Almir PEŠTEK*
Maida SARVAN**

PUTOVANJE PRIJE PUTOVANJA: MARKETING VIRTUALNE STVARNOSTI ZA PODRŠKU VEĆE ODRŽIVOSTI TURIZMA

TRAVELING BEFORE TRAVELING: VIRTUAL REALITY MARKETING IN SUPPORT OF GREATER TOURISM SUSTAINABILITY

SAŽETAK: Ovaj članak istražuje odnos između informacijske i komunikacijske tehnologije (ICT) i virtualne stvarnosti (VR) s jedne strane i turizma s druge, odnosno njihove međuodnose i poveznice s održivošću turizma. Kao potrošačka tehnologija, VR je još uvijek relativno novi koncept premda se istraživala i koristila u turizmu za marketinške svrhe. Cilj je protumačiti različite aspekte VR-a i ICT-a kako bi se potencijalno povezali s održivošću i perspektivama masovnog turizma kao i s potencijalnim budućim razvojima koji se odnose na potencijal ICT-a i turizma za što veće ispunjavanje potreba turista u budućnosti. Saznanja o ovim konceptima i njihovim međusobnim odnosima stečena su upotrebom metodologije sustavnog mapiranja. Studija otkriva evaluciju i veze između istraživanih koncepata, postojeće izazove i rješenja, kao i preostale nedostatke. Ovi nalazi ukazuju na činjenicu da VR kao trend u turizmu još uvijek zahtijeva značajnu količinu rada i poboljšanja kako bi mu se mogla potpuno posvetiti te posebno uključiti u pitanja turizma i potencijala koncepta održivosti u tom sustavu. Unatoč mnogim bojaznima i nesuglasicama, potencijal njezine ispravne provedbe je ogroman.

KEY WORDS: virtualna realnost, turizam, održivost, marketing, razvoj

ABSTRACT: This paper investigates the relationship of information communication technology (ICT) and virtual reality (VR), and tourism, or specifically its interrelations and links to tourism sustainability. As a consumer technology, VR is still a relatively new concept, although it has been researched and used in the tourism industry for marketing purposes. The aim is to understand the different aspects of VR and ICTs and potentially link them to sustainability and perspectives on mass tourism, as well as to the potential future developments related to the ability of ICT and tourism to meet the tourists' needs to a greater extent in the future. By use of the systematic mapping methodology, the insights into these concepts and their relations to each other are provided. The study reveals the evolution and links between the investigated concepts, the existing challenges and solutions, and the remaining gaps. The present findings indicate that VR as a trend in the tourism industry still needs significant work and improvement until it is ready to fully immerse itself into the tourism sector and especially involve itself into the issues concerning tourism and the potential of sustainability concept within the industry. Many of the concerns and conflicts still exist, but the potential of its right implementation is enormous.

KEY WORDS: virtual reality, tourism, sustainability, marketing, development

*   Professor Almir Peštek, University of Sarajevo, School of Economics and Business in Sarajevo, Bosnia and Herzegovina, e-mail: almir.pestek@efsa.unsa.ba

**   Maida Savan, MA, NLB Bank d.d., Sarajevo, Bosnia and Herzegovina, e-mail: maida.sarvan@nlb.ba

1. UVOD

Ovaj članak bavi se istraživanjem mogućnosti spoja virtualne stvarnosti (VR) i stvarnosti kako bi turizam bio održiviji, kao i propitivanjem vjerojatnosti da bi turističko iskustvo moglo sve više postati takav spoj kako bi što prikladnije zadovoljili zahtjeve održivosti. Točnije, ispituju se učinci VR-a na potrošače prije nego što i počnu planirati svoj odmor i to tako da identificiraju glavne afektivne i kognitivne odgovore kao značajne posrednike u predviđanju privrženosti, postupaka odlučivanja i namjera putovanja.

Spomenute žarišne točke istraživane su u pregledu literature koja obuhvaća bitne konstrukte: VR, ponašanje potrošača i održivost u turizmu. Radi boljeg razumijevanja ovih koncepata od najveće je važnosti provesti taj pregled, a postupak sustavnog mapiranja ove studije otkriva nedostatke u znanju i popunjava ih pojedinostima veza između koncepata. Članak je strukturiran na sljedeći način: prvo se daje uvid u teorijski okvir u kojem se utvrđuje što je poznato, a što nije u istraživanom području; zatim se definiraju ciljevi i istraživačka pitanja; obrađuju se dizajn istraživanja i strategija pretraživanja; prezentiraju se rezultati i rasprava; i konačno, rad završava zaključkom, ograničenjima i preporukama za buduća istraživanja.

2. TEORIJSKI OKVIR

2.1. Marketing turističke destinacije temeljen na tehnologiji: potencijal virtualne stvarnosti

Postoje očite nesukladnosti u pokušajima definiranja VR-a zbog nedosljednosti u obilježavanju različitih struktura koje su potrebne za ustroj iskustva u VR-u (Vince, 2004). VR se definira kao „uporaba trodimenzionalnog računalno-generiranog okruženja koje se zove 'virtualno okruženje', u kojemu se može kretati i po mogućnosti interaktivno djelovati te tako posljedično ostvariti simu-

1. INTRODUCTION

The paper focuses on investigating whether or not a combination of virtual reality (VR) and reality could give tourism greater sustainability, whilst exploring how likely it is that the tourist experience might increasingly become such a combination in order to more appropriately satisfy the demands of sustainability. More specifically, the study explores the effects of VR on the consumers before they even begin planning their vacation, through identification of the main affective and cognitive responses as important mediators in predicting important attachments, decision-making processes and travel intentions.

The aforementioned focal points are explored through literature review encompassing important constructs: VR, consumer behavior and sustainability in tourism. Due to the existence of knowledge gaps pertaining to these concepts, it is of the utmost importance to conduct such a review, and the systematic mapping process of this study reveals such gaps and fills them in though specifications of links between the concepts. The paper is structured in the following way: the insight into the theoretical background stating what is known and what is not known in the area of exploration is provided; objectives and research questions are defined; research design and search strategy are elaborated; results and discussions are presented; and lastly conclusion, limitations and future research suggestions are given.

2. THEORETICAL BACKGROUND

2.1. Tourism destination marketing based on technology: virtual reality potential

There are evident discrepancies in the attempts to define VR, because of the variance when labelling the different structures necessary for the constitution of an experience in VR (Vince, 2004). VR can be defined

laciju korisnikovih osjetila u realnom vremenu" (Gutierrez *et al*., 2008).

Iskustvo VR-a pruža psihološku prisutnost i fizičko uranjanje (Gutierrez *et al*., 2008). U tom slučaju, „uranjanje" znači mjeru u kojoj korisnikova izolacija od stvarnog svijeta i tako u „potpuno uronjenom sustavu" korisnik je apsolutno obuzet „virtualnim okruženjem" te nema nikakvu interakciju sa stvarnim svijetom dok nasuprot tomu, kako u „polu-uronjenom" tako i u „ne-uronjenom sustavu", korisnik uspijeva zadržati izvjesnu interakciju sa stvarnim svijetom. Razina uranjanja u sustav virtualne stvarnosti (VR) jest čimbenik koji ima sposobnost utjecanja na korisnikov osjećaj prisutnosti (Banos *et al*., 2004). Također, Slika 1 prikazuje VR kao sustav koji ima tri osnovna obilježja: interakciju, imaginaciju i uranjanje kao potpuni odraz tehnologije.
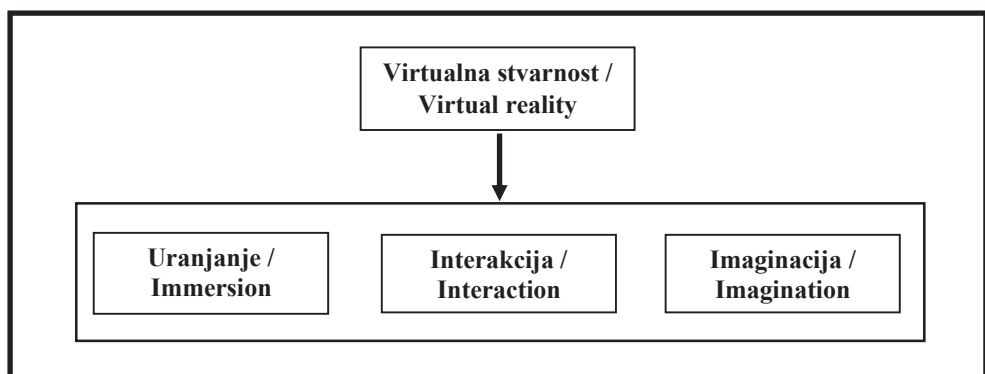
Potencijal VR-a u području turizma bitan je alat i za pružatelje usluga i za korisnike. Iz perspektive korisnika može biti instrument doživljavanja novih uzbudljivih stvari, a pružatelju usluga može ponuditi marketinške mogućnosti. S nastavkom razvoja ovih tehnologija potencijalno korisne mogućnosti u turizmu rast će eksponencijalno. Bez obzira na smjer kojim ovi napori i razvoj krenu, njihove neposredne primjene u turizmu su već sada moguće. Osobine tehnologije VR-a

as "the use of a three-dimensional computer-generated environment called a 'virtual environment', that can be navigated through and possibly interacted with, subsequently generating a real-time simulation of user's senses" (Gutierrez *et al*., 2008).

The VR experience provides psychological presence and physical immersion (Gutierrez *et al*., 2008). In this case, 'immersion' signifies the extent of the user's isolation from the real world, and thus in a 'completely immersive system' the user is absolutely contained by the virtual environment (VE) and does not have any interaction with the real world, whilst on the other hand, in a 'semi-immersive' or 'non-immersive system' the user manages to retain some interaction with the real world. The level of immersion in a VR system is a factor that possesses the ability to influence the user's feelings of presence (Banos *et al*., 2004). Similarly, Figure 1 shows that VR as a system has three basic features: interaction, imagination and immersion in order to fully reflect the technology.

The VR potential in the field of tourism is an essential tool for both the provider and the user. It can possibly be an instrument for experiencing new exciting things from a user's perspective and offer marketing opportunities

Slika 1: Obilježja virtualne stvarnosti /
Figure 1: Characteristics of virtual reality

Izvor: prilagođeno prema Guttentag, 2010 / Source: Adapted from Guttentag, 2010

koncentriraju se na prikladnu prostornu vizualizaciju okoliša (Vince, 2004).

Već je prepoznato da VR može "potencijalno pomoći kao osnovni alat u formuliranju turističke politike i u procesu planiranja" (Cheong, 1995). Vjeruje se da VR omogućuje stvaranje realističnih i pokretljivih virtualnih okruženja koja su lako dostupna za analizu planova razvoja turizma s ciljem razmatranja mogućih smjerova. Štoviše, time se omogućava promatranje okoliša iz bezbroj perspektiva kao alternative za primarnu ptičju perspektivu koja vodi brzoj vizualizaciji potencijalnih promjena kojima se potom može pristupiti (Sussmann i Vanhegan, 2000). Slika destinacije može utjecati na izbor destinacije na svim etapama putovanja, a one uključuju vrijeme prije putovanja, zadovoljstvo u destinaciji u stvarnom vremenu u kojem se osobno iskustvo vrednuje prema očekivanjima, i konačno, opetovano ponavljanje slike nakon putovanja (Litvin, Goldsmith i Pan, 2008). Stoga su marketinški stručnjaci u turizmu prisiljeni stalno biti u tijeku i tražiti nove i usavršene načine promocije i usmjeravanja pozitivnog imidža destinacije, poglavito uporabom koncepata koji prvenstveno potiču stavove i utječu na namjere kupovine (Spears i Singh, 2004).

