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THE IMPACT OF INTERACTIVE HOTEL MAPPING TECHNOLOGY ON BUSINESS PROCESSES IN THE HOSPITALITY INDUSTRY

ВПЛИВ ТЕХНОЛОГІЇ ІНТЕРАКТИВНОГО КАРТУВАННЯ ГОТЕЛЮ НА БІЗНЕС-ПРОЦЕСИ В ІНДУСТРІЇ ГОСТИННОСТІ

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The article explores the prospects and main directions of development of interactive hotel mapping technology. Emphasis is placed on the integral nature of the application of innovative digital technologies in the context of digital-transformation of the business environment of the tourism and hospitality industry. The aim of the article is to investigate the impact of successful practices of interactive hotel mapping on increasing efficiency, improving and modifying business processes of companies operating in the tourism and hospitality industry. The following research methods were used: observation, systematization and analysis of practical activity of the subjects of the hospitality sphere, as well as logical-analytical and system-structural methods. Interactive hotel mapping is an application of virtual reality technology. The components of this technology are indoor navigation, routing and virtual tours. The most positive effect of the technology in question has if its application is combined with other innovative digital technologies and organically fits into business processes at different stages of the production cycle. The biggest impact of interactive hotel mapping technology is on business processes related to marketing, reservations and front office service. A successful practice is the integration of the technology in question with *Smart Room* technology. Due to the technological peculiarities of providing indoor positioning, IT-products for interactive hotel mapping tend to specialize and demonstrate a low level of unification. For OTAs (Online Travel Agencies) and other actors providing indoor services on the booking market, the most urgent problem is the problem of unification of positioning indicators. This factor should be taken into account by firms-developers of specialized software. The scientific novelty of the study consists in the clarification and systematization of successful practices in the application of interactive mapping technology; identification of the most promising areas for improving business processes under the influence of the technology under consideration. The practical value of the obtained results lies in the possibility of their use in the practical activities of both tourism and hospitality companies and companies developing specialized IT products for the tourism and hospitality industry.

Keywords: digitalization, digital transformation, business processes, interactive hotel mapping, indoor hotel navigation, virtual tours, booking system, IT products of hospitality industry.

Стаття присвячена дослідженню перспектив та основних напрямів розвитку технології інтерактивного картування готелю. Акцент робиться на інтегральному характері застосування інноваційних digital-технологій у контексті digital-трансформації бізнес-середовища індустрії туризму та гостинності. Метою статті є дослідження впливу успішних практик інтерактивного картування готелю на підвищення ефективності, вдосконалення та модифікацію бізнес-процесів компаній, що працюють у сфері туризму та гостинності. Було використано такі методи дослідження: спостереження, систематизація та аналіз практичної діяльності суб'єктів сфери гостинності; логіко-аналітичні та системно-структурні методи. Інтерактивне картування готелю – прикладне застосування технології віртуальної реальності. Складовими частинами інтерактивного картування готелю є внутрішня навігація, маршрутизація і віртуальні тури. Найбільший позитивний ефект досліджуваної технологія чинить у тому разі, якщо її застосування з'єднується з іншими інноваційними digital-технологіями та органічно вписується в бізнес-процеси на різних етапах виробничого циклу підприємств сфери гостинності. Найбільший вплив технологія інтерактивного картування готелю чинить на бізнес-процеси, пов'язані з маркетингом, бронюванням та обслуговуючими процесами front-офісу. Успішною практикою є інтеграція розглянутої технології з технологією *Smart Room*. Унаслідок технологічних особливостей забезпечення позиціонування в закритих приміщеннях, IT-продукти інтерактивного картування готелів тяжіють до спеціалізації і демонструють низький рівень уніфікації. Для ОТА (Online Travel Agency) та інших акторів, які надають посередницькі послуги на ринку бронювання, нині найактуальнішою є проблема уніфікації індикаторів позиціонування. Цей фактор необхідно враховувати фірмам-розробникам спеціалізованого програмного забезпечення. Наукова новизна дослідження полягає в уточненні та систематизації успішних практик застосування технології інтерактивного картування; виявленні найперспективніших напрямів удосконалення бізнес-процесів під впливом розглянутої технології. Практична значущість отриманих результатів полягає в можливості їх використання в практичній діяльності як підприємств сфери туризму та гостинності, так і фірм-розробників спеціалізованих IT-продуктів для індустрії туризму та гостинності.

Ключові слова: діджиталізація, digital-трансформація, бізнес-процеси, інтерактивне картування готелю, внутрішня навігація готелю, віртуальні тури, система бронювання, IT-продукти індустрії гостинності.

