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Chapter

Tourism 4.0: Challenges in Marketing a Paradigm Shift

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Abstract

Since the early beginnings people have been traveling and tourism industry has been always adapting to the social and technological development. In the era of digitalization, it needs to adapt again. Around 1.3 billion persons are traveling yearly around the world. Thus, a small change in this sector has a huge impact on the whole society. We propose a new paradigm, Tourism 4.0, appearing with the quest to unlock the innovation potential in the whole tourism sector. This will be done with the help of key enabling technologies from the Industry 4.0, such as Internet of Things, Big Data, Blockchain, Artificial Intelligence, Virtual Reality and Augmented Reality. By establishing a collaborative ecosystem involving local inhabitants, local authority, tourists, service providers and government, we can co-create an enriched tourism experience in both the physical and the digital world. With this, we can shift from tourist-centered focus to a tourism-centered focus around the local community. Who is the consumer in this new paradigm of tourism and what is the role of marketing in a paradigm shift? The chapter will analyze the current development and present the main shifts due to it.

Keywords: Tourism 4.0, Industry 4.0, collaboration models, new technologies, smart tourism, sustainability, economic impact, human-centered technology

1. Introduction

Although tourism is generally understood as people traveling for pleasure, it is nevertheless a complex activity that involves a number of issues that intersect over several branches in the economic and social sectors [1]. Defined by the World Tourism Organization (UNWTO) [2] as "a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes", tourism today is recognized as one of the world's largest economic sector, supporting more than 313 million jobs in 2017 and generating 10.4% of global GDP [3]. Considering the predictions of increased global growth and the unique connectedness of tourism sector, it is clear why UNWTO has recognized tourism as one of the drivers for realization of the sustainable development goals [4] and even dedicated a separate website to the promotion of the idea and mission [5]. It has long been established that short-term market success might in fact lead to the deterioration of the destinations and therefore natural environment. Sustained market competitiveness requires a balance of growth orientation and environmental commitment at an acceptable rate of return to all industry partners involved in the marketing of a destination [6].

For this reason, it is critical for future of the tourism development to adapt marketing in tourism to preserve both natural and cultural heritage. In achieving this, the appropriate use of the key enabling technologies plays the crucial role.

In this book chapter we introduce the largest government-sponsored research project in Slovenian tourism called Tourism 4.0, together with the main marketing challenges of the project itself and solutions developed in it. Slovenia is a small country located in the south of Central Europe with a long history of tourism. For instance, records of people traveling to the spas of Rogaška Slatina go back to the middle of the seventeenth century [7], while modern cave tourism in Postojna began in 1818 [8]. Hence, it is not surprising that the Tourism 4.0 partnership has been established here. Its ambition is to create a testbed in order to transform the tourism industry into an innovation-driven economy by enriching tourism experiences with the use of technology and data. The term originates from the modern paradigm in industry, known as Industry 4.0 [9] and aims to improve the added value to tourism through innovation, knowledge, technology and creativity. This is planned to affect every field around it by creating an ecosystem, in which physical and digital space, infrastructure, personnel and technology behind it merge into one seamless experience of many personalized outputs. The knowledge, expectations and experiences of tourists, defined as Tourist 4.0 in the project frame, will be utilized to build the new services and products to rise up the satisfaction with the experiences of all stakeholders in the tourism ecosystem.

By uniting managers of physical spaces in the ecosystem (towns, municipalities) with leading Slovene research and educational institutions, as well as technology experts and developers, a collaborative ecosystem is being created, which treasures the history and knowledge of tourist business and at the same time transfers it into the digital world. The result will be a new format of dynamic collaboration system among all tourism stakeholders sprouting a new generation of tourist applications and services, which are built on real tourist needs and wishes by using the key enabling technologies from Industry 4.0 harmonized with the Tourism 4.0 principles.

Subsequent to this introductory section, the following chapter is organized as follows: Section 2 provides the description of the future tourism we want to create with Tourism 4.0, in Section 3 the implementation and ambition of the project is shared, Section 4 discusses the marketing challenges as well as introduces the Twirl marketing model of a paradigm shift and in the last section the chapter is reviewed.

2. Designing tourism of the future

Tourism is ought to be an enjoyable experience for visitors, while at the same time providing a substantial source of income for many destinations and even entire countries. Unfortunately, several studies, even dating back to the 1960s [10, 11] and 1970s [12–14], have indicated the existence of many worrisome consequences of tourism. The areas negatively affected have found out to be [15, 16]:

- Environmental—increased consumption of electricity and water, extra waste production, overcrowding, reduction in accessibility, increase in population density, etc.

- Economic—increase in real estate and land price, shift from market prices to higher tourist prices [17], employment fluctuation, economic dependence on a single industry, etc.

- Social—illegal goods and people trafficking, excessive commercialization, loss of cultural identity, etc.

Since the number of annual international tourists travels has more than doubled in the last 20 years (to over one billion, shown in **Figure 1**) reaching 1323 million in 2017 [18], it is essential to ensure sustainable growth of tourism in order to avoid the deteriorating effects on both the social and natural habitat.

Many cases of extreme ramifications of tourism can put pressure on resources and the host communities, hence leading to a decline in the quality of living. All of this brought about the issue of overtourism, defined as "the excessive growth of visitors leading to overcrowding in areas where residents suffer the consequences of temporary and seasonal tourism peaks, which have enforced permanent changes to their lifestyles, access to amenities and general well-being" [20].

In 2017, Slovenia recorded more than 4.9 million tourist arrivals and almost 12.6 million overnight stays, which is 13% more than in 2016 [21]. As shown in the **Table 1**, the growth is continuous for 4 years already, with this tendency expected in 2018 and also predicted for the near future. By making a total contribution to 11.9% of GDP in 2017, with a forecast of rise to 14.5% in 2028 [22], tourism is becoming a more and more important economic activity.