Elementi vizualnih predodžbi već su dugo vremena prisutni u marketingu i promociji turizma (Aziz i Zainol, 2011). Budući da je to jedno od najpoznatijih obilježja turizma kao uslužne aktivnosti, njegove materijalne osobine prisiljavaju marketinške stručnjake na neprestano razvijanje oblika vizualnih predodžbi kako bi obnavljali destinacije i promovirali pozitivnu sliku destinacije (Lee *et al.*, 2017). Naglašen osjetilni i emotivni doživljaj putem VR-a, koji je moguć na platformama s naprednim oblicima vizualnih predodžbi, predstavlja koristan alat za marketinške stručnjake koji im dozvoljava uspostavljanje komunikacije iskustava i emocija te time neumitno utječe na potrošače i turiste.

Mnogi marketinški stručnjaci i promotori u turizmu već su prilagodili mnoge oblike tehnologije VR-a u nastojanju da putnicima

from the provider's viewpoint. As these technologies continue to advance, the opportunities to prove themselves as beneficial in the tourism sector will grow exponentially. Regardless of the direction which these advancements and developments take, their immediate applications within the tourism industry are already possible. The attributes of the VR technology concentrate on a suitable spatial environment visualization (Vince, 2004).

It has already been recognized that VR can "potentially aid as a vital tool in the tourism policy formulation and in planning process" (Cheong, 1995). It is believed that VR enables the creation of realistic and navigable virtual environments readily available for tourism planners' analysis in their consideration of possible developments. In addition, it makes it possible to observe the environment from an infinite number of perspectives as an alternative to the primary bird's-eye view, leading to a rapid visualization of potential changes that can be subsequently accessed (Sussmann and Vanhegan, 2000). An image of a destination is able to affect a visitors' destination choice in all stages of travel, including the time before travelling, and the real-time satisfaction in a destination during which personal experience is being assessed against expectations, and ultimately to perpetuate the images after the trip (Litvin, Goldsmith and Pan, 2008). Therefore, marketers in the travel industry are forced to constantly stay up to date and look for new and improved ways of promoting and targeting a positive destination image, mainly through the use of concepts that primarily provoke attitudes and influence purchase intentions (Spears and Singh, 2004).

The visual imagery elements have long been present in the tourism sector within its marketing and promotions (Aziz and Zainol, 2011). Since it is one of the best-known characteristics of tourism as a service, its intangible properties are forcing marketers to continually develop forms of visual imagery in order to reproduce destinations and promote

daju pretpregled doživljaja atrakcija i lokacija, uključujući hotele, brodove za krstarenje i sličnih turističkih iskustava (Samuely, 2016). Virtualne informacije posredovane na web stranicama pozitivno utječu na virutalnu konativnu sliku koja proizlazi iz potencijalne namjere kupnje (Hyun i O'Keefe, 2012). Inherentna važnost VR-a nalazi se u njezinoj sposobnosti „isporučivanja doživljaja potrošaču", a takav virtualni doživljaj može povećati želju potrošača za posjetu lokaciji (Cheong, 1995). Potencijal VR-a u turističkom marketingu vrlo je razvidan u njezinom kapacitetu ponude ekstenzivne senzorne informacije na moguće i buduće turiste. Zbog činjenice da su turistički proizvodi tzv. roba na povjerenje koje potrošači ne mogu testirati unaprijed i moraju odlučiti o kupnji samo na temelju dostupnih informacija, takve su tehnologije posebno korisne u turizmu (Liu, 2005). Ove posebne koristi (Buhalis i Law, 2008) su idealno sredstvo za pružanje velikog broja podataka i opisnih informacija o destinaciji potencijalnim turistima. Najnovija generacija uređaja za VR uključuje snažne alate za destinacijski marketing. Očekuje se da će ti visoko napredni uređaji utjecati na turistička iskustva na revolucionaran način (Tussyadiah, 2016), a to obuhvaća i fazu prije posjeta u kojoj se u svijest turista može utisnuti zanimanje, poznavanje i iščekivanje (Jung *et al*., 2017).

Iako se tehnologija VR-a stalno razvija, mali je broj istraživanja na teme posebnih čimbenika koji potrošače navode da požele posjetiti destinacije koje su im prezentirane u VR-u. Taj nedostatak u literaturi pokrilo je nekoliko studija koje su razvile teoretski okvir koji se sastoji od autentičnog iskustva, afektivnih i kognitivnih odgovora, privrženosti i namjera posjete u turizmu VR-a koristeći teoriju modela S-O-R (nadalje SOR) (Kim, Lee i Jung, 2018). Glavni pravac istraživanja odnosi se na uspješnu primjenu percepcija iskustvenog marketinga u kontekstu turizma (Ritchie, Tung i Ritchie, 2011) i destinacijskog marketinga (Ye i Tussyadiah, 2011).

a positive destination image (Lee *et al*., 2017). The emphasized sensory and emotional experience through VR is enabled for platforms with advanced forms of visual imagery, and thus it represents a useful tool for marketers, which allows them to establish a communication of experiences and emotions, and inevitably influence consumers and travelers.

Many marketing managers and promoters in the tourism sector have already adapted many forms of the VR technology in an attempt to deliver travelers a preview experience of attractions and sites, including hotels, cruise ships and similar travel experiences (Samuely, 2016). Web-mediated virtual information positively influences the virtual conative image, resulting in a potential purchase intention (Hyun and O'Keefe, 2012). The underlying importance of VR lies in its ability to "deliver the experience to the customer" and such virtual experience can potentially increase the customer's desire to actually visit a location (Cheong, 1995). The potential of VR in the tourism marketing is clearly seen in its capacity to offer extensive sensory information to potential and prospective tourists. Due to the fact that tourism products are 'confidence goods' which consumers cannot test in advance and must decide on purchase based simply on the available information, such technologies are especially useful in the tourism industry (Liu, 2005). These particular benefits (Buhalis and Law, 2008) are an ideal instrument for the provision of rich data and descriptive information on a destination to potential tourists. The newest generation of VR devices includes powerful tools for the destination marketing efforts. It is expected that these highly advanced devices will have an impact of revolutionary nature on tourism experiences (Tussyadiah, 2016), including the pre-visit stage, where interest, awareness and anticipation can be imprinted in the tourist's mind (Jung *et al*., 2017).

Although VR is an evolving technology, little research has been done on the specific

Uporaba turizma VR-a omogućava spektar mogućnosti putovanja na razna mjesta putem aplikacija i uređaja VR-a (Stanley, 2017). Novija istraživanja o informacijskoj tehnologiji u turizmu pokazala su da je korištenje iskustvenih konstrukata vrlo vrijedno u procesu razumijevanja upotrebe i utjecaja tih tehnologija (Chung, Han i Joun, 2015) i, točnije, virtualnih tehnologija (Jung *et al*., 2017). Prvenstveno su naglasila potencijale emocionalnih i imaginativnih odgovora na virtualna iskustva u turističkom marketingu. VR ima značajan potencijal kao promotivno sredstvo u poticanju stvarnih turističkih posjeta (Tussyadiah, Wang i Jia, 2016). Ona naročito oduševljava u turizmu jer predstavlja kanal neizmjernih mogućnosti za komuniciranje nematerijalnih turističkih iskustava širim auditorijima. Turizam se u procesu promocije već dugo vremena oslanja na vizualne predodžbe za komuniciranje i utjecaj na potrošače. Unatoč opreznom usvajanju VR-a, on se očito počinje širiti s povećanim brojem poslovnih subjekata koji uklapaju elemente u svoje marketinške prakse. K tomu, neke su studije o VR-u promatrale ponašanje potrošača i uživanje u sadržaju VR-a (Guttentag, 2010). Uz činjenicu da je tehnologija VR-a vrlo učinkovito uspijevala pokazati svoju stabilnost i izglede kao koristan marketinški instrument, više je teorijskih studija na temu potrošačkog ponašanja VR-a potrebno kako bi se odredilo koji su čimbenici ključni za poticanje turista na potencijalni posjet destinacijama koje su otkrili u VR-u.

factors that make consumers develop a desire to visit destinations presented by VR. In an attempt to address such a gap in literature, several studies developed a theoretical framework comprising the authentic experience, affective and cognitive responses, attachment, and visit intention with the VR tourism using a stimulus-organism-response (hereinafter SOR) theory (Kim, Lee and Jung, 2018). A key stream of research has successfully managed to apply experiential marketing perceptions in the context of tourism (Ritchie, Tung and Ritchie, 2011) and destination marketing (Ye and Tussyadiah, 2011).

The use of VR tourism provides the spectrum of possibilities where people are able to travel anyplace by means of VR applications and VR devices (Stanley, 2017). Recent research on the information technology in the tourism industry itself found the use of experiential constructs very valuable in the process of understanding the use and impact of such technologies (Chung, Han and Joun, 2015) and, more specifically, of virtual technologies (Jung *et al*., 2017). Most importantly, it emphasized the potential of emotional and imaginative responses to virtual experiences in tourism marketing. VR has a considerable potential as a promotional tool to boost real life tourism visits (Tussyadiah, Wang and Jia, 2016). As such, VR is particularly fascinating for the tourism sector because it represents a channel of immense opportunities for the communication of intangible tourism experiences to the wider audience. The tourism industry has long been relying on the use of visual imagery in its promotion process in order to communicate and establish influence in the relationship with the consumers. In spite of the cautious adoption of VR, it is evidently beginning to flourish as an increasing number of companies incorporate its elements into their marketing practices. Moreover, some studies on the VR tourism observed consumer behavior, together with the VR content enjoyment and the choice of destination shown in VR (Guttentag, 2010). While it is a fact that

2.2. Održivi turizam i nesuglasice održivosti

„Održivi turizam" najčešće je korišten pojam u razvoju turizma i kao takav obuhvaća širok spektar okolišnih, ekonomskih i socio-kulturnih pitanja intra- i inter-generacijskog kapitala koji se često koriste u debatama o održivosti. Turizam po prirodi znači proces proizvodnje i potrošnje mnogih krhkih resursa uključujući i povijesne građevine, prirodna područja, okoliš i kulturu. U tom smislu, održivi razvoj njegova je žarišna točka (Cooper *et al*., 2008). Prema definiciji Svjetske turističke organizacije (UNWTO) održivi turizam je „turizam koji uzima u obzir sadašnje i buduće društvene, okolišne i ekonomske utjecaje, vodeći računa o potrebama posjetitelja, okoliša, sustava i lokalnih zajednica". Nadalje se tvrdi da je održivi turizam apsolutno bitan i da bi stoga trebao optimalno rabiti okolišne resurse održavanjem osnovnog ekološkog procesa i pomaganjem očuvanja prirodnog naslijeđa i bioraznolikosti. Socio-kulturna autentičnost lokalnih zajednica od najveće je važnosti za održivost, a treba se održavati očuvanjem njihovih naslijeđa, tradicija i kultura, kao i doprinosom razumijevanju među različitim kulturama. Ovime će se postići osiguranje dugoročnih socio-ekonomskih koristi.

Održivost, osobito ona koja se odnosi na razvoj turzima, često je bila subjektom mnogih rasprava u znanstvenoj literaturi koja je navodila turizam na pokušaj operacionalizcije koncepta u određenom vremenu. Stalna borba vidi se i u neprestanim raspravama o zaslugama načela održivosti u turizmu kao i o njegovom odnosu na razvoj turizma; neki dionici misle da se razvoj turizma ne bi trebao usporavati, dok drugi traže ravnotežu između ekološke odgovornosti i ekonomskih stvarnosti (Liu, 2005). Razvoj održivog turizma ostaje ozbiljan problem za neke koji su skloni tvrditi da nije postojao niti jedan stvarni pokušaj prave promjene sustava (Cottrell *et al*., 2004). Daljnja istraživanja otkrivaju kako će postojeća ubrza-

the VR technology has very effectively managed to demonstrate its ability and prospects as a useful marketing instrument, more theoretical studies on the VR consumer behavior are necessary to determine which factors are key in encouraging tourists to potentially visit destinations revealed in VR.