Introduction. Comparatively low barriers to entry into the industry and, consequently, high competition, encourage tourism and hospitality companies to constantly be in search of highly competitive innovative solutions. Currently, some of the most promising innovations are those related to digital technologies.

There are three levels of the digitalization process: digitization; digitalization; digital transformation [1]. At all these levels, digital innovations make a positive contribution to a company's success and competitiveness, but the depth and degree of impact varies. At the level of digitization, we are simply talking about converting data from analog to digital form. At the level of digitalization, we are talking about improving existing business processes. At the level of digital transformation, we are talking about the emergence of new business models influenced by digital technologies.

This study focuses on exploring successful practices of using interactive hotel mapping technology in the hospitality and tourism business. This technology is involved at all levels of the digitalization process and has a direct or indirect impact on the maintenance, improvement and modification of business processes.

It should be borne in mind that optimal results are achieved when various digital technologies are integrated comprehensively across all business units and all stages of the production cycle. Therefore, this study also focuses on

interfacing and combining interactive mapping technology with other promising innovative solutions.

Literature review. Th. Ritter, C. Pedersen in their scientific works have studied the process of digitalization of business environment, its levels and key indicators of influence [1]. V. Patel, R. Grewal, P. Jagtap, A. Gundage, A. Patel, J. Kalal, N. Mustary, N. Jailani, N. Wahab, N. Sunar, Sh. Sunar, Sh. Ariffin have studied the technical aspects of creating IT applications of indoor navigation [2; 3; 4]. J. Zhu, Y. Wang, M. Cheng have devoted their scientific works to the issue of the relevance and prospects of application of augmented reality technology in the hospitality industry [5]. M. Maragkoudakis has considered in his works the aspects of practical implementation of interactive hotel mapping technology [6]. At the same time, further research requires the problem of complex, integral implementation of interactive hotel mapping technology in various business processes throughout the technological chain of hospitality companies.

The aim of the article is to study and systematize innovative practices of interactive hotel mapping in the context of the impact on various business processes of hospitality companies.

Materials and Methods. Observation, systematization and analysis of practical activities of hospitality actors have been used

to investigate the successful experience of implementing virtual technologies. Logical-analytical and system-structural methods have been used to study the most promising directions and trends of business process improvement under the influence of interactive mapping technology.

The information base of the study includes materials from the official websites of companies developing IT products that support the interactive hotel mapping technology; scientific developments of specialists working in this area.

Results and discussion. *Interactive hotel mapping* is an augmented reality-based technique of visualizing digital information about the location and various aspects of a hotel in the context of the physical environment.

Augmented Reality applications allow the user to interact with digital objects on top of the physical world, often connecting real objects with digital content [2]. Traditional paper maps are being replaced by innovative digital solutions. The option can be easily accessed via smartphone: guests are able to use the interactive maps on their mobile devices. Thus, interactive hotel mapping effectively guides guests to rooms and other facilities.

Augmented reality technology is extremely valuable for improving the customer experience in the hospitality industry [5].

The interactive map allows you to: build routes to rooms and other locations; quickly find the areas you need (spa, restaurant, shops, meeting rooms, etc.); create interactive

tours of the property with information about the hotel's functions and individual services; track a person's location, discover points of interest, and send promotional offers.

The components of the interactive hotel mapping technology are:

- indoor navigation;
- routing;
- virtual tours (see Figure 1).

The advantage of specialized IT products for interactive hotel mapping is, among other things, to support the personalization of recreational interests through customized design that matches the concept and style of the hotel.

There are certain technical difficulties that prevent the effective use in indoor navigation of those positioning tools that are successfully used and well-proven in outdoor navigation [3]. Due to no line-of-sight, low signal strength and low accuracy, GPS is not suitable for indoor use. As a result, the indoor environment requires a different approach to the indoor positioning system. Indoor Positioning Systems provide various indoor location tracking solutions such as Real Time Location Systems (RTLS), indoor navigation, inventory management, and emergency response location systems [4]. This circumstance also contributes to the creation of specialized software products that are created directly for the needs of internal hotel navigation.