The rapid rising of numbers put Slovenia ahead of new challenges. While each destination has to constantly strive to improve and innovate in order to stay competitive, local communities (not just tourist service providers and the government) must play a key role in the future development of tourism. Another issue in need to be addressed is the fact that there has been a lack of research in Slovenian tourism [23]. Existing studies pointed toward outdated business methods, lack of cooperation between public and private sector tourism managers, a low level of awareness by the government on the importance of responsible tourism practices as a major impediment in improving competitiveness [23, 24]. Fortunately, in the last years this attitude is changing and in 2017, the efforts of Tourism and Hospitality Chamber of Slovenia in the area of sustainable tourism have finally been recognized and included in the development areas of the smart specialization strategy [25]. With this action, the tourism industry has been set up alongside health and medicine, circular economy, factories of the future and others as a prospective field justified for government co-financing on research and development projects. The specific objectives aimed to be achieved are: an increase of energy efficiency in tourist facilities for 20% by 2021; an increase in the number of the fast-growing companies in tourism from 29 in 2015, to 50 in 2021; a raise in the level of knowledge and quality in Slovenian tourism and a raise in the added value in tourism for 15%.
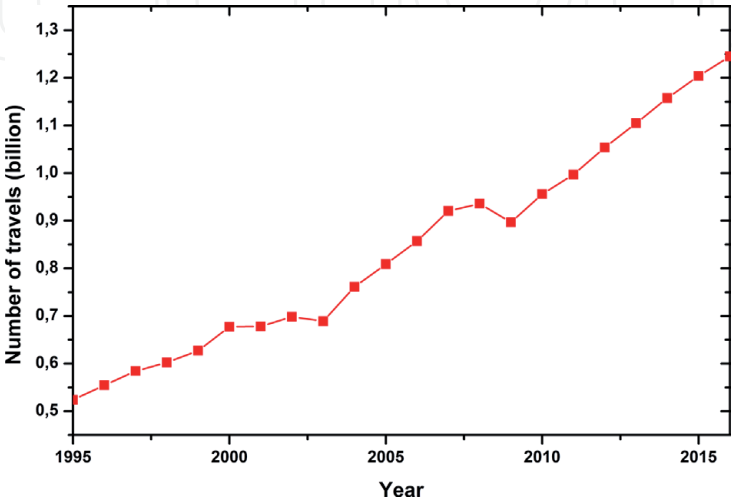

Figure 1.
Number of international tourist travels over the last decade. Source: World Tourism Organization, Yearbook of Tourism Statistics [19].

Year	Tourist arrivals		Overnight stays	
	Total	**Foreign**	**Total**	**Foreign**
2008	3,083,713	1,957,691	9,314,038	5,351,282
2009	2,984,828	1,823,931	9,013,773	4,936,293
2010	3,006,272	1,869,106	8,906,399	4,997,031
2011	3,217,966	2,036,652	9,388,095	5,463,931
2012	3,297,556	2,155,612	9,510,663	5,777,204
2013	3,384,491	2,258,570	9,579,033	5,962,251
2014	3,524,020	2,410,824	9,590,642	6,090,409
2015	3,927,530	2,706,781	10,341,699	6,614,443
2016	4,317,504	3,032,256	11,179,879	7,342,118
2017	4,948,080	3,586,038	12,591,562	8,572,217

Table 1.
Tourist arrivals and overnight stays in Slovenia from 2008 to 2017. Data taken from the SURS—Statistical Office of the Republic of Slovenia.

Accordingly, the prevailing approach needs to change. Therefore, the aim of Tourism 4.0 is to develop a model of collaboration that minimizes the negative impact of tourism, while at the same time improving the overall experience. This goal will be obtained by using the concepts and tools provided by smart tourism [26–29]—a phenomena describing the convergence of information and communications technology (ICT) with tourism experience, expanding them even further, and integrating them into a platform that will involve all stakeholders active in the tourism sector: the local community, government, tourist service providers and of course tourists—presented in **Figure 2**.

The main ambition is to build an interactive platform based on the state-of-the-art technology infrastructure, guaranteeing the sustainable development of services and products, accessible to everyone at any time. It will facilitate the tourist's integration into the destination, increase the quality of the experience and support individual's interaction to develop tailored products and services. In other words, we want to foster the leap that was enabled by high technologies from Industry 4.0 at products level, by implementing them in tourism services.

For successful implementation of the project goals, the platform will integrate four main pillars or modules, which are at the same time different areas of research for understanding the tourism ecosystem:

- Technology module. With the use of cutting-edge technologies enriched tourist experiences will be delivered. This includes:

  1. Internet of things (IoT) for enabling networks of smart device for monitoring and collecting information;

  2. High-performance computing systems (HPC) with artificial intelligence (AI) for the purpose of solving most complex challenges involving data;

  3. Virtual and augmented reality (VR and AR), which can elevate or enhance the overall experience;

  4. Blockchain solutions for a safe and transparent way of delivery.

- Innovation module. Research and development of practices and methodologies dedicated to the creation and diffusion of innovation in the ecosystem with the aim to raise the level of competences among all stakeholders.

- Ecosystem module. Understanding the tourism ecosystem and all its stakeholders in both the physical and digital world in order to create the space for the new generation of tourism.

- Application module. Enabling systems and applications that improve and enrich the real and digital experiences in tourism with the focus on mobility and services (and processes behind) for persons with the purpose of holidays, leisure or recreation, business, health, education or other.

