Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVII, vol. 57, no. 4spl, 2024, p.1974-1979
DOI 10.30892/gtg.574spl11-1364

INNOVATIVE CHANGES IN HISTORICAL TOURISM OBJECTS IN THE CONTEXT OF THE NEED FOR THE IMPLEMENTATION OF DIGITAL TOOLS

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Citation: Šaffová, I., Matušíková, D., & Vargová, T.D. (2024). INNOVATIVE CHANGES IN HISTORICAL TOURISM OBJECTS IN THE CONTEXT OF THE NEED FOR THE IMPLEMENTATION OF DIGITAL TOOLS. *Geojournal of Tourism and Geosites*, 57(4spl), 1974–1979. https://doi.org/10.30892/gtg.574spl11-1364

Abstract: The digital revolution is also evident in the tourism industry. Its use is becoming more and more massive and does not bypass any of the services provided to its participants in tourism. Virtual reality is a powerful tool that can play a significant role in the tourism industry. In approximating the historical potential, it is an ideal helper for displaying what cannot be fully returned to under the influence of time. The paper discusses digital advancement in tourism at an example of analyzing the public's interest in applying virtual reality to services in historical objects (castles, manor houses, museums, etc.). As part of the study, questionnaire research was carried out on a research sample of visitors to historical objects in the Slovak Republic. Its results are described in more detail using several methods of advanced statistics such as Kruskal-Wallis test, Spearman's correlation coefficient, normality test and others. The results of the research show that virtual reality as a modern digital tool that is perceived as a highly beneficial element for innovating the services of historical objects. Through it, the product portfolio expands and the experience increases. This indicates the justification for its further expansion into historical tourism objects in the country.

Keywords: tourism market, virtual reality, digitization, digital innovation

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INTRODUCTION

The tourism sector has undergone many changes in recent years, mainly caused by the coronavirus pandemic. This situation has led to a paradigm shift in processes and operations through the integration of advanced technologies such as artificial intelligence or virtual reality (Popșa, 2023). Digitization initiatives in this sector have also accelerated in line with technological developments, increased pressure on costs and productivity and higher customer expectations (Hollander, 2022). Innovation and digitization are som ein of the key challenges, together with monitoring of developments in demand, health and hygiene, sustainability or recommendations for the application of tourism policies. In the context of digitization and innovation, attention is drawn to the growing need for digital adoption and the application of contactless technologies as a prerequisite for safe and seamless travel (World Travel & Tourism Council – WTTC 2020). Tourism was one of the first sectors to digitize processes on a global scale. The digital tourism sector must innovate and create new business opportunities to ensure its continued competitiveness, growth and sustainable development (United Nations World Tourism Organization – UNWTO 2021). Digitization in tourism makes tourism more flexible, adapted to modern conditions and competitive in a dynamic digital world. It has proved to be a fundamental necessity for the aforementioned tourism, a sector which generally favours human interaction and personalised experience. The complex application of new technologies in the tourism sector brings with it a special operating mode, efficient implementation tools and high-quality value creation that has opened a new path for the development of a global economic format (Chaw et al., 2019).

Digitization is expected to continue to drive traveller experiences along its trajectory towards a smoother, more seamless and high-quality service. The use of different types of technology has led to a supply of tourism that is more attractive, more efficient, more inclusive and more economical, socially and environmentally sustainable than its predecessor. It has also facilitated innovation and the re-evaluation of processes to address issues such as seasonality and population density and to develop smarter destinations. Digitization has a positive impact on the environment and can have an even greater impact, while innovation in production, smart assets and resource efficiency contribute to a more sustainable industrial footprint (United Nations World Tourism Organization – UNWTO 2021). Various digital technologies are widely recognised as valuable sources of competitive advantage (Busulwa et al., 2022). The advent of the digital age and the increasing growth of

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information and communication technologies, like all businesses and activities, have revolutionized the tourism sector (Hassani and Bastenegar, 2020). Technology allows an unprecedented new and interactive regime for the dissemination of information. One of the technological advances that are gaining momentum and popularity is, for example, virtual reality (Kusumah et al., 2022). Identified trends in tourism industry are found in effective planning and suitable management. As the almost-realistic, easy and detailed navigations created through the VR are readily available for tourists to help in their trip- and activity-planning processes, its potential is further widened (Tussyadiah et al., 2018). Virtual travel can be used in tourism in a variety of ways. Product policy must progress (Pethö et al., 2021) and thus the technology is developing rapidly and, together with the technology, the possibilities for exploiting it are expanding (Immervision, 2023).