Good examples of a specialized interactive hotel mapping software are, among others, *Stay App Hotel Map* (Spain) (Figure 2a shows a fragment of an advertising offer of this application;

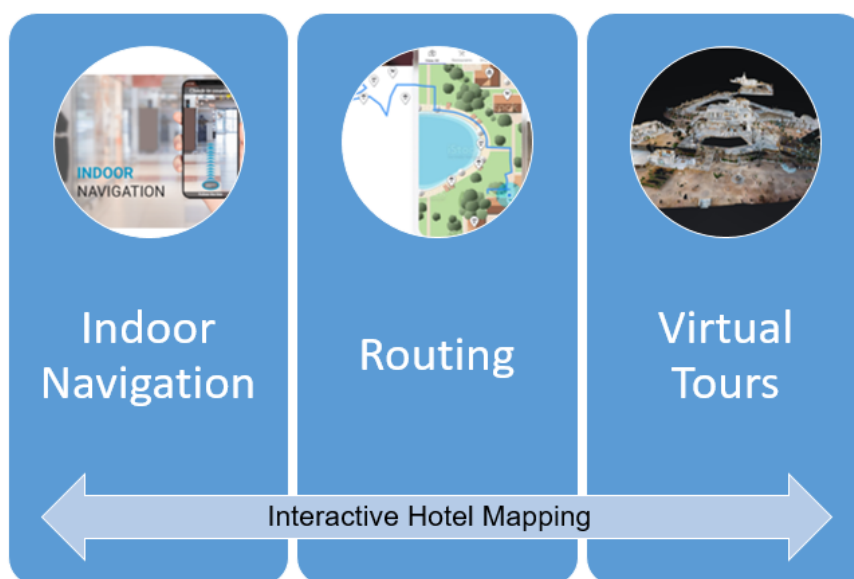


Figure 1. Components of the interactive hotel mapping technology

* Compiled by the authors

this visualization demonstrates the benefits of the intuitive navigation system and routing capabilities), and *Advant Technologies* (India) (Figure 2b shows a fragment of an advertising offer of this application; this visualization demonstrates the benefits of interactive overlay of digital components on a live picture of reality).

Now let's take a closer look at the components of interactive hotel mapping technology.

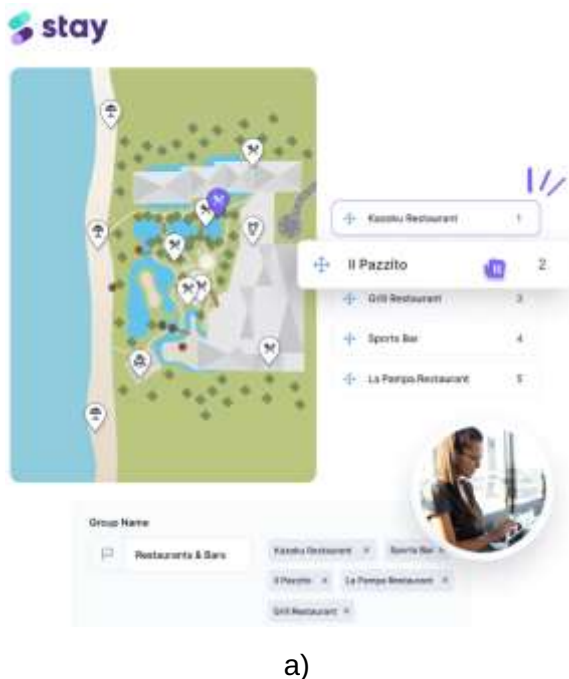
Indoor navigation allows hotels to offer personalized experiences using location-based services. Guests can receive targeted recommendations, promotions and information about current events or services based on their real-time location in the hotel. In case of emergency, indoor navigation plays a crucial role in ensuring the safety of guests and staff. Interactive maps can indicate clear evacuation routes and emergency exit locations, contributing to overall hotel safety. Hotels often cater to a diverse international clientele. Multilingual navigation helps to overcome language barriers and ensures that all guests are able to move around the property comfortably.

Hotels can use *indoor navigation* to enhance concierge services. Guests can easily find amenities such as restaurants, spas and fitness centers, making them more likely to explore and use these facilities during their stay. Due to the *positioning system*, users can easily book a table

in the hotel restaurant or cancel a reservation via the web interface. When a person comes to a cafe or restaurant, he or she does not have to look for a free place to have lunch or dinner. With the mobile app, he or she can easily find a reserved table or see available seats. Business owners get to control the occupancy rate of a restaurant or cafe. Detailed analytics allows them to reward loyal customers and give them bonus points for visiting the facility, as well as send promotional offers or restaurant news based on the guest's location in the hotel.

Integration of indoor navigation with Smart Room technology. By presenting indoor navigation and Smart Room technology in the same mobile app, this solution further enhances the guest experience. From customizing room settings to ordering room service, guests can control all these aspects of their stay at the touch of a button on their mobile devices.