2.2. Sustainable tourism and sustainability conflicts

"Sustainable tourism" is the most frequently used concept in the tourism development and as such, it encompasses broad environmental, economic and socio-cultural issues, as well as ethics and platforms of intra- and inter-generational equity often used in the debates on sustainability. By its nature, tourism involves a process of production and consumption of many fragile resources including historical buildings, areas of nature, environment and culture. In this respect, sustainable development is a focal point in the industry such as tourism (Cooper *et al*., 2008). The United Nations World Tourism Organization (UNWTO) defines sustainable tourism as "tourism that takes into regard its current and future social, environmental and economic impacts, to take into account the needs of visitors, the environment, industry and host communities". It further claims that sustainable tourism is absolutely essential and that it should therefore make optimal use of environmental resources by maintaining essential ecological process and helping to conserve natural heritage and biodiversity. The socio-cultural authenticity of host communities is of utmost importance for sustainability, and it should be maintained by conserving their heritage, traditions and cultures, as well as by contributing to understanding between diverse cultures. This will result in ensuring the long-term socio-economic benefits.

Sustainability, particularly related to tourism development, has been largely debated in much of the academic literature, forcing the tourism sector to attempt to oper-

Prikaz 2: Odnos između održivog turizma i ostalih pojmova / Figure 2: The relationship between sustainable tourism and other terms

Izvor: prilagođeno iz Sustainable tourism management*, Swarbrooke (2010) / Source: adapted from "Sustainable tourism management" by Swarbrooke (2010)*

na proširenja turističkih mjesta i odredišta neminovno imati mnoge negativne učinke uključujući i mogućnost da nanesu štete zajednicama i prirodi te društvima i kulturama općenito (Budeanu, 2005). Međutim, od početka novog razvoja turizma, potrošači pokazuju značajne promjene u strukturama motivacije i putovanja te tako potiču nastanak novih vrsta usluga. Ovi čimbenici i brz razvoj informacijskih tehnologija stvorili su diferenciraniji i fleksibilniji model turizma. Nadalje, uz pokušaje izbjegavanja rasprave o implikacijama održivog turizma kao općeg pojma, ostaje tvrdnja da se održivi turizam ne može ostvariti ako se prakse masovnog turizma ne prilagode tako da se integrira održivost. Istraživanja navode da se utjecaj integracije održivosti u turizam može koristiti kao pokretač pozitivnih promjena u stavovima i praksama prema održivijem turizmu (Tussyadiah, 2016).

ationalize the concept during a certain time period. The constant struggle is seen in the continued debate on the merits of the concept of sustainability in tourism, as well as on its relation to the tourism development; some stakeholders believe that the tourism development should not be hindered while others ask for a balance between the ecological responsibility and economic realities (Liu, 2005). Sustainable tourism development remains a 'wicked problem' for some as they tend to argue that no real attempts towards a change have been made in the industry (Cottrell *et al*., 2004). Further insight in research reveals that these accelerating expansions of tourist sites and resorts are bound to have many negative impacts involving the potential to inflict damage on communities, nature, societies and cultures at large (Budeanu, 2005). However, since the beginning of the new tourism development, consumers have been showing substantial changes in their motivations and travel patterns, thus triggering the emergence of a new set of services. These factors and the quick development of information technologies have created a more differentiated and flexible tourist model. Furthermore, in an attempt to avoid the debate on the implications of sustainable tourism as an overall concept, the proposition stands that sustainable tourism cannot be achieved if mass tourism practices are not adjusted so as to integrate sustainability. Research suggests that the influence of the integration of sustainability into the tourism system can be used to trigger positive changes in attitudes and practices towards a more sustainable tourism (Tussyadiah, 2016).

3. CILJEVI STUDIJE I ISTRAŽIVAČKA PITANJA

Studija je usmjerena na razumijevanje i prikaz učinaka VR-a na turizam i njegovu sposobnost valjanijeg ispunjavanja zahtjeva održivosti turizma. Istraživački problem proizlazi iz potrebe za temeljitijim istraživanjem nedovoljno istraženog područja ponašanja potrošača VR-a, što je potrebno kako bi se odredili odlučujući čimbenici mogućih poticanja turista na posjet destinacijama koje su otkrili putem VR-a.

Glavni ciljevi istraživanja su kako slijedi:

- Ispitati može li kombinacija VR-a i stvarnosti osigurati veću održivost turizma.

- Istražiti kolika je vjerojatnost da turističko iskustvo postane mješavina stvarnosti i VR-a kako bi prikladnije ispunilo zahtjeve održivosti.

- Proučiti kako VR mijenja *igru putovanja* prije nego što potrošač i počne planirati svoje putovanje.

3. OBJECTIVES OF THE STUDY AND RESEARCH QUESTIONS

The research subject of the study is understanding and presenting the effects of VR on tourism and its ability to better satisfy the demands of tourism sustainability. The research problem arises from the need for a more thorough investigation of the so far rather scarce studies on the VR consumer behavior, which are necessary to determine factors that are crucial in potentially encouraging tourists to visit destinations revealed in VR.

The principal objectives of this study are as follows:

- To investigate whether a combination of VR and reality could give tourism greater sustainability.

- To explore how likely it is that the tourist experience will increasingly become a mixture of reality and VR to satisfy the demands of sustainability more appropriately.

Tablica 1: Istraživačka pitanja i motivacije

Br.	Pitanje	Motivacija
IP1	Kako trodimenzionalna vizualizacija može omogućiti razvoj održivog turizma i paniranje održivog turizma?	Razumijeti različite aspekte općenito područja AR-a, VR-a i ICT-a i potencijalno ih povezati s održivošću i perspektivama masovnog turizma.
IP2	Kako VR kao obećavajući trend u turizmu i ugostiteljstvu može zadovoljiti potrebe turista?	Pronaći potencijalne buduće pomake industriji ICT-a i turizmu kako bi se bolje zadovoljile potrebe turista.

Table 1: Research questions and motivations

No.	Question	Motivation
RQ1	How can three-dimensional visualization facilitate sustainable tourism development and sustainable tourism planning?	Understand the different aspects of AR, VR and ICTs overall areas and potentially link those terms to sustainability and perspectives on mass tourism.
RQ2	How can VR as a promising trend in tourism and hospitality meet future needs of tourists?	Find out potential future developments related to the ICTs industry and tourism in better meeting tourists' needs in the future.

- Identificirati afektivne i kognitivne odgovore kao relevantne posrednike u predviđanju privrženosti, procesa odlučivanja i namjere putovanja

Tablica 1 predstavlja istraživačka pitanja čiji je cilj pružiti saznanja o nekoliko pojmova istraživanja u odnosu na VR i utjecaj ICT-a na turizam u smislu stvaranja i očuvanja veće održivosti i u skladu s literaturom.

4. DIZAJN ISTRAŽIVANJA

Metodologija korištena u istraživanju tehnika je sustavnog mapiranja koja je razvijena u društvenim znanostima kao odgovor na nedostatak empirijskih podataka u odgovaranju na pitanja koja koriste druge metode. To savršeno odgovara ovoj temi budući da ne postoji obilje prethodnih istraživanja te vrste i da, po svojoj prirodi, predložena tema ne zahtijeva napore kako bi se odgovorilo na određeno pitanje i/ili dokazala relevantna hipoteza. Doista, tehnika sustavnog mapiranja dozvoljava prikupljanje, opisivanje i popisivanje dostupnih izvora podataka koji mogu biti primarni ili sekundarni, teoretski ili ekonomski te koji se posljedično odnose na temu ili pitanje od interesa. Studije sustavnog mapiranja pogodne su za područje u kojem je izvedeno nekoliko pregleda literature na određenu temu i gdje je potrebno dati opći pregled područja od interesa (Kitchenham i Charters, 2007). Zato je odabran ovaj pristup za upravo ovu studiju i postupak koji je razvio Petersen (Petersen *et al*., 2008).

Faze postupka istraživanja koje su bile prilagođene studiji prikazane su grafički na slici 3.

- To investigate how VR is changing the travel game before a consumer even begins to plan their vacation.
- To identify affective and cognitive responses as important mediators in predicting attachment, decision-making process and travel intention
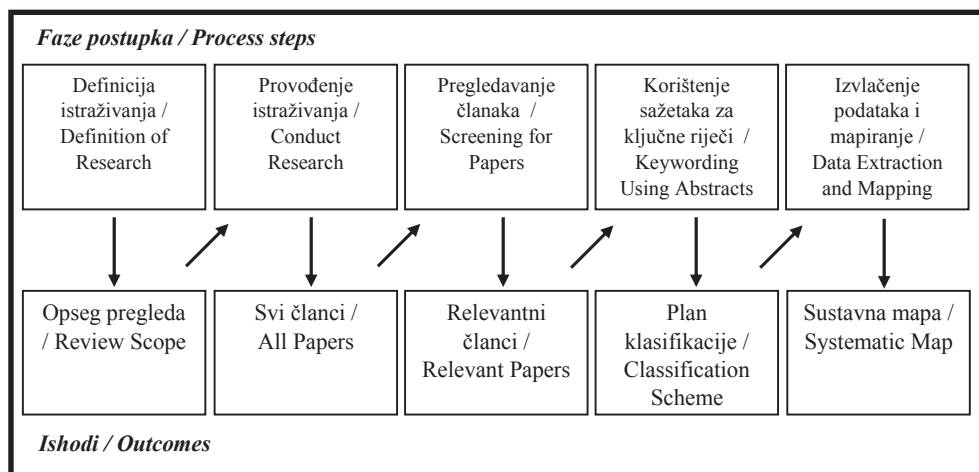
Table 1 presents research questions intended to provide insights into several concepts of investigation, in reference to the VR and ICTs influence on the tourism industry in terms of creating and maintaining greater sustainability, based on the literature.

4. RESEARCH DESIGN

The methodology used in the study is the systematic mapping technique. It was developed in social sciences in response to a lack of empirical data when answering questions using other methods, which makes it a perfect match for this topic, given that not a lot of research of this kind has been previously conducted and that, by its nature, the proposed topic does not require an attempt to answer a specific question and/or prove a relevant hypothesis. Indeed, the systematic mapping technique allows collating, describing and cataloguing all the available evidence, which can be primary or secondary, theoretical or economic in nature, and which consequently relates to the topic or question of interest. Systematic mapping studies are suitable for a field where several literature reviews have been completed on the topic and where a general overview of the field of interest needs to be given (Kitchenham and Charters, 2007). Therefore, this approach was selected for this particular study, and a process developed by Petersen was followed (Petersen *et al*., 2008).

The research process steps, adapted for the study, are shown graphically in Figure 3.

