. Assuming that the research was conducted at a significance level of 10%, then H1 is accepted. Accordingly, it can be postulated that hotel organizations are ready to implement ICTs in order to make the hotel content more recognizable, i.e. the set of products and services provided to guests, thus also the possibility of better meeting the needs of guests and creating a competitive advantage on the market. It is precisely linked with H1 because some authors emphasize the importance of applying ICT to the business content, which today is increasingly adapting to digital technologies due to the higher demands of service users. (Mihalic and Buhalis 2013; Torres 2018; Yorkulov et al. 2022; Wynn and Jones 2022).

On the basis of research in which managers at top, middle and operational levels of management were examined, it can be concluded that hotel organizations are unprepared to implement ICT in the Dubrovnik-Neretva County. As many as four out of five hypotheses according to the non-parametric Chi Square test are rejected at a significance level of 5%, thus showing a certain unreadiness of hotel organizations to implement ICTs. This research presents a certain unreadiness for the ICTs implementation in hotel organizations from the aspect of providing services, technological improvement and the ecosystem, which is demonstrated in the rejection of hypotheses H2, H4 and H5 at a



significance level of 5% (H1 is accepted at 10%). In the research review, some authors emphasized the possible challenges and difficulties that arise in connection with the implementation of ICTs in hotels (Mihalic and Buhalis, 2013; Ghani et al. 2022; Wynn and Jones 2022), but for the majority this is not the case because they consider that the application of certain technologies that are recognized as necessary for hotel business should be a necessity for improving the business of the entire ecosystem, raising the quality of technological equipment and developing innovations with regard to market dynamics (Domanski 2020; Infante-Moro et al. 2021; Singgalen and Timisela 2021; Wahab et al. 2022; Yorkulov et al. 2022). In particular, if one looks at the groups of variables in the "Platform" and "Strategy" constructs, it can be concluded that in those areas of business that are key to the implementation of ICTs in the hotel, a sufficient level of readiness was not achieved according to the hypothesis test for those groups of variables. The climate which prevails in the hotels of Dubrovnik Neretva County is clearly not satisfactory to demonstrate readiness, although regardless of the case of this research for the implementation of ICTs in the mentioned region for hotels has potential. It is obvious that hotels in a specific tourist region have not recognized the importance and value that ICTs brings to the hotel business system. Such a statement is also linked to considerations that the segment of guests coming to the mentioned region, according to which hotels do not feel the need of ICTs application in their operations. Although, the very convergence of development and the continuous trend of ICTs application in the service sector implies a level of adaptation and improvement of all components of the hotel organization's activities. For this reason, the research was conducted in the period before the tourist high season, when hotels often introduce new innovative models into their operations.

This research had certain limitations that mostly related to the adaptation of the research framework in the context of the components that certain authors investigated. However, this limitation could be neutralized more and more as by upgrading the TOE framework. Moreover, there is often a level of subjectivity when filling out questionnaires by hotel managers, hence certain indicators and variables with regard to the degree of agreement with the statement do not seem realistic. The sample of 64 surveyed hotel managers is potentially not sufficient to give general conclusions about the readiness of hotel organizations to implement ICTs, but this research aims to provide insight into the case for a specific tourist region and provide opportunities for further research. For future research, it would be useful to investigate which categories of hotels with regard to the number of stars show a greater degree of readiness for ICT implementation. This type of research can be applied to smaller hotels or themed hotels such as: green hotels, hotels in rural areas, heritage hotels, because this type of hotel relies on sustainable development, which itself is significantly related to ICT. In addition, the Chi Square test, which is conducted in this research, shows some shortcomings in hypothesis testing for a relatively small sample of 64 non-random subjects, hence it should be considered for future research to design a specific model using regression (OLS) and perform SEM analysis. Future research should upgrade the model with factor analysis or comparative analysis for a more robust assessment. In this way, certain control or dummy variables related to some socio-demographic indicators can be combined. Furthermore, it is possible to apply this kind of research to organizations operating in other sectors of the economy.

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## Appendix 1

Table A1: Survey questionnaire structure for examining hotel managers on the top, middle and operational level of management

Variable	Measurement	Likert scale of agreement - values from 1 to 5, where 1 marks the lowest degree of agreement; 5 represents the highest degree of agreement
CON1	The application of ICT make easier hotel's services access for users.	o1 o2 o3 o4 o5
CON2	ICT enable easier access for users to get all information about reservations.	o1 o2 o3 o4 o5
CON3	Hotels significantly provide better service to guests with ICTs.	o1 o2 o3 o4 o5
CON4	Digital technologies have a positive effects on the development of new products.	o1 o2 o3 o4 o5
CON5	Big data is used for more efficient creation of hotel's services.	o1 o2 o3 o4 o5
STR1	The continuous improvement of ICT in the hotel organization is valued.	o1 o2 o3 o4 o5
STR2	ICT represent a competitive advantage for the hotel organization.	o1 o2 o3 o4 o5
STR3	ICT enable easier networking with partners.	o1 o2 o3 o4 o5
STR4	ICT create added value in the hotel business system.	o1 o2 o3 o4 o5
STR5	The existence of strategic initiatives for the ICT application in the hotel.	o1 o2 o3 o4 o5
HR1	Hotel employees are familiar with the features of ICT.	o1 o2 o3 o4 o5
HR2	Hotel employees accept digital technologies in carrying out business activities.	o1 o2 o3 o4 o5
HR3	Hotel employees have sufficient skills of ICT.	o1 o2 o3 o4 o5
HR4	Hotel employees are willing to educate themselves for acquiring knowledge and skills related to digital technologies.	o1 o2 o3 o4 o5
HR5	Hotel managers are continuously educated using modern methods and digital tools.	o1 o2 o3 o4 o5
HR6	Hotel managers perceived the new trends of digital transformation.	o1 o2 o3 o4 o5
PLA1	Business processes in the hotel are digitized.	o1 o2 o3 o4 o5
PLA2	Tendency for implementing robots appears in hotel's activities.	o1 o2 o3 o4 o5
PLA3	Tendency for implementing technologies of virtual reality (VR) appears in hotel's services.	o1 o2 o3 o4 o5