In the Tourism 4.0 ecosystem the local community is in focus while Tourists 4.0 are very active participants in all processes. They have a direct impact on their own experience and act also as co-creators of the tourist offer. With this in mind, we should not forget that the change is only possible by data sharing of all stakeholders of a given ecosystem, thereby acting as a driver for all of the processes on the platform. Furthermore, the data need to be analyzed, if they should be turned into useful information that can be used for strategic decisions and marketing purposes, such as people flow management.

2.1 Tourism 4.0 partnership

After the initiative was launched by the company Arctur, lack of readiness level to embrace the use of the key enabling technologies, especially by small and medium enterprises in the tourist sector, has been identified. As a consequence, the partnership for Tourism 4.0 has been established to enable collaboration of any stakeholder in the world to participate in research or development of tourism of the future. It brings together a consortium of highly relevant industrial organizations, top research organizations in tourism and the leading research organizations in computer and informatics technology.
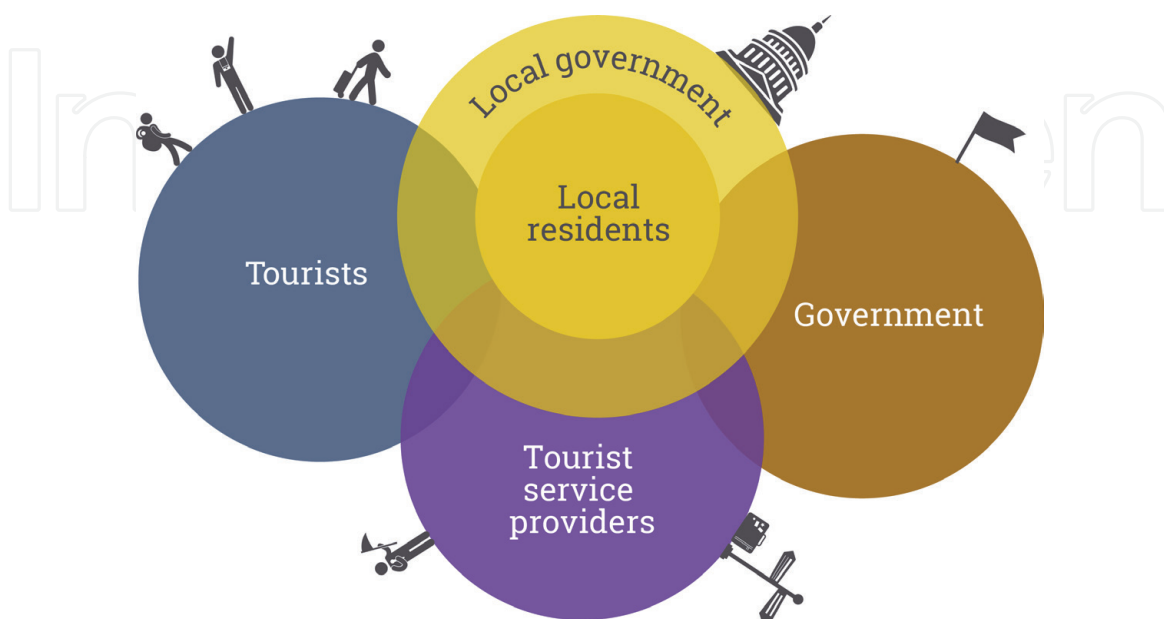

Figure 2.
The core of the Tourism 4.0 concept is to integrate all the stakeholders (local community, tourists, tourist service providers and government) in the sector within a collaborative innovation process centered around the local community.

The partnership is growing continuously and already boasts with a number of prominent members, such as Slovenian Ministry of Economic Development and Technology as well as Ministry of Public Administration, Tourism and Hospitality Chamber of Slovenia, Association of Towns and Municipalities of Slovenia, University of Ljubljana, University of Maribor, University of Primorska and many partners joining from all over the world. Not only research, also projects focused on validation and deployment of the technologies are planned in order to transform Slovenia into a testbed, Tourism 4.0 Living Lab Slovenia. Further activities in the area of Alps, Danube, Balkans and Mediterranean are set to spread the concepts to an international level.

2.2 Collaboration impact model

Sustainable tourism [30–32] is at the core of Tourism 4.0 that is aspiring to using technology to encourage a positive environmental, social and economic impact and collaboration between all stakeholders in the ecosystem. Following the slogan of Slovene tourism: 'Green, active, healthy', new ways of motivating not only individual tourists but all stakeholders will be studied in order to encourage as much of positive contribution as possible for the local environment while traveling and visiting places. This will be achieved by establishing a system of motivation and rewarding for positive behavior i.e. behavior with positive impact on social, environmental and economic elements in a destination—both from tourists and other stakeholders. In this way tourism truly becomes the driver of the sustainable development of the whole society. These are heavily dependent on the quality and intensity of communication, if they are to be reached. For this reason, marketing has a key role in this endeavor since reshaping of the tourism ecosystems with the focus on the local community will not just happen even though this is a crucial step toward the tourism of the future.

The model, that has been so far only theoretically constructed, is named Collaboration impact model (CIM). For its implementation certain tools need to be developed to help with collection, understanding and integration of data. This includes data such as weather prediction, traffic density, number of tourists in a defined area, energy consumption in tourism, etc. In an interactive way, through gamification, we want to reduce the negative and encourage the positive behavior and promote positive attitude to inspire more responsibility among citizens of the globe. The CIM model will use the data of the ecosystem to help tourists with suggestions for tourist activities. When using this model, the tourists will receive real-time information and recommendations based on their own profile, which will help them decide, for example what places to visit or what activities to partake in. Furthermore, users will be able to switch between their own avatars since interest of tourists vary significantly according to their purpose of traveling, which is not limited to for business and pleasure only.