Slika 3: Faze postupka i ishodišta tehnike sustavnog mapiranja /
Figure 3: Process steps and outcomes of systematic mapping technique

Faze postupka / Process steps				
Definicija istraživanja / Definition of Research	Provođenje istraživanja / Conduct Research	Pregledavanje članka / Screening for Papers	Korištenje sažetaka za ključne riječi / Keywording Using Abstracts	Izvlačenje podataka i mapiranje / Data Extraction and Mapping
Opseg pregleda / Review Scope	Svi članci / All Papers	Relevantni članci / Relevant Papers	Plan klasifikacije / Classification Scheme	Sustavna mapa / Systematic Map
Ishodi / Outcomes				

Izvor: prilagođeno prema "Systematic Mapping Studies in Software Engineering" autora Petersen et al. (2008) / Source: adapted from "Systematic Mapping Studies in Software Engineering" by Petersen et al. (2008)

4.1. Strategija pretraživanja

Kao što je prikazano u Tablici 2, niz pretraživanja bio je širok zbog cilja koji je obuhvaćao široku perspektivu pojmova kojima se bavila studija. Prepozato je nekoliko ključnih riječi za niz pretraživanja, a korišteni su i relavantni sinonimi za izvorne ključne riječi. Elementi u nizu pretraživanja povezani su s logičkim operatorima kako bi se osiguralo generiranje svih relevantnih članaka.

U postupku izbora i pretraživanja korištene su sljedeće baze podataka, budući da su identificirane kao relevantne i za turizam i za područje IT-a: EMERALD; IOPscience; SCOPUS; Google Scholar; EBSCO; ABI/INFORM Complete – ProQuest.

Cilj postupka izbora članaka u ovom istraživanju bio je izlučiti publikacije koje su relevantne za ciljeve studije sistematičkog mapiranja (SMS) na temelju nekoliko kriterija uključivanja ili isključivanja (Khakurel, Melkas i Porras, 2017). Stoga je korišten sljedeći set kriterija uključivanja i isključivanja.

4.1. Search strategy

As depicted in Table 2, the search string was broad due to the aim for a comprehensive perspective on concepts covered in the study. Several keywords for the search string were identified. The relevant synonyms for the initial keywords were used as well. The items in the search string were linked with OR operators, to ensure that all relevant papers would be generated.

The following digital databases were used in the process of selection and research, because they were identified as relevant to both the tourism and IT fields: EMERALD; IOPscience; SCOPUS; Google Scholar; EBSCO; ABI/INFORM Complete – ProQuest.

The aim of the process of article selection in this paper was the extraction of publications relevant to the objective of the systematic mapping study (SMS) based on several inclusion and exclusion criteria (Khakurel, Melkas and Porras, 2017). Therefore, the fol-

Tablica 2: Niz pretraživanja

Table 2: Search string

Elementi znakovnog niza za pretragu
'VR' ili 'marketing VR-a'
Ili 'iskustvo VR-a' ili 'iskustvo uvećane stvarnosti'
Ili 'ICT' ili 'ICT u turizmu'
Ili 'masovni turizam' ili 'održivi turizam'
Ili 'održivost masovnog turizma' ili 'održivost putovanja'
Ili 'ponašanje potrošača u turizmu' ili 'probaj-prije-nego-kupiš'
Ili 'SOR' ili 'modeli ponašanja potrošača'

Search string items
'VR' or 'VR marketing'
Or 'VR experience' or 'augmented reality experience'
Or 'ICTs' or 'ICTs in tourism'
Or 'mass tourism' or 'sustainable tourism'
Or 'mass tourism sustainability' or 'travelling sustainability'
Or 'consumer behavior in tourism' or 'try-before-you-buy'
Or 'stimulus-organism-response' or 'consumer behavior models'

Kriteriji uključivanja bili su: studije objavljene u novinama, časopisima, ili obrazovnim konferencijama elektroničkih digitalnih biblioteka; članci na engleskome jeziku; objavljeno između 2010. i 2019. godine; releventnost istraživačkog pitanja; znanstveni i recenzirani članci; studija se odnosi na ICT, AR, VR i ponašanja kod kupovine putovanja; članak se usmjerava na temu koncepata masovnog turizma i održivosti.

S obzirom na činjenicu da je polje istraživanja područje u kojem je proveden velik broj ispitivanja, primijenjeni su kriteriji isključivanja kako bi se zadržao razuman broj članaka: udvostručeni članci i studije dobivene iz različitih tražilica; članci i radovi koji se fokusiraju na usporedbe niže razine; uvodnici i nerecenzirani članci; članci koji nisu potpuno dostupni.

Postupak pretraživanja prikazan je na Slici 4. Korišten je niz pretraživanja na svakoj od sedam referentnih baza podataka i dobiven je veliki broj članaka na svakom mjestu. Budući da je definiran širok raspon istraživanja, nizovi pretraživanja koji su se sastojali od općih pojmova dali su iznenađujuće velik broj referenci. Za upravljanje referencama i uklanjanje nekih duplikata iz

lowing set of inclusion and exclusion criteria was used.

Inclusion criteria were as follows: studies published in electronic digital libraries from newspapers or journals, educational conferences; articles written in English; published between 2010 and 2019; relevant to the research question; scientific and peer-reviewed articles; the study refers to the ICTs, AR, VR and travel purchase behaviors; the paper focuses on the topic of the mass tourism and sustainability concepts.

Considering the fact that the field investigated in this study is an area where abundant research has been carried out, exclusion criteria were applied to keep the number of articles reasonable. Exclusion criteria were as follows: duplicated papers and studies returned by different search engines; papers and works that focus on low-level comparison; editorials and non-peer reviewed articles; articles that are not fully accessible.
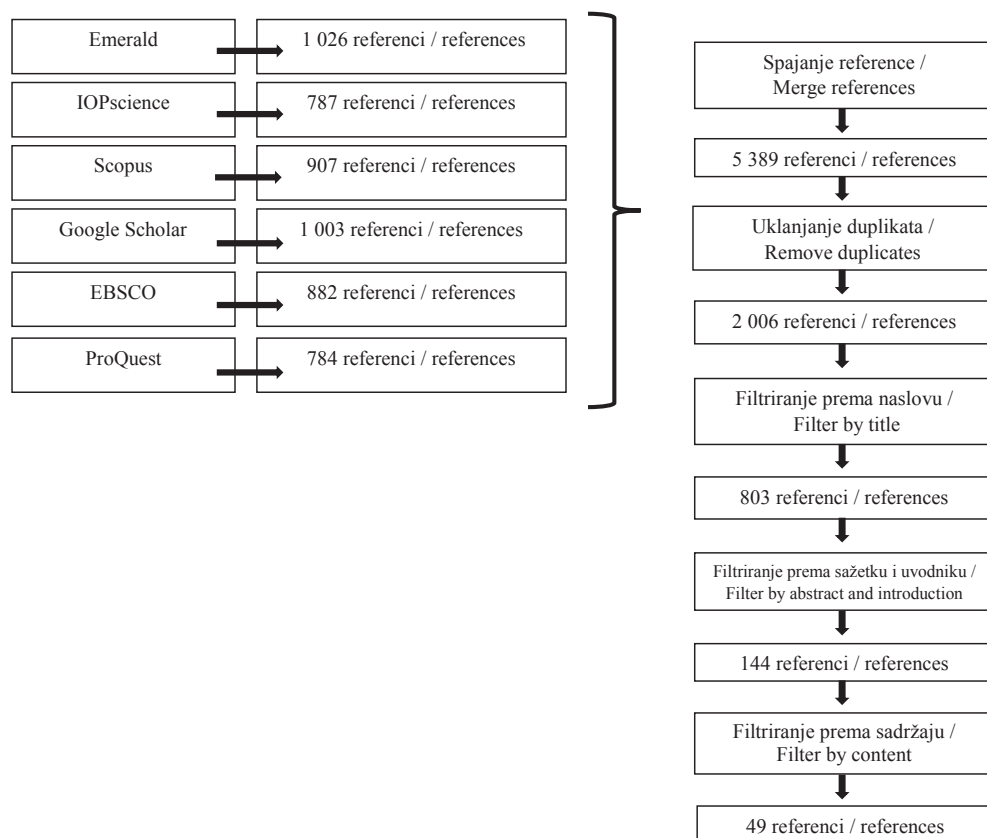
The search process depicted in Figure 4 was used. The search string on each of the seven reference databases was used and a large number of papers was obtained for each venue. Since the scope of research has been defined as broad, with search strings con-

početnog skupa korišten je alat HAMMER (nails project, 2019). Zatim su članci filtrirani prema naslovu kako bi se lakše uklonili članci koji su očito bili izvan okvira istraživanja. U nejasnim slučajevima članak smo ostavili i koristili kako bi se izbjegao rizik izbacivanja relevantnih članaka. K tomu, u konačnom skupu odabranih članaka sažetak i uvod analizirani su kako bi se utvrdilo da su odgovarajuća podudaranja. Konačno se zadnja skupina članaka čitala, analizirala i odabrala prikladnom za analizu.

Prilog 1 sumira 49 objavljenih referenci istraživanja relevantnih pojmova u korištenom nizu pretraživanja.

taining general terms, the results obtained were surprisingly large numbers of references found. The HAMMER (nails project, 2019) tool was used to manage the references and to allow the removal of some duplicates from the initial set. The articles were then filtered by title, for the easier removal of papers that were clearly out of scope. When it was not clear whether a paper should be used, it was kept, in order to avoid the risk of filtering out any relevant papers. Additionally, in the final batch of chosen papers the abstract and introduction sections of papers were read to make sure they were the appropriate matches. Lastly, the final batch of papers comprised those

Slika 4: Postupak pretraživanja /
Figure 4: Search process

Emerald	1 026 referenci / references
IOPscience	787 referenci / references
Scopus	907 referenci / references
Google Scholar	1 003 referenci / references
EBSCO	882 referenci / references
ProQuest	784 referenci / references

Spajanje reference / Merge references
↓
5 389 referenci / references
↓
Uklanjanje duplikata / Remove duplicates
↓
2 006 referenci / references
↓
Filtriranje prema naslovu / Filter by title
↓
803 referenci / references
↓
Filtriranje prema sažetku i uvodniku / Filter by abstract and introduction
↓
144 referenci / references
↓
Filtriranje prema sadržaju / Filter by content
↓
49 referenci / references

Tablica 3: Distribucija časopisa u kojima je objavljeno 49 članka /
Table 3: Journal distribution of the 49 articles

Časopisi / Journals	Br. Studija / No. of studies	%
Journal of Ecotourism	1	2.04
Conservation Ecology	1	2.04
Annals of Tourism Research	1	2.04
Journal of Business Research	1	2.04
Journal of Sustainable Tourism	1	2.04
The International Journal of Networked Business	1	2.04
Journal of Hospitality and Tourism Technology	1	2.04
International Journal of History	1	2.04
Information and Management	2	4.08
International Journal of Culture, Tourism and Hospitality Research	2	4.08
International Journal of Technology Management	2	4.08
Tourism and Hospitality Research	2	4.08
Journal of Travel & Tourism Marketing	2	4.08
Journal of Tourism and Hospitality Management	3	6.12
Information Technology Journal	3	6.12
Journal of Travel Research	3	6.12
Journal of Destination Marketing & Management	3	6.12
Journal of Hospitality & Tourism Research	4	8.16
Current Issues in Tourism	4	8.16
International Journal of Contemporary Hospitality Management	5	10.20
Tourism Management	6	12.24
Ukupno	49	100.00

Kao što je prikazano u Tablici 3, 49 članaka objavljeno je u 21 releventnom časopisu posvećenom turizmu, marketingu i ITC-u. Najznačajniji broj članaka objavljen je u časopisima: *Tourism Management, Journal of Hospitality & Tourism Research, International Journal of Contemporary Hospitality Management* te *Information Technology Journal, Journal of Destination Marketing & Management* i *Current Issues in Tourism.*

that were fully read, understood and selected as appropriate for the analysis.

Appendix 1 summarizes the 49 published research references on relevant terms in the search string used.