Table A1 (continued)

Variable	Measurement	Likert scale of agreement - values from 1 to 5, where 1 marks the lowest degree of agreement; 5 represents the highest degree of agreement
PLA4	Tendency for implementing technologies of augmented reality (AR) appears in hotel's services.	○1 ○2 ○3 ○4 ○5
PLA5	Tendency for implementing Big data appears in hotel's business.	○1 ○2 ○3 ○4 ○5
PLA6	Tendency for implementing Internet of Things (IoT) appears in hotel's services.	○1 ○2 ○3 ○4 ○5
PLA7	Tendency for implementing artificial intelligence system (AI) appears in hotel's business.	○1 ○2 ○3 ○4 ○5
PLA8	Efforts for creating better interaction with guests through various digital systems.	○1 ○2 ○3 ○4 ○5
PLA9	The digital equipment in the hotel is quite old.	○1 ○2 ○3 ○4 ○5
ECS1	Top level management provides an opportunity for new ideas related to the implementation of ICT.	○1 ○2 ○3 ○4 ○5
ECS2	The application of ICT is part of vision in hotel organization.	○1 ○2 ○3 ○4 ○5
ECS3	Hotel cooperates with institutions regarding the provision of digital training for employees.	○1 ○2 ○3 ○4 ○5
ECS4	Tendency for creating an internal digital platform for the control and development of the entire hotel system.	○1 ○2 ○3 ○4 ○5

## Appendix 2

Table A2: Correlation analysis (continued)

	CON1	CON2	CON3	CON4	CON5	STR1	STR2	STR3	STR4	STR5	HR1
CON 1	1										
CON 2	0.7746	1									
CON 3	0.7308	0.7954	1								
CON 4	0.6118	0.6733	0.7398	1							
CON 5	0.5428	0.5903	0.6167	0.5301	1						
STR1	0.6209	0.5900	0.6364	0.5471	0.6863	1					
STR2	0.5716	0.6858	0.7107	0.5640	0.7199	0.7962	1				
STR3	0.6724	0.6619	0.6018	0.5372	0.7118	0.7691	0.7299	1			
STR4	0.6492	0.6698	0.5345	0.5448	0.5491	0.7216	0.6456	0.6590	1		
STR5	0.6023	0.5498	0.4467	0.3929	0.3371	0.5069	0.4674	0.4786	0.5092	1	
HR1	0.4625	0.3719	0.3529	0.3733	0.4218	0.6171	0.4684	0.5133	0.4443	0.6658	1
HR2	0.4048	0.3915	0.2922	0.2871	0.4884	0.5659	0.4232	0.5378	0.4479	0.5741	0.8485
HR3	0.3528	0.3889	0.3517	0.3142	0.4311	0.4922	0.4316	0.4591	0.3673	0.5868	0.8026
HR4	0.3581	0.2820	0.3086	0.3655	0.4318	0.5570	0.5058	0.5085	0.7885	0.7897	0.7909
HR5	0.5842	0.5338	0.4931	0.4731	0.4950	0.6713	0.6165	0.5589	0.6846	0.7275	0.6259
HR6	0.5108	0.4658	0.4905	0.4135	0.4440	0.6197	0.5681	0.4827	0.5598	0.6353	0.5804
PLA1	0.3270	0.3350	0.3431	0.3655	0.4376	0.4990	0.4379	0.5138	0.6686	0.7573	0.7300
PLA2	0.0866	0.1546	0.2761	0.2510	0.2896	0.4252	0.3150	0.2848	0.5839	0.5540	0.6019
PLA3	0.2776	0.2609	0.3573	0.3987	0.5115	0.5545	0.4952	0.4253	0.6631	0.6308	0.6761
PLA4	0.2185	0.2582	0.3551	0.3872	0.4260	0.5428	0.4776	0.3781	0.6000	0.5565	0.6336
PLA5	0.3325	0.2744	0.3606	0.3871	0.4963	0.5121	0.4752	0.5213	0.6277	0.6328	0.6786
PLA6	0.3547	0.2989	0.4145	0.4179	0.4551	0.5818	0.4938	0.4743	0.6772	0.6548	0.7493
PLA7	0.2764	0.2119	0.3023	0.3454	0.4465	0.5772	0.4117	0.4137	0.6526	0.6342	0.6903
PLA8	0.4745	0.3328	0.3764	0.2385	0.4011	0.5983	0.5111	0.4918	0.4658	0.5212	0.5253
PLA9	0.3717	0.3095	0.4014	0.3526	0.4754	0.5376	0.5238	0.4730	0.5693	0.5667	0.6836
ECS1	0.5609	0.4699	0.4612	0.3289	0.5298	0.5983	0.6034	0.5617	0.5722	0.6312	0.6866
ECS2	0.5247	0.4296	0.4634	0.3853	0.5255	0.5945	0.5641	0.5757	0.6755	0.6215	0.7600
ECS3	0.5579	0.4621	0.4771	0.3586	0.4828	0.6863	0.5350	0.5652	0.6792	0.6428	0.7295
ECS4	0.5012	0.3514	0.3990	0.3114	0.4441	0.6280	0.4709	0.5403	0.6281	0.5745	0.7265

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