THEORETICAL BACKGROUND

Virtual reality as a digital innovation in the travel market

Virtual reality offers a global approach to consumers and not only enables service providers to improve the development of the tourism sector and its competitive standards. It is precisely this digital trend to change the way we travel, to reduce the environmental burden on the tourism industry and to bring various benefits to it. Digital technologies, including virtual reality, can help developing economies to overcome conventional challenges. In the area of managing destinations and increasing their competitiveness. However, many development destinations have limited knowledge of how to take advantage of virtual reality and mitigate risks. Either they are limited by a lack of understanding or know-how and resources, these economies are unable to use digital tools to develop tourism (The World Bank, 2018).

The authors of Kusumah et al. (2022), for example, perceive virtual reality as a way of encouraging travellers to return to tourism and visit specific destinations. According to the authors Yung and Khoo-Lattimore (2019) can be a virtual reality characterized as a simulated experience that is either identical or diametrically different to the real world. Virtual reality is currently being used to improve the experience of travellers, to provide destinations, attractions and businesses with other marketing tools, to reshape the experience of consumers and to create a new tourism model. On the basis of the findings so far, the company has adapted to digital trends (including virtual reality) during the journey. In addition, related technologies and applications are developing rapidly. It is therefore necessary to gather, synthesize and present all new knowledge on this subject for researchers and practitioners (Calisto et al., 2024).

Kusumah et al. (2022) determine whether the image of the destination and the purpose of the re-visit are influenced by the experience of virtual reality. Their results showed that the image of the destination could convey the impact of the virtual reality experience on the purpose of the re-visit. The potential of virtual reality to improve the experience of travelling. It has grown by leaps and bounds, especially during a pandemic, because tourism enterprises of whatever nature, attractions and destinations were forced to adopt technology in ways they had never tried before. In general, virtual reality in tourism can be used to capture tourist destinations in a unique way (Dauk, 2022). Rauscher et al. (2021) state that when appropriately implemented, the given technology can not only be beneficial in reducing visitor concentrations at tourist hotspots or mitigating the negative impacts associated with frequent travel but could also be applied to locations where physical visitor engagement is not feasible due to their remoteness, high cost, or inaccessibility.

The ability to capture tourist destinations in such an unforgettable and absorbing way is also a powerful marketing tool. The finished content can then be viewed either on a virtual reality set placed, as a rule, on the head of a tourist or a normal computer or mobile device (Immervision, 2023). The research carried out under Australian conditions has also yielded many interesting conclusions, namely that virtual reality brings life to the goal and can force consumers to consider travelling to places they would not otherwise have considered. Consumers are most interested in content related to virtual reality and nature or wildlife, water and coastal offerings. The incentive to travel to the destinations listed in the virtual reality assets was generally high, with a strong potential to inspire and motivate the likelihood of a site visit.

Virtual reality technology is certain to advance, as will opportunities within the tourism sector. Regardless of the direction these advancements and developments take, various applications and trends have already been identified and are being utilized in the tourism industry (Pestek et al., 2021). Almost a fifth of consumers have used virtual reality to help them choose their holidays. Around 25 % of consumers said they plan to use it in the future to help them decide on a holiday destination (Tourism Australia, 2023). It argues that virtual travel plays an important role in the selection and planning process. This digital trend could make travel easier for potential consumers. It also provides a great opportunity to visit hard-to-reach places (Mehrbakhsh et al., 2018). For this reason, the aim of the study was to find out through research questions:

RQ1 - Does the public perceive digital tools at the example of virtual reality as an important part of service delivery innovation in historical tourism objects?

RQ2 - Does the implementation of digital tools, using the example of virtual reality, affect the decision-making of the respondents visiting the historical objects of tourism?

RQ3 - Which elements of the product section are the most popular for the use of virtual reality?

MATERIALS AND METHODS

The aim of the contribution is to find out the public's attitude towards the use of digital tools at the example of the application of virtual reality in historical objects as an important part of tourism.

Several research methods were chosen to achieve the chosen goal in connection with the application of virtual reality in historical tourism objects. Questionnaire research was the main method used to obtain quantitative data. Its main attention was devoted to the use of digital innovations in historical objects at the concrete example of virtual reality. The main goal of the questionnaire research was to provide quantitative data at the example of the Slovak public, who visits

historical objects and has knowledge of virtual reality and its possibilities. The design of the questionnaire was implemented in three levels. The first level monitored opinions on the perception of virtual reality in historical objects as an important part of service provision and thus reflected on research question no. 1. The second level aimed at finding out whether the implementation of virtual reality in historical objects can stimulate a higher interest in visiting such objects, and therefore fulfilled research question no. 3. The last level looked at specific examples of the application of virtual reality, where the public would appreciate it the most. 4 basic components were selected, which are most often associated with historical objects. From the point of view of the variables, the gender of the respondents was selected, on the basis of which the differences in perception were analysed. Mathematical and statistical methods were used to evaluate the results of the implemented questionnaire. Primary data processing was carried out in MS Excel.