Collaboration impact model is supported by several technological solutions. The most impactful one is the creation of digital tokens, a boosting and rewarding tool of the positive impact accomplished through collaboration within the ecosystem T4.0. In our proposed system, they are named after the model and thus called collaboration impact tokens (CIT). The currency will be needless to say developed on the basis of the blockchain technology. These tokens will be awarded to stakeholders of the tourism ecosystem as incentives for performing certain actions that are beneficial to the local economy and environment. They could help preserve and promote cultural heritage, reduce the consumption of natural resources and support an effective dispersion of tourism.

Examples of CIT awarding are shown in **Figure 3**. However, there are many more. With this mechanism, responsible development of ecosystem is enabled by encouraging positive attitudes, using of more ecologically-friendly transportation and stimulating a more favorable allocation of tourists. The latter is a pressing issue as more and more destinations are struggling with negative consequences of over-tourism. In the next step, we plan to go further and integrate attitudes that encompass most different aspects of society and include them in the rewarding system. For example, visiting elderly people and spending time with them for few hours or reporting a damaged public trash bin to the municipality could be encouraged by incentives in the form of tokens. We believe that step by step with the technological development as well as by raising awareness through strategic communication rewarding positive impact on wider society will become the norm.

Anyhow, visitor management techniques can also be applied to select or deselect tourists, control their flows and influence their behavior through promotion and education [33]. With the help of internet of things, it is possible to monitor and thus measure many human activities. The most common example in the tourism sector is the water and energy consumption of each accommodation. Many hotels collect such data but they do not use them. In accordance to our collaboration impact model, the tourists, who exhibit ecologically conscious behavior, i.e. consume less than average consume of water and energy of tourists in that specific area, would receive a reward in the form of CITs. The received tokens can be used for purchase of other tourist products or services. In addition to increasing the sustainably driven attitude preserving the environment is this beneficial for the local economy. Another example of desirable
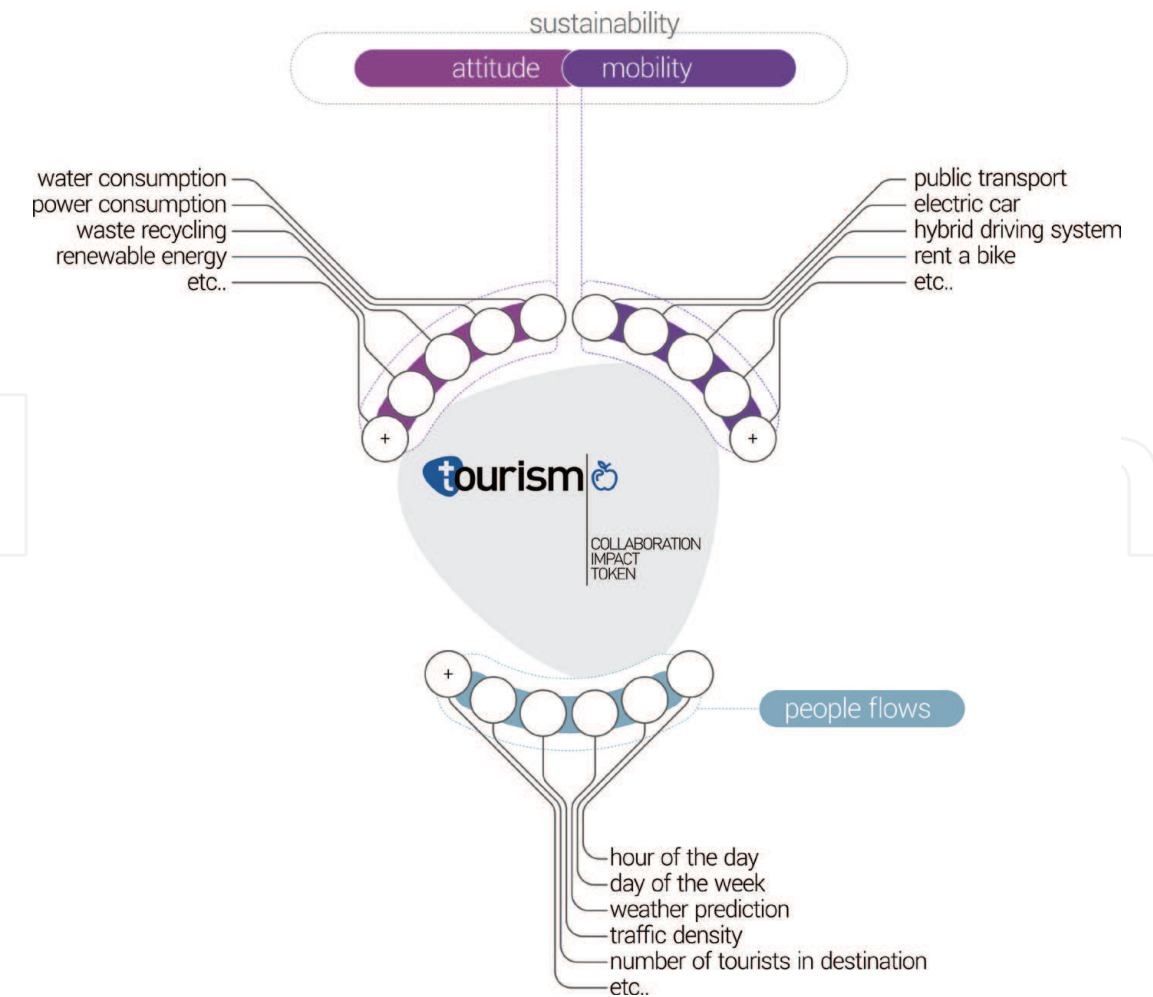

Figure 3.
Examples of methods and actions with which a tourist can earn the collaboration impact token—CIT and the attitudes we want to promote.

behavior is visit during the low tourist season or places in the touristic periphery. An additional issue of significant importance due to the size of its impact is the mobility. Here good behavior is determined and rewarded by the use of public transport or sharing services besides renting a bike or an electric car. The underlying idea is that tourists are awarded and thus motivated to exhibit behavior with a positive impact more often.

