Comparison of Virtual and Augmented Reality in the Hotel Industry

Mr. Balakrishnan. R, M.Sc., (Ph.D.), Assistant Professor, Department of Hotel Management, TJohn college, Bengaluru. Email id: rbalahmct@gmail.com

Abstract

Planning a vacation, whether it be for business or pleasure, requires consideration of the hotel industry. The hotel sector has been introducing various technologies to gradually but progressively digitalize itself for a few years now. An illustration would be the use of digital keycards, which eliminate the need for visitors to visit the check-in counter altogether and allow them to enter their hotel rooms straight after receiving them on their mobile devices. These technologies have a significant impact on the processes and finances of the hotel as well as the guest's comfort by assisting in various decision-making processes. VR and AR are already being used in some small to medium-sized hotel companies, like Shangri-La and Marriott. In order to draw in more customers, the marketing division already uses VR and AR to some extent. More information about this example and other instances is provided below. This essay aims to investigate and evaluate the effects of virtual reality (VR) and augmented reality (AR) deployment in the hotel sector, both positive and bad. The author conducted an extensive study to help comprehend the big picture and to better understand the procedure for integrating VR and AR in the hotel business. It was surprising to see how little hotel guests knew about or utilized VR and AR. Nevertheless, the majority of participants supported the use of these technologies across the board in the hospitality sector.

Keywords: Hotel industry, VR & AR, technology, service, hospitality

1. Introduction

1.1 Presentation of the Problem

Virtual reality (VR) and augmented reality (AR) have become a significant part of today's technology. VR simulates an environment that can be accessed with the help of special glasses (Christodoulidou, 2020). AR uses the real world with the addition of information in the form of bubbles with texts or squares that pop up depending on the location (Gartner, 2022). The main difference is that one creates a completely new and simulated world, while the other uses the real world but with some additional components. Both technologies are mostly known for their entertainment aspects in the gaming industry. Yet, they are used in more sectors than anticipated, such as education, medicine, engineering, communication, and several others (Mathew, 2014). In 2021 the market size of VR reached 4.8 billion US dollars worldwide, with a strong increase from year to year, and is projected to reach over 12 billion US dollars by 2024 (Alsop, 2021a). Augmented reality, on the other hand, had a market size of 9.5 billion US dollars in 2021 and it is predicted to reach a total amount of almost 300 billion US dollars worldwide by 2024 (Alsop, 2021b). These numbers show shows that both AR and VR play a significant role in contemporary life. They are on the march of becoming indispensable constituents in every area of a human life's, including the tourism and hospitality industry, with a significant impact on those (Williams & Hobson, 1995).

According to Kutsenko (2019), both AR and VR can enhance the customer engagement in the hotel industry in numerous diverse ways if an implementation is to be lead through. Therefore, this implementation is encouraged and recommended, especially in the pre-booking phase where customers have many questions and insecurities about the accommodation and its facilities (Nayyar et

al., 2018). Even though AR and VR are widely used in different sectors like gaming; there is still limited research and information on how they could benefit the hotel industry. At the same time, it is also unknown, which challenges and benefits such an implementation could bring with itself. As stated by Tussyadiah et al. (2017) and Christodoulidou (2020), it has a bright future not only for the tourism industry but also for the hospitality industry and therefore for the hotel industry.

2 Literature review

2.1 Virtual reality
2.1.1 Definition of VR

According to Mandal (2013, p.304) virtual reality is defined as "a technology which allows a user to interact with a computer-simulated environment, whether that environment is a simulation of the real world or an imaginary world." This means that any given environment can be simulated, even a hotel and its facilities. Operators can intervene in different situations, depending on the user's movement, to adapt and customize the experience or even change the status from a bystander to a participant (Riva, 2006). This means that people can walk around, do house chores, and explore different surroundings and environments (Farshid et al., 2018).

2.1.2 Example uses of VR technology

Virtual Reality has become a usual tool in today's technology. Even though experts only saw the potential of VR in the gaming industry, throughout time, it became a significant tool in many different industries (Zobel et al., 2018). The planning and management area is one of the beneficiaries of the VR technology.A notable example of the use of VR technology is architectural planning, visualizing the space is an enormous advantage not only for the architect but also for the customer who is able to see the project beforehand and can intervene if there is something that he or she wants to change The education industry also benefits from the VR technology in several distinct aspects. For instance, the cultural institution, the Foundation of the Hellenic World, uses it to organize VR exhibitions.