As shown in Table 3, there are 49 articles published in 21 relevant tourism, marketing and technology journals. The most significant number of articles was published in *Tourism Management, Journal of Hospitality & Tourism Research, International Journal of Contemporary Hospitality Management*, followed by *Information Technology Journal, Journal of Destination Marketing & Management* and *Current Issues in Tourism.*

5. REZULTATI I RASPRAVA

U ovom dijelu analiziraju se rezultati 49 članaka u razdoblju od 2010. do 2019. godine.

Analiza predočena na Slici 5 prikazuje izabranu skupinu članaka koji su objavljivani godišnje. Kao što je ranije navedeno, pretraživanje je ograničeno na razdoblje između 2010. i 2019. godine i otkrilo je linearni rast pojave članaka 2015. godine, osim u 2010. godini kada je također zabilježen veći broj objava. Od 2015. godine zabilježen je trajan rast broja članaka o ciljanim temama, uz iznimku 2019. godine. Međutim, tekuća godina je mogući razlog zašto još nije uključeno više članaka u baze podataka.

U skupini odabranih članaka, većina je izrađena 2016. i 2017. godine, a to je upravo vrijeme kada je fenomen postao sve popularniji. Zanimanje za tu temu očito raste, iako se naglasak mijenja između nekoliko koncepata. Odabrani članci otkrivaju posebne konferencije na temu turizma i VR-a,
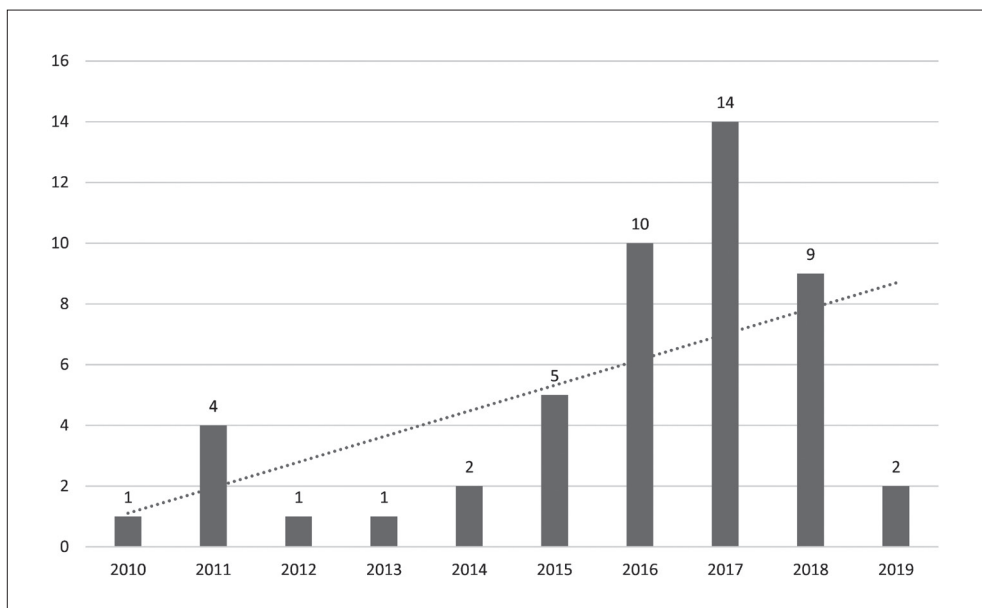
5. RESULTS AND DISCUSSION

In this section, the analyzed results from 49 articles dating from 2010 to 2019 are presented.

The analysis presented in Figure 5 displays the number of articles published per year from the selected set of articles. As previously stated, the search was restricted to 2010-2019, and it revealed a linear growth of articles' appearance starting in 2015, except in 2010, when a larger number of published articles was registered. Since 2015, a solid growth in the number of articles on the targeted topics has been recorded, except in 2019. However, it is the current year, which may be the reason why not many articles have been included in the databases yet.

Within the set of selected articles, most were produced in 2016 and 2017, which is exactly when the phenomenon regarding the topic became increasingly popular. The interest in the topic has evidently been growing,

Slika 5: Broj odabranih članaka po godinama /
Figure 5: Number of selected articles per year

ali je njihov broj prilično zanemariv. Ipak, veća skupina podataka otkriva da su općenito neki od najprikladnijih časopisa: *Tourism Management, Journal of Hospitality & Tourism Research, International Journal of Contemporary Hospitality Management* i *Current Issues in Tourism.*

Štoviše, odabrani su članci analizirani u odnosu na područje primjene ciljanih rješenja koja su po svojoj prirodi raznolika. Slika 6 prikazuje broj odabranih članaka prema domeni primjene.
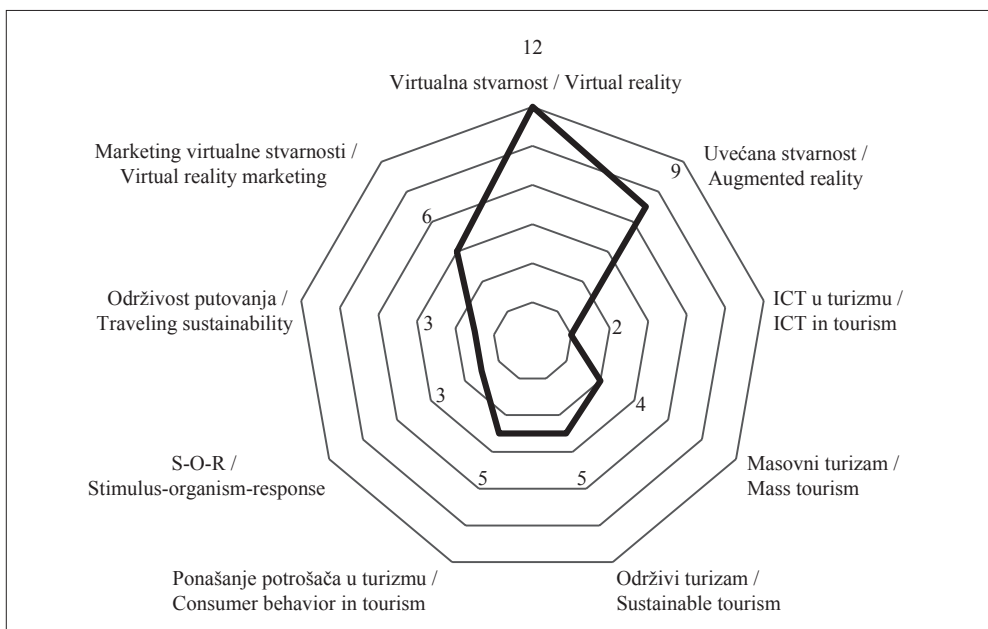
Većina članaka bavila se VR-om, koji je i žarišna točka većine istraživačkih pitanja, a slijedila je uvećana stvarnost. Samo je mali dio članaka nudio relativno opću percepciju ICT-a u turizmu. Prilično velik dio članaka usredotočio se posebno na ponašanje potrošača u turizmu za razliku od održivosti i masovnog turizma, a slijedili su ponašanje potrošača u turizmu, marketing virtualne stvarnosti i model S-O-R kao dio koncepta VR-a.

though the emphasis has been changing between several concepts. The selected articles reveal special conferences on the topic of tourism and VR, but their number is rather negligible. However, the larger dataset reveals that, in general, *Tourism Management, Journal of Hospitality & Tourism Research, International Journal of Contemporary Hospitality Management* and *Current Issues in Tourism* are some of the most appropriate journals.

Furthermore, the selected 49 articles were analyzed in reference to the application area of the targeted solutions, which are versatile in nature. Figure 6 shows the number of selected articles per application domain.

Most articles discussed VR, which is the focal point of most of the research questions in the thesis, followed by augmented reality. Only a small fraction of the articles had a rather general perception of ICTs in tourism. A rather large fraction focused specifically on consumer behavior in tourism as related

Slika 6: Broj odabranih članaka objavljenih prema području primjene /
Figure 6: Number of selected articles published by application area

Tablica 4: Identificirane teme podataka

Tema 1 *Masovni turizam*	Tema 2 *Razvoj održivosti turizma*	Tema 3 *Virtualna i uvećana stvarnost*	Tema 4 *Marketing virtualne stvarnosti*	Tema 5 *Ponašanje potrošača u turizmu*
ubrzani razvoj	odgovornost	tržišni podaci	vrtualni svijet	privrženost
gentrifikacija	bilanca	mjesto	tržišne marke	stimulacija
kratkoročan	socio-kulturne	poboljšanje	Google	evaluacija
okoliš	planirane	iskustvo	nosivi uređaj	traženje informacija
hedonizam	lokalne	uranjanje	užitak	S-O-R
negativni utjecaji	economske	interaktivnost	učinak	odlučivanje
vreva	etičke	imaginacija	potrošači	autentičnost

Table 4: Identified data topics

Topic 1 *Mass tourism*	Topic 2 *Tourism sustainability development*	Topic 3 *Virtual and augmented reality*	Topic 4 *Virtual reality marketing*	Topic 5 *Consumer behavior in tourism*
rapid development	responsible	market data	virtual world	Attachment
gentrification	balance	scene	brands	Stimulation
short-term	socio-cultural	enhancement	Google	Evaluation
environment	planned	experience	wearable device	information search
hedonistic	local	immersion	enjoyment	stimulus-organism-response
negative impacts	economic	interactive	effect	decision-making
crowd	ethics	imagination	consumers	Authenticity

Analizom veće skupine podataka dobiva se usporedba iz druge perspektive na temu rada istraživanja. Algoritmom se dobiva kategorizacija članaka u skupine tako da se dokumenti dodjeljuju temama te otkrivaju povezivanja i rasprostranjenost riječi u tekstu. Tablica 5 prikazuje prepoznate teme u odnosu na naslov rada i cjelokupno pretraživanje.
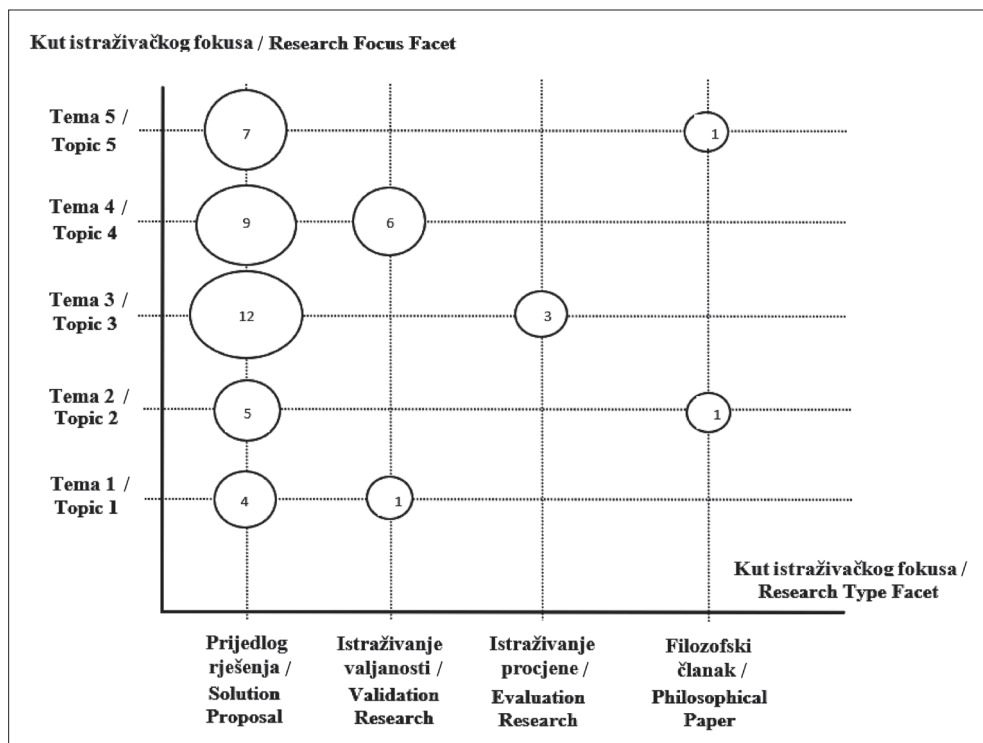
U daljnjoj analizi skupine odabranih članaka bile su kategorizirane prema vrstama korištenih istraživanja. Slika predstavlja mjehurasti dijagram tipova istraživanja koji su se koristili u člancima ovisno o posebnim temama (tema 1, 2, 3, 4 ili 5). Veličina mjehura odražava broj članaka koji se bave

to sustainability and mass tourism, followed by consumer behavior in tourism, VR marketing and the stimulus-organism-response model pertaining to VR concepts.