The most important aspect of the collaboration impact token is the assignment of dynamic values according to location and time of its use. For an illustration, we examined the number of tourists' overnight stays for each municipality in Slovenia in 2017 and normalized it to the municipality's population density (residents/ km^2), as seen in **Figure 4**. The discrepancy can be noticed immediately. Some areas experience a much higher tourist density than others, with some parts already experiencing overtourism. The value given in the calculation is dependent on:

- visits to the geographic area—lower in the red and higher value in the green areas;

- tourist season—low season means higher value;

- strategic development level of the region—higher value in less developed regions;

- etc.

As the example of the calculation demonstrates, the use of public data can already enable the first insight into understanding of tourist flows. Building an award-based collaboration ecosystem that helps to manage issues of people flow within a destination, region or even a country is very rational and strategic since it also supports less developed regions in establishing their touristic sites. By implementation of the CIT that provides instant award in discounts, tourism of the beaten path can rise significantly. This does not only reduce the unbearable crowds of tourists in one spot of a destination, but above all immensely improves the tourist experience.
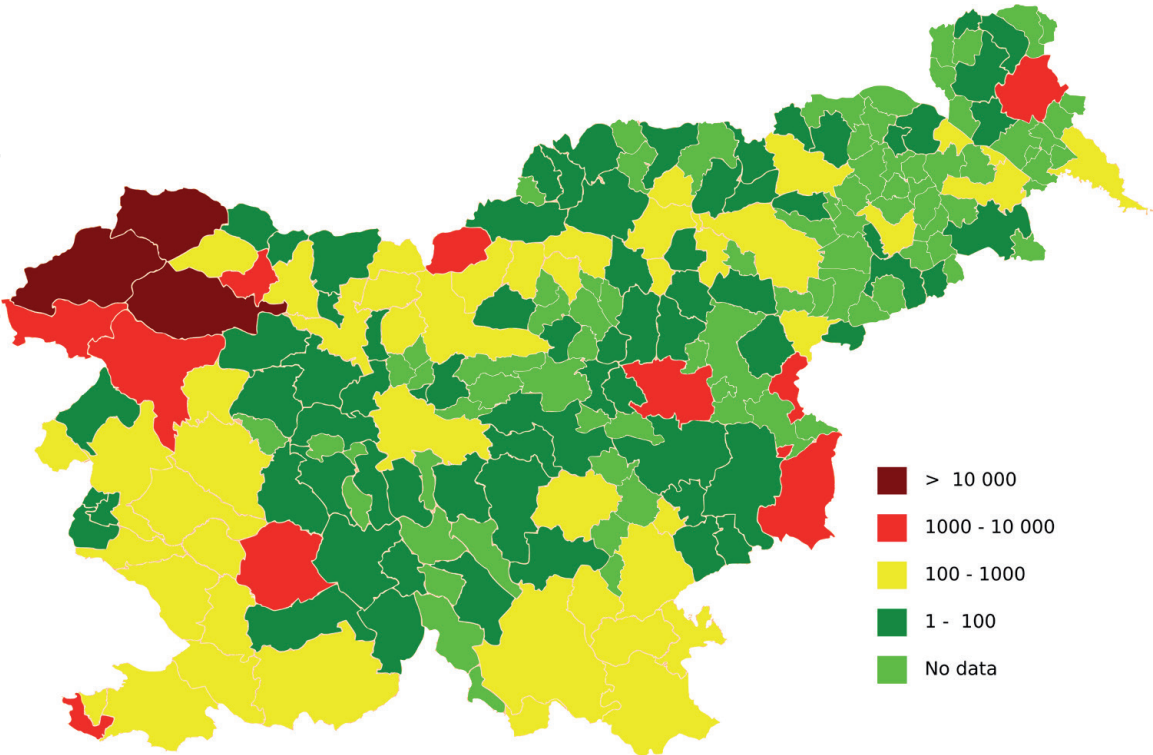

Figure 4.
The number of tourists overnight stays in 2017 for each municipality normalized by its population density (i.e. residents/km²). The data is taken from the SURS—Statistical Office of the Republic of Slovenia.

3. Implementation and ambition

It is the lack of capital, technology and marketing and management expertise that restrains the growth of tourism in many less developed regions in the world [33]. An adoption of societal marketing strategies will thus have to take place, where increased visitations are not the primary concern and visitors are not treated like any other commodity. This will include monitoring of both the tourist and host satisfaction for the purpose of optimizing the of tourism impact on the environment and consequently increasing the benefits for the local community [34, 35]. Since monitoring is dependent on data, access to them is increasingly relevant to the tourism sector as well. It allows for the provision of evidence-based decisions and the development and analysis of future scenarios, which infuse the whole sector with additional efficiency and productivity to face its current challenges. In addition to accessibility, green mobility and connectivity has been identified as a priority area for facilitating the flows of movement, and easing the negative impact of tourism on local environment, along with reducing the effect on climate change.