Convenient *routing* (building the route from point A to point B) significantly saves guests time and effort, improving their experience. The interactive nature of virtual reality-based routing tools brings novelty, playfulness and entertainment to the route-taking experience. Guests may decide to search for routes to various sites even without feeling a particular need to visit these locations. Naturally, in this way, virtual reality-based routing technology



a)



b)

Figure 2 – Fragments of advertising offers of indoor virtual navigation applications:
(a) fragment of advertising offer *Stay App Hotel Map* (Spain) [7];
(b) fragment of advertising offer *Advant Technologies* (India) [8]

can significantly increase the attendance of relevant sites.

Virtual Tours provide customers with a way to explore a hotel (or any other recreational area) from the comfort of their own home. 3D 360° virtual tours of hotels and rooms are a practical application of virtual and augmented reality technology that can have a significant positive impact on the booking business process. In addition, virtual tours can act as a marketing tool to increase the interest and engagement of hotel guests. As an illustrative example of the technology under consideration, Figure 3 shows fragments of advertising for virtual tours of hotels by the company Vivestia (Greece).

Virtual reality technology allows customers to search for destinations, compare hotels and other accommodation options, and ultimately book rooms. At the booking stage, with the help

of a virtual reality headset, the customer can get a comprehensive impression of the hotel room they are about to book. This booking process is not yet widely adopted in the industry. However, those companies that have already tested the VR booking process have the unique opportunity to allow customers to explore virtual hotel rooms and get to know local attractions in advance.

Virtual tours provide potential guests with a realistic and detailed view of the hotel's facilities during the booking stage. This leads to a reduction in cancellations of previously booked rooms; a reduction in labor costs and time for preliminary room viewings at the check-in stage, reducing the need for personal excursions and site visits.

The business process of booking in modern hotels in the vast majority of cases is carried out with the involvement of online intermediaries.



Figure 3. Fragments of advertisements for virtual tours of hotels by the company Vivestia (Greece) [6]

On the hotel side, either the reservations department or the reception desk is a member of the booking logistics chain. As a conjugate logistic link, as a rule, travel agencies selling their services via the Internet (Online Travel Agency, OTA). OTAs are now part of the reservation supply chain of almost all hotels in the world [9]. The most famous OTAs are TripAdvisor, booking.com, Ctrip, hrs.com, expedia.com, hotels.com, Travelocity.com, orbitz.com, etc.

Thus, at the booking level, interactive hotel mapping technology should fulfil the requirements of the hospitality distribution market. And in this context, the main issue is possible overlaps and inconsistencies in location. This may occur when an OTA or travel agency receives information from two or more channels that use different identifiers and naming conventions. Based on this, the unification of identifiers is currently one of the most important tasks in interactive hotel mapping.

Conclusions. Interactive hotel mapping is an innovation that is a practical application of augmented reality technology in the tourism and hospitality industry. This technology is involved at all levels of digitalization and influences both the improvement of existing business processes and the emergence of new, innovative business processes and business models.

The components of interactive hotel mapping technology are: indoor navigation; routing; virtual tours.

Typically, IT products that support interactive hotel mapping technology tend to be more specialized than unified. This is mainly due to two circumstances: firstly, the desire to maintain the personalization of recreational interests through individualized design, and secondly, certain technical difficulties that do not allow

the effective use in indoor navigation of those positioning tools that are successfully used and well proven in outdoor navigation.

The most significant impact of the technology in question is on business processes related to marketing, booking, and front office service processes. Very good results and an improved guest experience can be achieved by integrating indoor navigation with *Smart Room* technology.

In general, we can conclude that the best results occur in the case of integrated application of innovative digital technologies in all business units and at all stages of the production cycle. Digital technology can significantly reduce costs and errors, help improve staff productivity and functionality, streamline processes and increase efficiency.

Scientific novelty of the study consists in specifying the prospects and features of implementation of specific realizations of the interactive hotel mapping technology in the context of improving business processes of the hospitality industry.

Practical significance of the obtained results lies in the possibility of their use in the activities of companies in the tourism and hospitality sector in order to increase the competitiveness and attractiveness of the services provided. The results of the study can also be used in the teaching of academic disciplines of professional orientation for students studying hotel and restaurant business, as well as tourism and recreation.

Prospects for further research may be related to clarify the trends of the impact of interactive hotel mapping technology on the business models of companies in the tourism and hospitality sector.

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