The analysis of the larger dataset is provided that is related to another perspective on the thesis topic and research. The algorithm is yielded for the categorization of articles into groups, assigning documents to topics, and it detected the word associations and distributions throughout the text. Table 5 represents the identified topics in reference to the title of the thesis and entire research.

In further analysis, sets of chosen articles were categorized by the research types used.

Slika 7: Vrste istraživanja prema distribuciji tema istraživanja /
Figure 7: Research type by research topic distribution

specifičnim tipom istraživanja. Čini se da je rješenje u najčešće korištenim tipovima članaka, a slijede validacijsko, evaluacijsko i filozofsko istraživanje.

Figure 7 represents a bubble chart of the research types used in the articles depending on the specific topics (Topic 1, 2, 3, 4 or 5). The size of the bubble signifies the number of articles that deal with a specific type of research. It appears that the most used research type in articles is the solution proposal, followed by the validation research, evaluation research and lastly the philosophical research.

IP 1: Kako trodimenzionalna vizualizacija može omogućiti održivi razvoj i održivo planiranje turizma?

Treba reći da VR može „potencijalno pomoći kao bitan alat u formuliranju turističke politike i u procesu planiranja" (Cheong, 1995). Smatra se da VR omogućava stvaranje stvarnih i plovnih virtualnih okolina koje su dostupne za analizu planova razvoja turizma u promišljanju mogućih smjerova. Štoviše, posljednji radovi ukazuju da 3D modeliranje i simulacije temeljene na računalu mogu biti vrlo učinkovite u planiranju i upravljanju održivim turizmom, budući da se mogu, putem skupnih podataka o posjetiteljima, detaljno koristiti za procjenu prijetnji, prilika i područja daljnjeg razvoja u područjima održivog turizma (Lawson, 2006). Nadalje, 3D vizualizacije okoline dozvoljavaju razumijevanje obrazaca vremena, prostora i mjesta, što se opet učinkovito koristi za razvoj planova upravljanja s ciljem pomicanja težine s intenzivno korištenih porduča na ona s ograničenim korištenjem (Lew i McKrecher, 2005).

Početni rezultati istraživanja o održivom razvoju u Rusiji (Kask, 2018) utvrdili su opću odsutnost praksi održivog turizma među ruskim turističkim djelatnicima te su otkrili rad kompanija na razvoju mogućnosti za održivi turizam kao dio poslovne strategije. Nadalje, sudionici istraživanja su u pogledu uvođenja održivog turizma ponudili četiri pristupa:

- Osnaživanje i poboljšavanje nacionalnog zakonodavstva za održivi turizam;
- Zaštita prirode i razvoj politika održivosti s ciljem održavanja područja od turističkog interesa;
- Promocija obrazovanja o okolišu kako bi se povećao interes za održivi turizam;
- Virtualno putovanje kao održiva alternativa turizmu u prirodi na lokacijama gdje su fizički kapaciteti nosivosti dostignuti ili u ograničenim područjima zbog zaštite prirode.

RQ1: How can three-dimensional visualization facilitate the sustainable tourism development and the sustainable tourism planning?

It has been recognized that VR can "potentially aid as a vital tool in the tourism policy formulation and in planning process" (Cheong, 1995). It is believed that VR enables the creation of realistic and navigable virtual environments available for the tourism planners' analysis in their consideration of possible developments. Moreover, recent research efforts suggest that 3D modeling and computer-based simulation can be very effective in planning and managing sustainable tourism, since by means of collective data on visitors, they can be precisely used to estimate threats, opportunities and areas for further development in the sustainable tourism areas (Lawson, 2006). Furthermore, 3D visualizations of environment allow understanding the visitors' patterns of time, space and place, which is in turn effectively used for the development of management plans to move the weight from areas with heavy use to those with a limited use (Lew and McKrecher, 2005).

Initial results of a research on the sustainable development in Russia (Kask, 2018) established that there is a common absence of sustainable tourism practices among major Russian tourism operators, further revealing that companies are working on developing sustainable tourism options as part of their corporate strategies. Furthermore, in terms of sustainable tourism implementation four approaches were offered by participants in the research:

- Strengthening and better enforcement of national legislation on sustainable tourism;
- Nature protection and sustainability policy development for maintaining the areas of tourism interest;
- Promotion of environmental education to raise interest in sustainable tourism;
- Virtual travel as a sustainable alternative to nature tourism at locations where phys-

U istraživanju se predlaže da je motivacija potaknuta 3D vizualnim sesijama vrlo značajan čimbenik na razvoju prema uspjehu održivog planiranja turizma te priopćuje slične rezultate demonstracija gdje motivacije pokazane u sesijama VR-a mogu značajno utjecati na planiranje održivog turizma pa tako i kakvoće ishoda (Kask, 2018). Međutim, također se pokazalo da motivacije turističkih dionika za sudjelovanjem u bilo kojem dijelu održivog turizma mogu biti uvelike potaknute socijalnim strukturama kao što su interes, želja, izazov ili znatiželja. U naročito zanimljivom dijelu istraživanja opisuje se učinkovitost različitih uvjeta ispitanih putem 3D vizualizacija upotrebom hipotetskih situacija kako bi se polučilo najbolje moguće odlučivanje, što opet dozvoljava unaprjeđenje problema kapaciteta nosivosti (Lawson i Manning, 2003). Istraživanje je također pokazalo da 3D modeliranje omogućava uključivanje i sudjelovanje šire zajednice davanjem realističnijih slika i podataka čime se može olakšati i razvoj (Lawson *et al*., 2003). Održivi turizam je u osnovi proces odlučivanja, a fokusiran je na optimalnu alokaciju resursa u ograničenom razdoblju kako bi se zadovoljili svi uključeni dionici. Metode 3D vizualizacije za nadgledanje i analiziranje podataka o okolišu (El-Gayar i Fritz, 2006) naročito su prikladne za pokazivanje učinkovitosti za korisne koncepte itinerera turista, što opet može dati precizne alate za održivo planiranje.

Potom je istraživanje otkrilo različite zanimljive iskaze koje se odnose na virtualna putovanja u usporedbi sa stvarnim putovanjem i, iako predloženo kao alternativa putovanju u stvarne destinacije, virtualno putovanje doživjelo je velike kritike kod sudionika istraživanja (Kask, 2018). Istraživanje je potvrdilo, uz postojeću tehnologiju, brojne mogućnosti za oblikovanje virtualnog putovanja i izbjegavanja, makar i djelomično neke od nedostataka kojima se susreću poput manje impresija i iskustva, nedostatak veze sa stvarnom prirodom i slično. Dakako, po-

ical carrying capacities have been reached or in areas reserved for nature protection

The research suggests that the motivation spurred by 3D visual sessions is a very important factor on the path toward the success of the sustainable tourism planning, reporting similar results in demonstrations that the motivations shown in VR sessions may significantly influence the flow of sustainable tourism planning and therefore the quality of outcomes (Kask, 2018). However, it has been shown that motivations of tourism stakeholders to take any part in sustainable tourism development can be well caused by social structures such as interest, desire, challenge or curiosity. A particularly interesting research describes the effectiveness of different conditions explored through 3D visualizations by using hypothetical situations in order to facilitate the best possible decision making, which in turn allows improvements in to the carrying capacity issues (Lawson and Manning, 2003). The research also showed that 3D modeling allows larger community engagement and participation, by providing more realistic images and data which may facilitate more practical development (Lawson *et al*., 2003). Sustainable tourism is essentially a process of decision-making and it is focused solely on the optimum resource allocation in the limited time period so as to satisfy all the stakeholders involved. 3D visualization methods for monitoring and analyzing environmental data (El-Gayar and Fritz, 2006) are particularly suitable for showing efficiency in benefiting concepts of routes used by the tourists, which in turn can provide the precise means for sustainable planning.

Furthermore, the research revealed various interesting statements that refer to virtual travel in comparison with real travel, and although it was proposed as an alternative to travelling to real destinations, virtual travel was largely criticized by the research participants (Kask, 2018). The research confirmed that with the current state of technology, there are possibilities to design a virtual trip,

stoji i razlog davanja prednosti stvarnim nasuprot virtualnim putovanjima, a to je „osjećanje" stvarne destinacije.

Slična istraživanja predlažu da bi VR i virtualni turizam mogli polučiti potencijalnu strategiju za održivi razvoj turizma i planiranja; ovaj prijedlog dalje je razrađen studijom slučaja COMCOT gdje je virtualno putovanje u obliku trodimenzionalnih vizualizacija korišteno za vrijeme procesa planiranja održivog turizma (Nayyar *et al.*, 2018). Nadalje, virtualna su putovanja iskrsnula u intervjuima sudionika istraživanja kao moguća metodologija za uvođenje održivog turizma te kao alternativa za stvarne posjete prirodnim okolinama, što opet može dati rješenje za uspješan razvoj održivog turizma. Prema rezultatima istraživanja virtualna putovanja predlažu se kao posebno vrijedna turistička opcija u područjima gdje će posjetitelji vjerojatno prijeći kapacitet nosivosti osjetljivih ekosistema, kao i u slučaju masovnog turizma, što doprinosi praksama planiranja održivog turizma općenito (Kask, 2018).

IP2: Kako VR, kao obećavajući trend u turizmu i ugostiteljstvu, može zadovoljiti buduće potrebe turista?

VR nudi mogućnosti za DMO-e u komuniciranju marketinških poruka prema ciljnim tržištima i hvatanju pozornosti posjetitelja pomoću identificiranja relevantnih čimbenika koji stvaraju motivacije za ljude koji su uključeni u 3D virtualni turizam i razvoj osviještenosti budućih procesa odlučivanja o putovanju (Huanget *et al.*, 2013). S obzirom na hedonistička iskustva i emotivno sudjelovanje i posredovanje, istraživanje ukazuje da ako lokacije virtualog turizma i destinacija pruže posjetiteljima mogućnost da poboljšaju svoj pogled na lakoću korištenja, i ako se virtualni svijet vidi kao vrijedna baza informacija za planiranje puta, tada virtualni turisti imaju šanse za jednostavno ispunjenje svojih potreba za putovanjem. Raznolikim mogućnostima testiranja tehnologija VR-a može

avoiding at least partially some of the disadvantages encountered including fewer impressions, less experience, lack of connection to real nature and similar. However, there is a preference for real over virtual visits, due to the option of "feeling" the real destination.

Similar research suggested that VR and virtual tourism may be a potential strategy for sustainable tourism development and planning; this proposal was further elaborated by a COMCOT case study where virtual travel in the form of three-dimensional virtualizations was employed during a sustainable tourism planning process (Nayyar *et al.*, 2018). Furthermore, virtual travel emerged from interviews with the research participants as a possible methodology for implementing sustainable tourism and as an alternative to real visits into the natural environment, which in turn can occasionally provide a solution for the successful sustainable tourism development. According to the research results, virtual travel was suggested as a particularly valuable tourism option in the areas where visitors are likely to exceed the carrying capacity of sensitive ecosystems, as in the case of mass tourism, which contributes to the sustainable tourism planning practices overall (Kask, 2018).