For the purpose of evaluating the perception of virtual reality as a digital innovation in the historical objects within the tourism industry, the Shapiro-Wilk test was used to determine the distribution of respondents. For hypothesis testing, non-parametric tests were chosen, namely the Kruskal-Wallis test, Spearman's correlation coefficient. Questionnaire research was carried out in the months of June to August 2024 in a personal way of distribution and addressing respondents during a visit in historical objects. The questionnaire contained scaled questions in which the respondents could express their opinion, or their perception based on the stated statement. The scaled questions of the questionnaire were in the form of a 5-point Likert scale (wording of the 5-point scale: definitely agree; rather agree; neither agree nor disagree; rather disagree; definitely disagree), which is a suitable means for measuring the perception, opinions or attitude of the respondents. For the purposes of this contribution, partial results of the questionnaire survey were selected. Subsequently, a method of comparison was used, which compared the results of the survey from the point of view of the gender variable of the respondents. The object of the survey was the domestic public, which participates in tourism and the use of its services in domestic tourism as well as foreign passive ones.

The research sample as mentioned before consisted of the visitors of historical objects in the tourism field coming from the Slovak Republic. All the respondents were questioned during their visit to these objects located in the territory of the country. For the purpose of the study, 3 hypotheses were stated:

H1: There is an assumption, that there exists a difference in the public perception of the digital tools at the example of virtual reality as an important part of service delivery innovation in historical tourism objects.

H2: There is an assumption, that the implementation of digital tools, using the example of virtual reality, affect the decision-making of the respondents visiting the historical objects of tourism.

H3: There is an assumption, that is difference in the perception of concrete products of virtual reality used in historical objects.

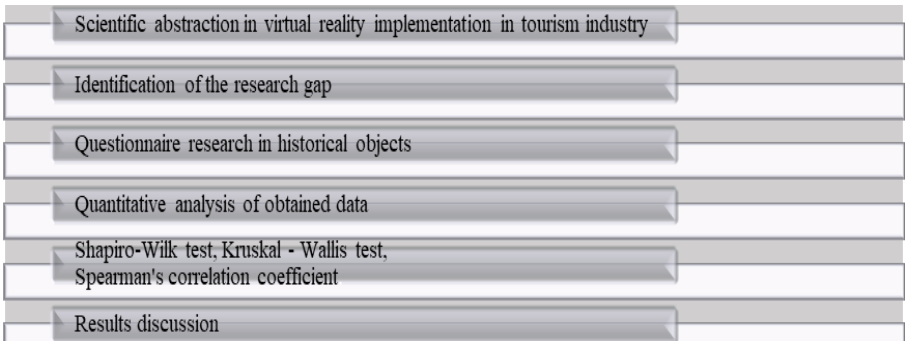

Figure 1. Methodology flowchart

RESULTS AND DISCUSSION

The results of the perception of virtual reality as an important innovation in historical objects in the tourism market

When characterizing the research sample (Table 1) in terms of the gender of the respondents, the dominant part was made up of female respondents (16.8 % more than males). In terms of age, the youngest respondent was 16 years old, the oldest respondent was 64 years old. The average age of respondents was 27 years old. In terms of place of residence, the "city" was dominated by women. In the case of rural settlements, the ratio was almost balanced for both genders. The descriptive statistic is provided in Table 1 below.

Table 1. Respondents distribution according to the gender and place of residence (Source: Own processing)

Variable	Frequency	Cumulative Frequency	Relative frequency %	Cumulative relative frequency %
Gender				
Men	92	92	41.60%	41.60%
Women	129	221	58.40%	100%
Residence				
City				
Men	44	44	34.10%	34.10%
Women	85	129	65.90%	100%
Countryside				
Men	48	48	52.18%	52.18%
Women	44	92	47.82%	100%

Table 2. Descriptive statistics and normality of the independent variable - respondents' gender (Source: Own processing)

N	Gender
Median	221
Standard deviation	1
Shapiro-Wilk W	0.496
Shapiro-Wilk p	0.629
	< .001

Table 3. The use of virtual reality in historical tourism objects is an essential means of service innovation (Source: Own processing)

N	221
Average	1.76
Median	1
Sum	389
Standard deviation	1
Minimum	1
Maximum	4
Shapiro-Wilk W	0.739
Shapiro-Wilk p	< 0.01