Moreover, the prevalence of smartphones and mobile devices are swiftly changing the face of technology use for destination marketing as people now have access to the virtual world in palms of their hands [36]. More importantly the new technology enables smaller and peripheral destinations to compete on equal footage with larger and more central ones. The gained competitiveness lies in reduced dependency on intermediaries for the distribution of tourism products. As a consequence, the providers of tourism services are able to improve their negotiation power, which fosters the development of a healthier distribution mix. As aforementioned, this is of even greater importance for remote, peripheral and insular destinations where local principals and authorities have a great dependency on tourism for their income but lack expertise and resources to undertake comprehensive marketing campaigns [31].

Only an advanced ICT infrastructure enables a more dynamic, less rigid, and fast interaction within organizations and between organizations at the tourist destination, which empowers stakeholders through the creation of a technological infrastructure for increased communication and collaboration [34]. Tourist destinations are now, more than ever, building competitive tourist places using state of the art business models. However, without a proper information environment these business models are often subjected to failure. The T4.0 platform facilitates the just-in-time information exchange between various stakeholders from different places or markets using the key enabling technologies available at this time (illustrated in **Figure 5**). This way, the platform reduces the information and choice overload, which currently presents one of the key barriers in conducting tourism business. What is more, various tourism providers can use the platform to share their services, products or information to users at all levels of the industry (e.g. G2C, B2B, B2C, C2C).

The Tourism 4.0 platform actually enables the communication between stakeholders and collaboration within the ecosystem where users are involved in the development of new tourist products and provide free access to the collected data, thereby encouraging innovation through the use of modern technology. In the implementation of technological solutions of Tourism 4.0, local communities play a vital role, thus we are putting them at the center of the ecosystem of future tourism. As already presented in **Figure 2**, the Tourism 4.0 platform is envisaged toward four main target audiences:

- The providers of tourism services and packages (e.g. local tourist organizations and tour operators). The interest of this group is in the direct access to their target audiences, which will be enabled through the platform. There is a number of niche web (and mobile) platforms that almost proverbially offer only one solution to the end user (e.g. only hotel reservations, only attraction

tickets, etc.). Contrarily, the Tourism 4.0 platform will gather together a number of various but complementary proposers of tourist services that will be interested to promote through the platform due to the considerably reduced margin for the referred business.

- The tourist. They will be encouraged to use the platform mainly because of its all-in-one portfolio and also its embedded features. The combination of an all-encompassing offer, accompanied by AI will enable the platform to produce a tailored offer to the user. The AI will have an overview of the interests and preferences of the end-user and the services at offer. By combining the two, the user will get offered first the most interested services for her or him in that moment followed by services listed accordingly to their relevance for the user.

- Local inhabitants. Through the collaborative platform, it will be possible to measure, monitor and manage the impact that tourists have on the local environment. This can be used to control the quality of living of the population and the quality of the tourist experience of the guests. In a second step also measuring of attitudes of local inhabitants are planned to be included in order to incentives all stakeholders to strive for the positive impact.

- Government. Providing a collection and aggregation of data that can help in understanding and development of appropriate policy regulations, which are not only able to react to disruptions but even boost innovations.

In understanding the ecosystem in such way, a question emerges on who is the consumer in this new paradigm of tourism, as every stakeholder is collaborating, profiting and co-creating. These are the challenges that need to be embraced by the marketing specialists in the near future.

Actually, from the technological and business aspect, tourism and e-tourism have always been in the background, in the sense that tourism was predominantly following innovation. In the latest technological wave, many of the most prominent startups and corporations of the new generation are strongly attached to tourism, mainly through sharing economy. Sharing economy is just the beginning of a trend that indicates how the technology allows the sharing of tangible and intangible elements of all kinds of user experiences, in tourism as well. The tendency will continue with the intensive incorporation of all other current trends (AI, VR, AR, IoT, Smart Mobility, Blockchain, etc.). It will not only be about new ways of sharing and building up these elements. For the economic sector, it is important that these elements are appropriately used in new, innovative business models. Therefore, the technological project outcomes will be
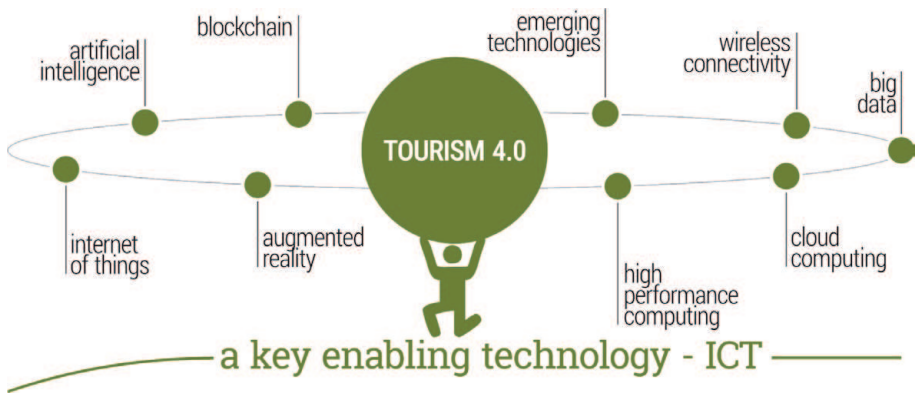

Figure 5.
The enabling technologies for project Tourism 4.0.

adopted to the new and innovative business models in tourism in general, as well as in the areas of destination management and event management.

Here are some examples of the use of the key enabling technologies in tourism that will transform the tourism business in near future:

- Virtual reality could help potential visitors to decide which destination they prefer to visit;

- Augmented reality could enable a completely new touristic experience that is either historically informative or adventurous in nature;

- Combination of external data such as weather forecast with travel information would implement an automatic rebooking of a trip in case of a rainy day.