RQ2: How can VR as a promising trend in tourism and hospitality meet future needs of tourists?

VR offers opportunities for DMOs in communicating marketing messages to targeted markets and capturing the visitors' attention, by aiding in the identification of relevant factors that create motivations for people involved in the 3D virtual tourism and in developing the awareness of the future traveling decision-making processes (Huang, 2013). With respect to hedonistic experiences and emotional involvement and mediation, the research indicates that if virtual tourism locations and destinations provide opportunities for visitors to enhance

pomoći u turističkom planiranju i upravljanju (Sussmann i Vanhegan, 2000). K tomu, sustav VR-a također se može koristiti kao tržišno uspješna i zabavna turistička atrakcija. Industrija zabave nastavlja igrati važnu ulogu u daljnjoj evoluciji ove tehnologije (Gutierrez *et al*., 2008). Isto tako, prednosti ovakovih VR atrakcija nad tipičnim attrakcijama tematskog parka su mogućnosti njihovog lociranja u urbanim naseljima zbog njihove male veličine (Hobson i Williams, 1995).

Još jedna moderna turistička perspektiva i njezini međusobni odnosi s marketingom, ponašanjem potrošača i potrebama turista može se uočiti serijom međusobno povezanih koncepata virtualnih svjetova i načinom na koji oni utječu na privrženost potrošača, stimulaciju i konačno na proces odlučivanja. Iskustvo, skupa s uranjavanjem, imaginacijom i interaktivnošću, omogućava tržišnim markama i turističkim organizacijama izravan utjecaj na mišljenja i odluke korisnika. Turisti će radije izabrati ovaj oblik turizma ako mogu i zadovoljiti svoje hedonističke potrebe, kao u slučaju stvarnog putovanja (Gatersleben i Steg, 2012). Štoviše, sustav VR se također može koristiti kao alat predstavljanja tržišno uspješnih i zabavnih turističkih atrakcija. Jedan je primjer vidljiv u patentu uređaja nazvanog 'Sensorama Simulator' koji je funkcionirao prema načelu ponude zabave, tj. simuliranih motorističkih vožnji kroz grad New York gdje se pružaju usluge 3D slika, zvukova, vjetra, aroma i postavljenim vibracijama (Gutierrez *et al*., 2008). Tematski parkovi naročito su zanimljivi kod proučavanja primjene aplikacije VR-a u turizmu u pogledu turističkih atrakcija i zabave; primjeri su dostupni na *Dreamworld theme park* u Australiji, koji nudi simulirane vožnje autima (Dreamworld, 2009), a koji je sličan onima koji se nude u Cyber Speedway-u u Las Vegasu (Sahara Hotel and Casino, 2009). Daljnje mogućnosti VR-a najčešće se koriste kod muzeja, područja baštine i sličnih turističkih mjesta. One se protežu od obrazovnih VR posjeta kulturnim centri-

their views on the ease of use, and if the virtual world is seen as a valuable information basis for trip planning, then virtual tourists have a chance to get their traveling needs easily fulfilled. Through distinctive testing capabilities that it precisely offers, the VR technology is able to help tourism planning and management (Sussmann and Vanhegan, 2000). Moreover, the VR system can also be used as marketable and entertaining tourist attractions. The entertainment industry has continued to play an important role in the subsequent evolution of such a technology (Gutierrez *et al*., 2008). Similarly, advantages of such VR attractions over typical theme park attractions allow theme parks to be located in urban settlements, because of their small size (Hobson and Williams, 1995).

Another perspective pertaining to current trends in tourism and its interrelations to marketing, consumer behavior and tourists' needs can be identified through a set of interrelated concepts of virtual worlds and through the way in which they affect consumers' attachment, stimulation, and ultimately the decision-making process. The experience, together with immersion, imagination and interactivity enables brands and tourism organizations to directly impact users' opinions and decisions. Tourists are more likely to favor this type of tourism if they can also satisfy their hedonistic needs, as in the case of real travel (Gatersleben and Steg, 2012). Moreover, the VR system can also be exploited as a tool which presents the marketable and entertaining tourist attractions. One example is seen in the patent of the device called 'Sensorama Simulator', which functioned on the principle of offering entertaining, simulated motorcycle rides through the City of New York, with the provision of 3D images, sounds, wind, aromas and set vibrations (Gutierrez *et al*., 2008). Theme parks are of a particular interest when observing VR applications in tourism in terms of tourism attractions and entertainment; examples can be found in the

ma diljem svijeta (Rossou, 2004), zoološkim izložbama (Bowman *et al*., 1999), proizvodnji interaktivnih putovanja (Tholos, 2009) i razgledavanja baštine (Thomasson, 2006), do izbora turističkih atrakcija na određenom području (Linaza *et al*., 2008) itd.

Jedna studija predstavlja rezutate koji se odnose na ulogu emotivnog uzbuđenja i hedonostičkog iskustva općenito kod određivanja namjera ponašanja potencijalnih turista na stvarni posjet, što je imalo za posljedicu velike mogućnosti motiviranja potrošača da postanu turisti. Na isti način se pokazalo da plovidba virtualnom okolinom u 3D utječe na pozitivne emocije i uključenost, što ima za posljedicu pozitivan učinak na namjere ponašanja i sugerira iskustvo uranjanja i većeg angažmana u vrijeme posjeta, čime se još više osnažuju potrebe turista. S napretkom virtualnih tehnologija i ulagači i potrošači uvijek se iznova oduševljavaju svime što one nude. Posljedično, ove se sve sofisticiranije tehnologije kreiraju i uvode uglavnom zbog krajnih korisnika i zadovoljavanje njihovih budućih potreba. U istraživanju se ističu sljedeći glavni trendovi u turizmu i ugostiteljstvu koji se odnose na tehnologije VR-a i njihov potencijal zadovoljavanja budućih potreba putnika (Nayyar *et al*., 2018):

- *Učinkovito planiranje i odgovarajući menadžment*. Potencijal turizma i ugostiteljstva proširio se sa sposobnošću VR-a za stvaranjem skoro stvarnih, jednostavnih i detaljnih uputa za turiste kako bi im se pomoglo u procesu planiranja putovanja i planiranja aktivnosti.

- *Učinkovit alat za okoliš*. Kreiranje različitih vrsta simulatora kojima se prispodobljuje virtualno iskustvo i omogućuje potencijalnim turistima doživljaj destinacije unaprijed.

- *Alat za obrazovanje*. Modeli VR-a koji se koriste u turizmu mogu biti od velikog značaja u početnim fazama potrošačevog ciklusa kupovine u turizmu, kao i opširnim pružanjem najnovijih informacija o važnim činjenicama i čimbenicima koji

Dreamworld theme park in Australia, which offers simulated car rides (Dreamworld, 2009) similar to those offered in Cyber Speedway in the City of Las Vegas (Sahara Hotel and Casino, 2009). The further potential of VR is most frequently exploited in the case of museums, heritage areas and similar tourist sites. These range from educational VR exhibits in cultural centers around the world (Rossou, 2004), zoo exhibits (Bowman *et al*., 1999), production of interactive tours (Tholos, 2009), viewing of heritage sites (Thomasson, 2006), selection of tourist attractions within an area (Linaza *et al*., 2008) and so on.

One study presents findings pertaining to the role of emotional arousal and hedonic experience in general in the determination of potential tourists' behavioral intentions to the actual visit, resulting in a great possibility to motivate consumers to become tourists. Similarly, it has been demonstrated that the navigation of the 3D virtual environment induces positive emotions and involvement, resulting in the positive impact on behavioral intents, and suggesting immersive experience and engagement during a visit, thus further enhancing tourists needs. With such advancements in virtual technologies, both investors and consumers of these VR technologies are repeatedly impressed with everything they offer. Consequently, these increasingly sophisticated technologies are being envisioned and implemented mainly for end-user benefits and fulfillment of consumers' future needs. The research highlights the following major trends in the tourism and hospitality industry related to the VR technologies and their potential to meet travelers' future needs (Nayyar *et al*., 2018):

- *Effective planning and suitable management*. Potential in the tourism and hospitality industry is widened by the ability of VR to create almost realistic, easy and detailed navigations for tourists to help them in their trip planning processes and their activity planning.

su relevantni za fazu potrage u procesu odlučivanja.

- *Virtualne atrakcije po stvarnim cijenama.* Stvaranje savršenog digitalnog okruženja i sadržaja može se dodati na zahtjev, ovisno o zahtjevima potrošača, čime se i dalje udovoljava svakom njihovom hiru.

- *Interaktivno iskustvo.* Moguće su virtualne ture lokacija s dodatnim bonusima za rukovanje virtualnim objektima i njihovom interaktivnošću, čime se uranja u potpuno stvarno iskustvo za potencijalne turiste.

- *Pogodne mogućnosti prevođenja.* Nude se kako bi se putnicima olakšalo prebroditi jezične barijere i razumijevanje te da se tako poveća njihov doživljaj.

- *Rezervacije soba.* Tehnologija dozvoljava potencijalnim gostima virtualne posjete sobama i razmatranje o njihovim ponudama.

- *Lokalne atrakcije.* Nude se pretpregledi lokalnih atrakcija kako bi potencijalni turisti stekli ideje o destinacijama.

Osim toga, istraživanje navodi najvažnije motivacije koje su uključene u cijeli proces VR-a kao trenda u turizmu i ugostiteljstvu kojim se zadovoljavaju potrebe i želje potencijalnih turista (Nayyar *et al*., 2018):

- Želja za nečim dru*ga*čijim i nepoznatim. Ispitivanja otkrivaju da je želja za jedinstvenim doživljajem jedna od najistaknutijih motivacija; i dakako putovanje u nove okoline prepoznato je kao čimbenik poticanja i unutarnja snaga koja tjera proces odlučivanja potencijalnog turista (Tibon, 2012). Kod izbora doživljaja, VR čimbenici odbijanja puno više prevladavaju nego faktori privlačenja zbog neposrednosti iskustva.

- *Motivacije usmjerene na sebe.* Ove motivacije predstavljaju mogućnost turista da dožive destinaciju koja ih posebno zanima, gdje bi oni potpuno udovoljili svojim željama te tako dobili poticaj za odluku o putovanju koje će smjesta zadovoljiti njihovu potrebu.

- *Effective environment tool.* The creation of various types of simulators allowing virtual experience allows potential tourists to experience a destination in advance.

- *Education tool.* VR models used in the tourism industry can be of great importance in the initial phases of the customer buying cycle in the tourism sector, and through extensive provision of first-hand information about important facts and factors relevant to the search stage in the decision-making process.

- *Virtual attractions at effective cost.* The creation of perfect digital environment and content can be added on demand depending on consumers' requirements, further aiding to their every whim.

- *Interactive experience.* Virtual tours of locations are possible, with added bonuses of handling virtual objects and their interactivity, which makes the experience immersive and completely realistic to the potential tourists.

- *Convenient translation capabilities.* These are offered to facilitate non-local travelers facing the language barriers to enhance their understanding, and increase their own experience.

- *Booking rooms.* Technology allows prospective guests to virtually visit the rooms and consider their offers.

- *Local attractions.* Previews of local attractions are offered, giving potential tourists insights in destinations.