Table 4. The use of virtual reality in historical tourism objects increases their competitiveness (Source: Own processing)

N	221
Average	1.48
Median	1
Sum	327
Standard deviation	0.892
Minimum	1
Maximum	7
Shapiro-Wilk W	0.597
Shapiro-Wilk p	< 0.01

Table 5. The use of virtual reality in historical tourism objects increases the motivation to visit these objects (Source: Own processing)

N	221
Average	1.84
Median	1
Sum	407
Standard deviation	1.05
Minimum	0
Maximum	4
Shapiro-Wilk W	0.773
Shapiro-Wilk p	< 0.01

Table 6. The use of virtual reality in historical tourism objects is an important educational tool (Source: Own processing)

N	221
Average	1.62
Median	1
Sum	359
Standard deviation	0.99
Minimum	1
Maximum	5
Shapiro-Wilk W	0.667
Shapiro-Wilk p	< 0.01

Table 7. The use of virtual reality in historical tourism objects is an essential means of service innovation (Source: Own processing)

N	221
Average	1.72
Median	1
Sum	380
Standard deviation	0.978
Minimum	1
Maximum	4
Shapiro-Wilk W	0.727
Shapiro-Wilk p	< 0.01

Based on the Shapiro-Wilk test, we can conclude that the data do not have a normal distribution, the p values are lower than 0.05 (Table 2). The first part of the questionnaire was dedicated to the research question, whether the public perceive digital tools at the example of virtual reality as an important part of service delivery innovation in historical tourism objects. 5 concrete statements were proposed to the respondents, where they could express their opinion in the use of virtual reality. On the basis of descriptive statistics, the perception of virtual reality in historical objects can be evaluated as follows: AP values in individual items range from 0.597 to 0.773 (Table 3 - 7), therefore we can conclude that the values for the positivity of virtual reality are at the level of 1-2 (agree-rather agree), which we can consider it a positive finding in this area. According to the Shapiro-Wilk test, the data do not have a normal distribution, the p-value is lower than 0.05 in all items. We reject normality and choose non-parametric tests for testing, namely the Kruskal-Wallis test, Spearman's correlation coefficient, which are listed below. According to the results, the implementation of virtual reality in historical object is dominantly perceived the most as a tool to increase the competitiveness of historical objects. On the next position, as a significant positive benefit of the virtual reality can be its education asset. The lowest value was recorded in the case of the motivation tool for a future visit. Despite the fact that the value was the lowest, the resulting value was at the level of rather agree, that is, still within the limits of a positive perception of the tool. The second part of the study aimed to find out, if the implementation of digital tools, using the example of virtual reality can affect the decision-making of the respondents visiting the historical objects of tourism (Table 8 - 11). In this case too, the results were comparable to the first part. Respondents perceive virtual reality as a positive and beneficial tool that can positively influence their perception.

Table 8. The use of virtual reality in historical tourism objects affects my decision to visit a historical object (Source: Own processing)

N	221
Average	1.81
Median	1
Sum	401
Standard deviation	1.08
Minimum	1
Maximum	5
Shapiro-Wilk W	0.786
Shapiro-Wilk p	< 0.01

Table 9. The use of virtual reality in historical tourism objects intensifies my experiences of visiting a historical object

N	221
Average	1.647
Median	1
Sum	363
Standard deviation	0.916
Minimum	1
Maximum	5
Shapiro-Wilk W	0.79
Shapiro-Wilk p	< 0.01

Table 10. The use of virtual reality in historical tourism objects stimulates the rate of absorption of information about historical objects (Source: Own processing)

N	221
Average	1.77
Median	1
Sum	391
Standard deviation	0.916
Minimum	1
Maximum	5
Shapiro-Wilk W	0.705
Shapiro-Wilk p	< 0.01

Table 11. The use of virtual reality in historical tourism objects increases my satisfaction with the services provided (Source: Own processing)

N	221
Average	1.98
Median	2
Sum	437
Standard deviation	1.11
Minimum	1
Maximum	5
Shapiro-Wilk W	0.779
Shapiro-Wilk p	< 0.01

The results show that the most significant impact virtual reality leaves in the case of stimulating the rate of absorption of information about historical objects and as an intensifier of the experiences of visitors in historical objects.