2.1.3 Challenges and Benefits of VR in tourism

SWOT Analysis of VR Applications in Tourism

Strengths	Weaknesses	Opportunities	Threats
A powerful tool to enhance tourism	Limitations in technology	Protection of cultural and natural heritage sites	The lack of cultural interaction
A powerful promotional tool	Negative first impression	Sustainable tourism and environmental protection	Negative impact on real tourism and travel
Marketing tool for travel agencies/tour operators	Distance from real experience	Accessibility for disabled or elderly visitors	Economic impacts of real tourism in emerging economies or no high-tech destinations
Testing out products before going or purchasing	Lack of resident-tourist interactions	Time travel	Taxation of VR applications in the tourism industry
The ability to provide sensory experiences to customers	High cost for customers	Turning dreams into reality	Contributing to an anti-social process in society
To reduce the negative impacts of tourism	Physical and psychological disorders	Embody another being	Negative effects on other sectors related to tourism
Creating a destination attraction	Ambiguity about tourism policy and planning	Design without limitations	Negative effect on employment in tourism and related sectors
Embody knowledge	Impossibility of souvenir purchasing	Achieve the impossible	Virtual travel/ tourism acceptance and accessibility
Allowing the exploration of each destination in great depth	The lack of definitions for tourists	Be fearless/ removing bureaucratic, security and language problems for visitors	Monopolization or non-competition between tour operators
Positive cost effects for tourism businesses	The lack of a conceptual framework	Alternative tourism experiences such as e-sporting events	Other legal issues

Table 1 - SWOT Analysis of VR Applications in Tourism

On the other hand, there are also a lot of benefits that come with the VR technology. As specified by Dilek et al. (2018) in the table above, VR could be a great marketing tool for the hospitality industry to promote their hotels and the destinations. This can help customers visualize their potential trip and accommodation before genuinely traveling to the destination and, if necessary, changes and adjustments can be made (Rainoldi et al., 2018).

2.1.4 The usage of VR in hotels

VR in the hotel industry comes with many benefits and advantages. Nowadays, many hotels offer on their websites VR tours of their properties to attract more customers as they are considered more appealing than traditional advertisements (Wan et al.,2007). Moreover, VR can help the tourist overcome the fear of uncertainty and lack of knowledge about the trip as well as the destination and accommodation (Lee & Oh, 2007). In addition to overcoming anxiety, VR can be a valuable tool when it comes to planning the trip. It not only helps to find an adequate accommodation, but it can also
help with the choice of destination and tourist attractions (Pestek & Sarvan, 2021).

2.2 Augmented reality

2.2.1 Definition of AR

Springer Science+Business Media (n.d.) defines Augmented reality as "a system that enhances the real world by superimposing computer-generated information on top of it." It uses artificial information such as visual and audiovisual elements to focus on various aspects of the real world and provide more information when pointed upon one of these aspects. Contrary to VR, the user is still able to see the real world but with an addition of information (Hayes, 2020). Usually, AR does not require more than a smartphone (hardware), which should have a camera and a mobile application (software) to be used (Porter & Heppelmann, 2017). So, everyone who owns a smartphone could use augmented reality.

2.2.2 Example uses of AR technology

Augmented Reality is used a lot nowadays, even more than it might be imagined. For instance, one of the many industries in which AR is to be found and used is the education industry. The ability to visualize information in three-dimensional space (3D) or to compare different perspectives at the same time makes users acquire the information faster and easier. Moreover, it improves the learner's motivation and performance (Hincapie et al., 2021). According to Cranmer et. al. (2020), their study showed that Augmented Reality enriches the customer experience in several ways.

2.2.3 The usage of AR in hotels

For the tourism industry AR has been nothing but beneficial. It gives travelers the opportunity to discover new places with a novel and exciting approach (Cranmer et al., 2020). As an example, the rooms at the Hub Hotels by Premier Inn were designed with a city map where visitors can point their smartphones at. With the help of their app, the guests are then provided with all the tourist hotspots and sights around the hotel (Bogomolov, 2019). The guests can access information about the distance to the
point of interest, opening hours, prices, or even the occupancy rates. Another example is the Casa Madrona, which implemented an AR-supported brochure so its customers can check out the hotel property and its facilities prior to their stay as well as during their stay (Augmented reality in NYC: Casa Madrona Hotel & Spa, 2015).

3 The difference between VR and AR

The main difference between VR and AR is that the first one is entirely based on an artificial environment, while the second one is combining the real world with some computerized information (Farshid et al., 2018). The graphical elements are much intricate in the virtual reality than in the augmented reality. AR uses templates, text boxes and simple frames, while for VR a whole software needs to be carefully programed (Caudell, 1995). In addition, for VR you need special gear to have the full experience such as headsets and goggles, while AR can be used directly on the mobile phone

or tablet. Augmented reality focuses more on customers, while virtual reality can also be considered by businesses or institutions such as universities, for marketing aims or educational purposes.

3.1 The perception and potential of using and implementing VR and AR in the hotel industry

Already in the early days, using this technology to virtually visit sights like theme parks was very popular and well perceived because the idea of being able to fully customise your journey was something extraordinary (Williams & Hobson, 1995). Huang et al. (2013b) state in their article that results of their research show a positive response from the participants regarding the usage of virtual tourism websites. Moreover, the respondents also showed a positive interest in the usefulness of such sites and emotions such as joy or even excitement. With the help of the Technology Acceptance Model, also known as TAM, researchers can determine the acceptance of users for new emerging technologies. The findings of the research made by Israel et al. (2019). undoubtedly demonstrate that the perceived usefulness is a key factor that beneficially impacts the attitude in the direction of using it in the first place and utilizing the technology more. Therefore, it can be concluded that people are open to using new technologies such as virtual reality and augmented reality, especially when it eases their life and makes day-to-day activities more time and energy efficient. Yet, before being able to form an opinion on whether the technology has a good perceived ease of use, humans must be open to the use of these new technologies, namely VR and AR.