Such and similar future applications could become a new income stream in tourism, especially in relation to natural landmarks since most of them can be experienced for free. We do not promote limited access to nature because access to it should stay free of charge. On the other hand, interactive experience offered via augmented reality app could be payable and the income acquired could be spent on preserving the nature in a given destination. This way we would not rely solely on demand management for sustaining tourism resources with effective marketing, which can channel tourist flow to places that are more impact-resilient, such as urban and seaside built environments rather than to more fragile wilderness areas [33]. With the income from the enriched tourist experience national parks and heritage sites would be able to invest into preservation of natural environment in addition to managing the ever increasing demand.

In fact, the sustainability of local resources is becoming one of the most important elements of the destination image, as a growing section of the market is not prepared to tolerate over-developed tourism destinations and diverts to more environmentally advanced regions. The degree of consumer satisfaction will depend on the assessment of the perceived overall experience of the destination versus anticipated expectations and perceptions [34]. Smart tourism will become the driver of social change due to its high innovation potential and above all impact on economic, cultural and natural environment. As explained, marketing has a crucial role here. Not only in promoting sustainability in tourism but also in marketing in an attractive way of less popular tourist destinations. Inefficient use of many tourist facilities (hotels, for example, often have annual bed occupancy rates of 50–60% in most countries), indicates that the effective marketing of these tourist resources is of great significance in reducing resource wastage as well [33]. Challenges and opportunities are many, especially because throughout the world tourism services are offered by small and medium tourism enterprises, which tend to be family managed. Hence, the challenge for destination management organizations is to provide leadership in the development of innovative products and create local partnerships for the delivery of seamless experiences [34]. The collaboration impact model can provide that but marketing and communication experts will need to develop new strategies to make better use of the new tools with the purpose of optimizing the positive impact of tourism while increasing the benefits of the local community.

4. Challenges in marketing Tourism 4.0

In marketing of new concepts, such as a new paradigm, the first issue everybody is facing is how to build trust and rise interest for complex and new solutions

since trust and perceived risk are shown to be direct antecedents of intention to transact, suggesting that uncertainty reduction is a key component in consumer acceptance [37]. Hence, it is crucial to be aware of the lack of readiness level of the target groups in terms of lack of skills and lack of processes, in which research and development spirit could fit into strategies and implementation of changes.

To address this, the Twirl marketing model of a paradigm shift, presented in **Figure 6**, has been developed that shows in which process the appropriate target groups were identified and how the nature of communication has been growing into collaboration. In this process the communication starts with the informative phase addressing a broad public. It is upgraded in the second step with educational dimension that focuses on a smaller target group, which is then in the third step reduced to the key persons of each specific target group. With them conversations take place in order to find the possibilities to embrace the new concepts. This leads to collaboration, with which the amount of people reached via informational, educational and conversational communication raises again. In the best case, such organic growth occurs through community building. This is the reason for establishment of the Tourism 4.0 partnership, which is open to new interested stakeholders.[1] In addition, an online form is available on the website, where anyone can share their idea or solution in the field of Tourism 4.0 and are later connected to potential partners.

How does the Twirl marketing model of a paradigm shift prove to work in practice? In the informative phase all available tools to spread information are used, such as digital presence (website with news section for updates, social media, newsletter, etc.) and participation or organization of events with good media coverage or specific to the topic performed. This enables the reach of the appropriate target groups. Tourism 4.0 as a new paradigm has been presented both at events organized locally and around the globe, in China and Mexico for example, but always accompanied with good national media coverage.[2] The goal was to awake interest and give it relevance through international dimension. In the second phase, education in the form of presentations at conferences, forums[3] and fairs were given in order to provide knowledge of the paradigm shift and its necessity while getting experts and policy makers in the tourism sector acquainted with the Tourism 4.0 objectives. To achieve this, concrete examples of technologies were presented in the form of vivid storytelling.[4] The play of concepts around marrying tourism with technology has been created to help novices with low to limited knowledge of technology to embrace the new concepts and possibilities they bring.

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[1] Joining the Tourism 4.0 Partnership is simple via an online form (https://www.tourism4-0.org/en/join-us/) and has no preconditions or restrictions.

[2] For example media coverage on the National RTV (https://4d.rtvslo.si/arhiv/prvi-dnevnik/174547134, https://radioprvi.rtvslo.si/2018/06/turizem-4-0/) and the only daily Slovenian business and financial newspaper (https://izvozniki.finance.si/8933310/Googlu-bi-Arctur-in-slovenske-univerze-odrezali-kos-torte-v-korist-slovenskega-turizma?cctest&cookietime=1525669980). The panel on Tourism 4.0 at the 31st Bled eConference also attracted much attention from the media in Slovenia (https://www.tourism4-0.org/en/news/2018062610122048).

[3] Media coverage from European Forum Alpbach (https://svetkapitala.delo.si/aktualno/slovenija-s-turizmom-4-0-predstavljena-v-alpbachu-6374) and Strategic Forum Bled (http://www.sloveniatimes.com/technology-will-completely-transform-tourism-panel-hears).

[4] See an example of a keynote speech from 1 minute 15 seconds. Available from: https://www.youtube.com/watch?v=W4BgwFrWV54&fbclid=IwAR0DWdinudMJeBB3XJpS6m0AVguDOZtaWPK5Mmtq4B5F7i8sHQ3rtQhhaQo

Figure 6.
Twirl marketing model of a paradigm shift.