The last part of the questionnaire was focused on finding out, which elements of the product section are is the most popular for the use of virtual reality. There were 4 supporting categories, namely: significant personalities and their portrayal through the medium of virtual reality. The second element was significant events and the possibility of entering their plot within virtual reality. The third element was objects and buildings that would also support augmented reality and would display individual objects virtually in their original version. The last element was tools, implements and utensils that could be tried out through virtual reality. As can be seen in Table 12, the most popular products, where virtual reality is expected to be attractive the most are the historical objects and buildings. The second most popular was the potential meeting with famous historical personalities. Participation in historical events was the third one and on the last place, as the less attractive was the possibility of the use of historical tools.

Table 12. Attractivity of virtual reality in historical tourism objects in concrete products portfolio (Source: Own processing)

Categories	**Frequency**	**Cumulative frequency**	**Relative frequency**	**Cumulative relative frequency**
Famous historical personalities	67	67	30.32%	30.32%
Significant historical events	45	112	20.36%	50.68%
Historical objects and buildings	89	201	40.27%	90.95%
Tools, implements and utensils	20	221	9.05%	100%

Hypotheses evaluation

There is an assumption, that there exists a difference in the public perception of the digital tools at the example of virtual reality as an important part of service delivery innovation in historical tourism objects according to the gender of respondents. There was and an expectation that men will perceive technology more positively than women, which was confirmed.

H2: There is an assumption, that the implementation of digital tools, using the example of virtual reality, affect the decision-making of the respondents visiting the historical objects of tourism.

Based on the results of the Kruskal-Wallis test, it can be concluded that in all cases statistically significant differences between gender and the perception of virtual reality and its contribution to historical objects in tourism were confirmed. The p-values were lower than 0.05 and thus H2 can be confirmed.

H3: There is an assumption, that is difference in the perception of concrete products of virtual reality used in historical objects. The hypothesis was not confirmed only in the first case of famous historical personalities.

Table 13. Verification of the Hypothesis 1 (Source: Own processing)

	χ^2	df	p
Q1- mean of innovation	15.4	1	< 0.01
Q2- competitiveness enhancer	4.97	1	0.026
Q3- motivation factor	18.38	1	< 0.01
Q4- educational factor	10.39	1	0.001
Q5- service progression tool	11.41	1	< 0.01

Table 14. Verification of the Hypothesis 2 (Source: Own processing)

	χ^2	df	p
Q1- mean of innovation	6.64	1	< 0.01
Q2- competitiveness enhancer	10.93	1	<0.01
Q3- motivation factor	7.91	1	0.005
Q4- service progression tool	15.69	1	< 0.01

Table 15. Verification of the Hypothesis 3 (Source: Own processing)

	χ^2	df	p
Q1- Famous historical personalities	3.18423	1	0.074
Q2- Significant historical events	0.32558	1	0.568
Q3- Historical objects and buildings	0.04281	1	0.836
Q4- Tools, implements and utensils	0.51161	1	0.474

CONCLUSION

In conclusion, it can be assessed that today's modern digital age makes significant use of the implementation of digital technologies in tourism services, which can bring many advantages. One of the digital innovations in the industry is virtual reality, which gained importance with the advent of the pandemic period.

By using virtual reality, visitors to historical buildings can experience key elements and interesting things from history. As stated by author Richardson (2024) that historical objects use virtual reality to enhance visitor experiences by providing immersive, interactive exhibits. The situation within Slovak republic by providing digital services in historical sights, is in progress. He also mentions, that virtual reality allows for exploration of historical sites, distant cultures, and intricate details of artefacts that might be inaccessible in physical form. It also engages diverse audiences and can bring history and art to life in innovative ways. This opinion was confirmed also by Slovak visitors of such sights.

Author Contributions: Conceptualization, D.M and I.Š.; methodology, D.M. and I.Š.; software, T.D.V. and D.M.; validation, I.Š. and D.M.; formal analysis, T.D.V. and I.Š.; investigation, I.Š., D.M. and T.D.V.; data curation, D.M. and T.D.V; writing - original draft preparation, I. Š, T.D.V. and D.M.; writing - review and editing, T.D.V, D.M. and. I.Š. visualization, D.M.; supervision, I.Š and D.M.; I.Š. project administration I.Š. All authors have read and agreed to the published version of the manuscript.

Funding: GaPU 16/2024.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgements: The paper is a part of the output of the projects: GaPU 16/2024. Digitálne napredovanie historických objektov cestovnom ruchu a potreba implementácie digitálnych nástrojov do ich chodu (Digital advancement of historical tourism objects and the need to implement digital tools in their operation), Grant agency of University of Prešov in Prešov.

Conflicts of Interest: The authors declare no conflict of interest.

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Article history: Received: 26.08.2024 Revised: 20.10.2024 Accepted: 28.11.2024 Available online: 31.12.2024