For the further proceedings, a descriptive analysis of the newly computed variables is done. This is relevant for the understanding of the following analyses. Moreover, it is important to have a picture and idea about some general information like mean or normality about the computed variables. The following table shows the descriptive data about the computed variables from the perspective of a hotel manager.

Descriptives

	HM VR Usefulness	HM AR Usefulness	HM VR Efficiency	HM AR Efficiency	HM Do You Think
N	77	79	81	76	40
Missing	11	9	7	12	48
Mean	3.87	3.97	3.75	3.70	3.72
Median	4.00	4.00	3.83	3.83	3.67
Standard deviation	0.984	0.852	0.856	0.958	1.26
Minimum	1.00	1.00	1.00	1.00	1.00
Maximum	5.00	5.00	5.00	5.00	5.00
Skewness	-1.58	-1.21	-0.858	-0.803	-0.717
Std. error skewness	0.274	0.271	0.267	0.276	0.374
Kurtosis	2.26	1.83	1.37	0.529	-0.392
Std. error kurtosis	0.541	0.535	0.529	0.545	0.733
Shapiro-Wilk W	0.827	0.898	0.935	0.937	0.862
Shapiro-Wilk p	<.001	<.001	<.001	<.001	<.001

Table 5 - Descriptive Data of Computed Variables Hotel Manager (HM)

4. Conclusion

This research has great implications for the future of the hotel industry and the implementation of VR and AR in this industry. Augmented reality and virtual reality are currently a very discussed topic, and more and more hotels are adopting these technologies, which shows the importance of this research. The thesis provides insight into a topic that has not yet been fully investigated and analyzed. Therefore, some research was made, and the results will further help the hotels by easing up the decision-making process about the implementation of VR and AR. The main goal was to identify the challenges and benefits that such an implementation brings. By weighing the challenges and the benefits of such an implementation, the hotels can then decide whether they think that these technologies could be a useful and efficient tool for their premises. This research provides a better overview of the participants involved in this process and the effects it has on the users, both hotels and guests. The analysis has shown positive results for the implementation of the researched technologies, with both hotel managers and hotel guests being open towards such a technological change. Even though they were not fully aware of these technologies already being used in the hotel industry, they perceive both VR and AR as useful tools not only for the hotels and their employees but also for the guests. Yet also many challenges were identified and observed. Nevertheless, those challenges are possible to overcome and it is up to every hotel to decide whether they consider implementing VR and AR.

References

1. Alsop, T. (2021a). Virtual reality (VR) – statistics & facts. Statista. Retrieved December 9, 2021, from https://www.statista.com/topics/2532/virtualreality-vr/.

2. Alsop, T. (2021b). Augmented reality (AR) - statistics & facts. Statista. Retrieved 2021, from https://www.statista.com/statistics/591181/globalaugmented-virtual-reality-market-size/.

3. Amadeus. (2017). *The world's first Virtual Reality travel search and booking experience*. YouTube. Retrieved March 25, 2022, from https://www.youtube.com/watch?v=Ax0BmO3DrTc&t=29s

4. Bogicevic, V., Liu, S. Q., Seo, S., Kandampully, J., & Rudd, N. A. (2021). Virtual reality is so cool! how technology innovativeness shapes consumer responses to service preview modes. *International Journal of Hospitality Management*, 93.

5. Bogomolov, V. (2019, March 14). Top 5 ideas how to use AR in tourism.Hospitality Net. Retrieved November 14, 2021, from https://www.hospitalitynet.org/opinion/4092421.html.

6. Camilleri, M. A. (2018). Travel Marketing, Tourism Economics and the airline product. *Tourism, Hospitality & Event Management*. https://doi.org/10.1007/978-3-319-49849-2

7. Christodoulidou, N. (2020). *Virtual reality and its possibilities for hospitality*. Hospitality Technology. Retrieved December 9, 2021, from https://hospitalitytech.com/virtual-reality-and-its-possibilitieshospitality

8. Cranmer, E. E., tom Dieck, M. C., & Fountoulaki, P. (2020). Exploring the value of augmented reality for Tourism. *Tourism Management Perspectives*, 35. https://doi.org/10.1016/j.tmp.2020.100672

9. CSAE. (2022). Smart Light Beam - Lichtgeführte Mitarbeiter- Unterstützung.CSAE GmbH. Retrieved May 16, 2022, from https://www.csae.de/arbeitsablaeufe-optimieren/

10. Dilek, N. K., Kızılırmak, I., & Dilek, S. E. (2018). Virtual Reality or just reality? A SWOT analysis of the tourism industry. ResearchGate. Retrieved November 22, 2021.

11. Egger, R. (2017). VR-the future of Selling Hotel Rooms. Virtual Reality in Tourism. Retrieved March 16, 2022, from http://www.virtual-reality-intourism.