From persons targeted during the education phase some individuals, small groups and organizations showed interest for a further conversation, which is the activity of the third phase of the Twirl marketing model of a paradigm shift. This phase includes personal conversations with tourist organizations and institutions and service providers. At the same time, deep conversations will take place through an extensive survey conducted as a part of the Tourism 4.0 research project that include local and national authorities, tourist organizations and tourist providers. The goal is to understand the current state and technology readiness level in the tourism ecosystem in Slovenia and to discover its innovation potential to develop the Tourism 4.0 collaborative ecosystem. For this reason, concrete tools such as guidelines for development of Tourism 4.0 ready multimedia contents, portal, archive and reservation system[5] have been published to help the key persons include the new concepts into their strategies and implementation. The importance of providing relevant information in the future tourism marketing environment is also evident in the literature. In the scientific contribution on Tourism Marketing in an Era of Paradigm Shift the dimension of information knowledge proves to be crucial for the future tourism marketing and is added to the standard time and place dimensions of the old way of thinking because only available information can turn tourists into value co-creators, competitors into potential partners and even marketers to learning facilitators [38].

Only after informing the public, educating specific target groups and conversing with key decision makers an inclusive collaboration at a local or global level is possible. In the marketing model of a paradigm shift after performing the first 'round of process' further marketing strategy builds on an eternal interviewing of all communication methods from the first three phases for multiplication of collaboration. However, the precondition remains the trust of all stakeholders, which is being built by interaction that hopefully grows into collaboration. This interactivity is enabled by the modern tools for tourism marketing and management that can re-engineer the entire process of developing, managing and marketing tourism products and

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[5] The guidelines in Slovene. Available from: https://www.tourism4-0.org/mma/priporocilat4_0_v0_1pdf/2018121908553371/?m=1545206133

destinations as well as provide the competitive advantage with the ability to re-develop the tourism product proactively and reactively [39].

Therefore, the next step of the Tourism 4.0 project marketing strategy is testing of above-mentioned solutions with a series of products at TRL 6–8 stage.[6] The goal is to test the prototypes in operational environment to support commercial activity in ready state in environments called living labs, where future reality and future tourism in it are simulated. Imagine a playground in which technology service providers can test their gadgets with tourists, who want to be part of such a testing experience accepting the violations of their privacy. At the same time, public decision makers can learn from the reality and adapt the legislation accordingly. Students, waiters and all other personnel in contact with tourists get the possibility to train how to deal with crypto tokens while children will be educated about their water consumption and challenges that we as citizens of the world are facing and how to behave to minimize our negative impact. Key to the marketing a paradigm shift is to understand that the marketing process needs to address all stakeholders. To mention the most crucial fact, we are aspiring to facilitate the break down the silos mentality where stakeholders do not wish to share information and provide feedback with one another. Such trials will connect consumers (both local community and tourists) and tourist providers, (local) government as well as high-tech companies in order to unify the dispersed ideas, experiences, knowledge and expertise with the intent of integrating them in a collaborative manner around the Tourism 4.0 platform and later used in real business environment.

5. Conclusions

With more than one billion persons traveling yearly around the world, a small change in this sector has a huge impact on the whole society. The new paradigm, Tourism 4.0, build around technologies from Industry 4.0 can path the way of transformation not only in tourism, but also as driver of the UN sustainable development goals. In Slovenia, the biggest research project on tourism in the history of the country called Tourism 4.0, which has already grown into a Tourism 4.0 partnership, gathering academia, business and public partners, is focused on defining the ecosystem, in which these changes could take place. Hence, the main objective is the development of a platform for a new form of active cooperation system among the local community, tourists, tourist service providers and the government.

The system aims to encourage positive behavior among all stakeholders in order to maximize positive impact on the local environment through the collaboration impact model. For its implementation certain tools need to be developed to help with collection, understanding and integration of data. This includes data such as weather prediction, traffic density, number of tourists in a defined area, energy consumption in tourism, etc. In an interactive way, through gamification, encouragement of the positive behavior and promotion of positive attitude to inspire more responsibility among citizens of the globe is foreseen. Digital token, to mention the most impactful one, is a boosting and rewarding tool of the positive impact accomplished through collaboration within the T4.0 ecosystem. The so-called collaboration impact tokens (CIT) is a currency developed on the basis of the blockchain technology. These tokens will be awarded to stakeholders of the tourism ecosystem as incentives for performing certain actions that are beneficial to the local economy and environment. In addition to gamification and incentives, social marketing strategies promoting sustainability and positive impact will be used.

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[6] Technology Readiness Level. Available from: https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

The Tourism 4.0 ecosystem is built around the problems and wishes of local inhabitants and in only in the second step around those of other stakeholders. Hence, we are facing the shift from tourist-centered focus to a tourism-centered focus around the local community. During the development of such an ecosystem a question emerges about who is the consumer in this new paradigm of tourism as every stakeholder is collaborating, profiting and co-creating. As the right answer due to the collaborative nature of the Tourism 4.0 ecosystem is *everyone*, the Twirl marketing model of a paradigm shift emerged. The model leads to collaboration through the process of finding the right partners that bring new collaboration and help spreading the messages and ideas of the paradigm shift. This occurs by first addressing the broader public, educating the appropriate target groups via innovative marketing tools and event presentations at various conferences, forums and fairs, where interested individuals and organizations are found. This leads to personal conversations with them aimed at finding common goals and their implementation into strategies and actions plans. In this way an environment in which collaboration can emerge and grow is created. And this is the beginning of the story of a new paradigm shift which might have or not, depending a lot on communication and marketing experts, a huge impact on our future.

To conclude, such an ecosystem does not only provide immense opportunities for technological innovation and new business models but also represents an extremely rich environment for identifying and studying new interaction paradigms and forms of value (co-)creation. The stakeholders interact with information and with technologies in new ways that have yet to be identified and understood, the challenges that need to be embraced by the communication and marketing specialists in the near future.

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Conflict of interest

The authors do not declare any conflict of interest.

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