Moreover, research suggests the major motivations involved in the overall process related to the VR as a trend in the tourism and hospitality industry in meeting potential tourists' needs and wants (Nayyar *et al*., 2018):

- *Desire for something different and unknown.* Studies reveal that a desire for unique experience was one of the most prominent motivations; indeed, traveling beyond one's normal environment has been recognized as a push factor and an internal force driving a potential tourist's deci-

- *Značajke destinacija*. Nekoliko je ispitivanja potvrdilo zanimanje za virtualna putovanja u destinacije, a za mnoge sudionike motivacije su bile prvenstveno izgrađene na mogućnosti doživljaja značajki određene destinacije i atrakcija.

- *Zamjena putovanja*. Moguća „prijetnja" koja se nameće stvarnom putovanju je njezin nadomjestak prikazan na virtualnom putovanju. Ovdje se misli na mogućnost zadovoljenja potražnje turista korištenjem VR-a gdje su potencijalni turisti zastrašeni potencijalnim geografskim barijerama i strahovima, poput straha od visine i opasnih i dalekih lokacija, itd., u određenim destinacijama te su zato voljni posjetiti ih samo virtualno.

- *Motivacije usmjerene na druge*. Za razliku od motivacija usmjerenih na sebe, kod ovih se često „postiže zadovoljstvo na temelju osjećaja da je sudjelovanje imalo pozitivan utjecaj na druge" (McKercher, 2015). Stoga je zanimanje za korištenje VR-a zbog sudjelovanja u aktivnostima ili doživljaja destinacija usredotočeno na društvene probleme, kao što je utjecaj masovnog turizma na okoliš.

Predviđa se da će VR tehnologija za nekoliko godina postati uobičajena na potrošačkom tržištu (Barnes, 2016). Stoga je vrlo važno da turistički marketing, trudeći se maksimalno zadovoljiti njihove buduće potrebe, ne samo ponudi nego i prilagodi iskustva VR-a za različita potrošačka tržišta.

sion-making process (Tibon, 2012). When choosing the VR experience, push factors are much more prevalent than pull factors because of the immediacy of experience.

- *Self-oriented motivations*. These motivations represent an opportunity for tourists to experience a destination they are particularly interested in, where they would fully indulge in their desires, thus urging them to make a travel decision that will immediately satisfy their need.

- *Destination attributes*. Several studies confirmed the interest in virtual travel to the destination, and for many participants, motivations were primarily built on the opportunity to see specific destination attributes and attractions.

- *Travel replacement*. The possible 'threat' that is imposed to the real travel is its substitute seen in the virtual travel. A chance to satisfy tourists' demands through use of VR is grasped here, as some potential tourists are intimidated by the existence of potential geographical barriers and by fears, such as fear of heights, and of dangerous and far locations, etc. in certain destinations, and thus would only visit them virtually.

- *Others-oriented motivations*. In contrast to self-oriented motivations, these tend to "gain satisfaction from the feeling that participation has had positive impact on others" (McKercher, 2015). Therefore, the interest in using VR to participate in activities or experience destinations is centered around social issues, such as environmental impacts of mass tourism.

It has been predicted that the VR technology will be mainstream in the consumer marketing within the next few years (Barnes, 2016). Therefore, it is extremely important that in their efforts to maximally meet their future needs travel marketers not only offer, but tailor VR experiences for varying consumer markets.

6. ZAKLJUČAK

Ovaj članak opisuje evoluciju i veze između istraživanih koncepata, izazova i rješenja te preostalih nedostataka. Područja primjene VR-a u turizmu i ugostiteljstvu još uvijek se razvijaju dok tehnologija ne postane uobičajena. Stoga se sve više cijene mogućnosti koje ova tehnologija pruža turizmu i održivosti kako za turističke dionike tako i za potrošače. Kod turista se naglašava zadovoljstvo virtualnim putovanjem u usporedbi sa stvarnim turizmom i rezultati su pokazali značajne psihološke razlike između sudionika u istraživanju. Kulturalne i hedonističke motivacije stvarnog putovanja i tendencija ka uzbuđenju i socijalnoj interakciji izdvojili su se kao glavni poticaji za virtualno putovanje među mnogim čimbenicima.

Važno je primijetiti da studija preporuča najveću varijablu koja ilustrira zadovoljstvo stvarnim putovanjem koja može pomoći u daljnjoj provedbi primjene održivih inicijativa. Osim činjenice da virtualno putovanje može smanjiti stvarne troškove putovanja, kao i uštedjeti vrijeme te povećati udobnost u odnosu na iskustvo održivog putovanja, turisti će vjerojatnije izabrati ovaj oblik turizma ako on može zadovoljiti i njihove hedonističke potrebe kao u slučaju stvarnog putovanja. To ukazuje na činjenicu da je održivi turizam moguć u kombinaciji virtualnog i stvarnog putovanja jer bi se tako mogao smanjiti broj turista na lokaciji kao i negativne posljedice masovnog turizma.

Uz brzi razvoj digitalne tehnologije, VR je područje koje stalno evoluira. Budući da turisti mogu unaprijed doživjeti putovanje, VR je izvrstan marketinški alat. Nekoliko studija uvrštenih u članak prvenstveno identificiraju značajke koje potencijalno potiču turiste na posjet destinacijama koje vide u VR-u, budući da ona nudi stvarno iskustvo i sadržaje kojima bi se bavili na stvarnom putu, a to opet vodi u fazu osjećaja privrženosti u kojoj bi se turisti mogli upoznati s onime što su doživjeli u VR-u. U istraži-

6. CONCLUSION

The study reveals the evolution and links between the investigated concepts, the existing challenges and solutions, and the remaining gaps. VR application areas for the tourism and hospitality sectors are still under development, while the technology becomes more mainstream, and therefore there is the increasing appreciation of the possibilities that this technology has for tourism and sustainability for both industry players and consumers. The paper highlighted tourists' satisfaction with virtual travel compared to real tourism and the results showed significant psychological differences between research participants. Among many factors, cultural and hedonistic motivations of real travel and a tendency towards excitement and social interaction were identified as main drivers of virtual travel.

It is important to note that the study suggests the major variable illustrating the satisfaction with virtual travel which may help in furthering the implementation of sustainable initiatives. Besides the fact that the virtual travel may reduce real travel costs, and the time and comfort benefits that tourists might experience during sustainable travelling, they are more likely to favor this type of tourism if they can also satisfy their hedonistic needs, as in the case of real travel. This indicates that the sustainable tourism can be achieved by a combination of both virtual and real travel, since it would ultimately reduce the number of tourists at a single location and thus the negative consequences of the mass tourism.

Alongside the swift development of digital technology, VR is an evolving area in this industrial revolution. As tourists may experience a destination ahead, VR provides an excellent marketing tool. Several studies included in the paper primarily identify the features that potentially urge tourists to visit the destinations shown in VR since it offers a genuine experience and activities they would be involved in on a real travel. This, in turn, results in the attachment stage, where tourists could

vanju se navodi postojanje nekih izazova jer neki autori vjeruju da održivi turizam treba uspostaviti ravnotežu između okolišnih, ekonomskih i socio-kulturnih kriterija. U tom smislu, istraživanje zaključuje da vizualizacije u 3D tehnici mogu služiti kao potencijalno rješenje koje bi moglo pomoći turističkim djelatnicima i ostalima uključenima u razvoj održivog turizma u postizanju širokog raspona indikatora održivog turizma, što uključuje i participativni razvoj, integraciju zahtjeva održivog turizma u planiranje procesa službenog putovanja, promjenu potrošačkog ponašanja turista i njihovo osvješćivanje. Ovi zaključci ukazuju da VR, kao trend u turizmu, još uvijek zahtijeva značajno zalaganje i poboljšanja kako bi se mogao u potpunosti uroniti u turizam, a pogotovo uključiti u rješavanje pitanja o turizmu i potencijalnom konceptu održivosti u njemu. Postoje još uvijek mnoga pitanja i prijepori, ali je potencijal ispravne primjene ogroman.

Ovo istraživanje nije bez ograničenja, a ona se odnose na oskudnu formulaciju ciljeva istraživanja, kao i raspon rasprave koja je predstavljena u članku te njezine analize. U pogledu budućih istraživanja, bilo bi korisno graditi na rezultatima ovog istraživanja u osvrtu na neočekivane spoznaje iz ove studije. Istraživanje bi se moglo provesti u novom kontekstu, lokaciji i kulturi, u odmaku fokusa na posebnu oglednu skupinu u različitom kontekstu. Teorija se zasigurno može proširiti jer je vrlo vjerojatno da će se budući radovi širiti i preispitati i vrlo je vjerojatno da će na buduća ispitivanja utjecati pojave novih teorija, saznanja i fenomena povezanih s temom ovog istraživanja.

become familiar with what they experienced in the VR session. However, the research has suggested that some challenges still exist because some authors believe that the sustainable tourism should strike a balance between environmental, economic and socio-cultural elements. In reference to this, the research suggests that 3D visualizations may serve as a potential solution which can help tourism professionals and all those involved in the development of sustainable tourism to achieve a wide range of sustainable tourism indicators, including the participatory development, integration of sustainable tourism demands into planning of travel business processes, the changing of tourists' consumption behavior and raising awareness. The present findings indicate that VR as a trend in the tourism industry still needs significant work and improvement until it is ready to fully immerse itself into the tourism sector and especially to get involved into the issues concerning tourism and the potential of sustainability concept within the industry. Many of the concerns and conflicts still exist, but the potential of right implementation is enormous.

The study is not free from limitations, and these include the scarce formulation of the research objectives, as well as the scope of discussion presented in the paper and its analysis. With respect to the future research suggestions, it would be useful to build upon findings of the research in addressing the unanticipated findings of the study. Research could be carried out in a new context, location and culture, moving the focus onto the specific sample group in a different setting. The theory can surely be expanded and reassessed, as it is very likely that future studies would be affected by distinctive new events and emergence of new theories, evidence and phenomena related to the research topic of this study.

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Prilog 1: 49 referenci generiranih za konačnu sintezu /
Appendix 1: The 49 references generated for the final synthesis

Autor / Author	Datum / Date	Naslov / Title
Kask, S.	2018	Virtual reality in support of sustainable tourism. Experiences from Eastern Europe
Shabani, N. Munir, A. Hassan, A.	2019	E-Marketing via augmented reality: A case study in the tourism and hospitality industry
Epple, C. H.	2018	Virtual reality tools in the tourism industry and their influence on booking behavior
Tussyadiah, P. Wang, D. Jung, T. H. tom Dieck, M. C.	2018	Virtual reality, presence, and attitude change: Empirical evidence from tourism
Cranmer, E. E. tom Dieck, M. C. Jung, T.	2018	How can tourist attractions profit from augmented reality?
Gibson, A. O'Rawe, M.	2018	Virtual reality as a travel promotional tool: Insights from a consumer travel fair
Kim, M. J. Lee, C.-K. Jung, T.	2018	Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model
Massi, M. De Nisco, A.	2018	The Internet-based marketing of ecotourism: Are ecotourists really getting what they want?
Neuburger, L. Beck, J. Egger, R.	2018	The 'Phygital' tourist experience: the use of augmented and virtual reality in destination marketing
Marasco, A. Buonincontri, P. van Niekerk, M. Orlowski, M. Okumus, F.	2018	Exploring the role of next-generation virtual technologies in destination marketing
Nayyar, A. Le, D.-N. Mahapatra, B. Suseendran, G.	2018	Virtual reality and augmented reality technologies for tourism and hospitality industry
Yung, R. Khoo-Lattimore, C.	2017	New realities: a systematic literature review on virtual reality and augmented reality in tourism research
Tussyadiah, P. Jung, T. H. tom Dieck, M. C.	2017	Embodiment of wearable augmented reality technology in tourism experiences
Tung, V. W. S. Law, R.	2017	The potential for tourism and hospitality experience research in human-robot interactions

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