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RESEARCH ARTICLE

New Technologies in the Field of Tourist Guiding: Threat or Tool?

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Abstract

This article examines the impact of new technologies on the field of tourist guiding. It has been found throughout the preliminary research that a large gap in this field exists in academic literature. It is therefore important to study the role of the tourist guide in this era of emerging technologies, both in and outside the museum spectrum, to better understand the future place that tourist guiding will have in the tourism industry. Different types of new technologies are examined in relation to the field of tourist guiding, and the various benefits and limitations of these technologies are also discussed. It can be argued that only when embracing the positive aspects of both new technologies and tourist guiding can one offer tourists the best experience in the digital age. This realisation can greatly impact the way in which tourism managers design tourist experiences and tourist guides interact with both technology and tourists.

Keywords

Tourist guide, New technologies, Apps, Smartphones, Virtual tours

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Introduction

In this 21st century, one cannot deny the importance and development of new technologies in almost all aspects of our lives, especially in the tourism industry. It brings into question the impact that these new technologies will have on the future of the tourism industry, and more specifically, the future of tourist guiding. The purpose of this article is to examine the impact that new technologies may have on the tourist guiding industry. The different types of new technologies that are being used today are also discussed. The benefits and limitations of mobile applications, in particular, are looked into. The general consensus is that new technologies can be a very useful aid in the tourism industry; however, there are limitations to these new technologies as well. Further studies into the effects of new technologies on the tourist guiding industry will be needed to fully understand the future of the tourism industry with these new technologies. For the purpose of this article, new technologies include technologies that have been developed mostly in the last two decades. Since academic literature that focuses on the impact of new technologies mostly base their attention on new technologies in museums, examples in this study also greatly make use of examples found in the museum industry amongst others in southern and South Africa.

There are a few concepts that are used throughout this article. These include *tourist guide*, *new technologies*, *apps*, *smartphones* and *virtual tours*. These will need further clarification to understand the context these concepts are used in.

There have been many attempts at defining *tourist guide*. The Oxford dictionary (1933: 490), for example, defines a tourist guide as: "One who leads or shows the way, especially to a traveller in a strange country; spec. one who is hired to conduct a traveller or tourist." Another definition is given by the World Federation of Tourist Guide Associations as "[a] person who guides visitors in the language of their choice and interprets the cultural and natural heritage of an area of which each person normally possesses an area-specific qualification usually issued and/or recognised by the appropriate authority." (World Federation of Tourist Guide Associations, 2012).

New Technologies is linked to advances in computer technology. For the purposes of this article, the concept *new technologies* is used in the context of information technology and the use of new technological devices in the tourism industry. *Application,* in the context of this article, refers to "a program or piece of software designed to fulfil a particular purpose" (Oxford English Dictionary, 2017). A *mobile application* will then refer to software programs for the specific use on mobile devices, such as *smartphones*. Applications are sometimes also referred to as just *apps*. The concept *smartphones* is defined as "a mobile phone that performs many of the functions of a computer, typically having a touchscreen interface, Internet access, and an operating system capable of running downloaded apps" (Oxford English Dictionary, 2017).

Virtual tours can be divided into two concepts. *Virtual* refers to something that is "not physically existing as such, but made by software to appear to do so" (Oxford English Dictionary, 2017). *Tour* is defined as "a short trip to or through a place in order to view or inspect something" (Oxford English Dictionary, 2017). A *virtual tour* can then be defined as a computer-based tour that allows users to visit a place or museum without being there in person. The virtual tour simulates a real tour by making use of interactive 360˚ video software.

Brief Background on the Roles of the Tourist Guide

Tourist guiding is one of the oldest activities in the world (Cetin & Yarcan, 2017, 345-357). Tourist guiding has become a fundamental part of the global tourism industry. This is the case with both tour leaders and tourist guides (the former leading the group from their place of origin and the latter who meets the tourists at the destination (Cohen, 1985: 6).

Cohen (1985:10) provides two spheres of the roles of tourist guides, namely the leadership and mediator spheres. The leadership sphere involves the roles that the guide has to fulfil in terms of leading his/her group, as well as providing access to certain areas. There is a social element involved as well in the leadership sphere. This element is the responsibility of the guide to provide social unity within the group. The mediator sphere has to do with the guide being a cultural broker, or mediator, between the tour group and the local community (Alrawadieh et al., 2020: 53; Cohen, 1985: 10).

In recent years, the use of new technologies has started to take over the traditional roles of the tourist guides. Some technologies could be placed in the leadership sphere and others will fall into the mediator sphere, depending on whether the new technologies impact the way in which tourists are led at a destination, or help bring them in contact with the local community. Some technologies may even cause an overlap between the two spheres.

The Use of New Technologies

Many scholars, who look at the future of tourist guiding, mention the impact that new technologies will have on the industry. For example, Weiler and Black (2014: 167) state that "the advent of technology in both the marketing and the delivery of experiences is also having profound impacts throughout the tourism industry."

Apart from the new technologies used in the tourism industry to improve the experience of tourists, there are other ways in which technologies impact global tourism. Knowledge about the tourism destination is accessible to tourists even before they travel. The Internet, for example, can provide tourists with most of the

knowledge they need, even before they arrive at the destination. This will inevitably pose a few challenges for tourist guides at these destinations, who have to guide tourists who may feel they know everything already. Tourism operators promote the skills, experience and qualifications of the tourist guide as a way of establishing an advantage, not only over the competition, but also as an advantage over the use of non-guided tours that some tourists prefer. Of course, the advantage that guides have will depend on the tourist group catered for. The Internet has also made it possible for tourists to easily review tourist guides, sites and tour operators at no cost to themselves. Websites such as 'TripAdvisor' offer this service. This increases the competitive challenges that tour operators are facing (Weiler & Black, 2014: 167).

Weiler and Black (2014: 167) elaborate on new technologies that are used at the tourism site, as well as *en route*, to aid the visitors' experience. They mention that a consequence of these new technologies can be the emergence of the perception that these new technologies can overtake the role of the tourist guide. These roles include language translation, direction information, general service information, commentary and interpretation. Many digital guide books exist for use on smartphone devices. Nokia, Apple, Android and Google are just some of the mobile operators that have designed mobile guide books (Weiler & Black, 2014: 167).

Types of New Technologies

Mobile Applications

Background on the Development of Mobile Applications

After museums started experimenting with audio-tours, certain museums adopted digital mobile guides in the 1990s. This started from simple audio tours providing information to the tourists as they are moving along the tourist site, to multimedia devices that provided video as well as audio. These have also become location-aware. These were quite attractive devices for museums, since they could be tailored for the specific group of visitors that the museum receives. One such project was the HIPS/HIPPIE (Hyper-Interaction within Physical Space) project in Europe in 1997. The Computer Interchange of Museum Information initiative in 2002 started to look into mobile devices, and stated that in the future, these devices could also possibly serve as virtual guides; electronic maps; a means of communicating with the museum; and as a tool to access gift shops at museums (Economou & Meintani, 2011: 1-2).

Since 2009, some museum-oriented mobile phone applications were released. Today, the area of smartphone applications, or apps, is rapidly expanding. Museums see smartphone applications as a means of reaching a new audience that they were previously incapable of reaching. Smartphones have now evolved into powerful

devices with large screens, fast and reliable Internet access, with a variety of input capabilities and strong location-awareness functions (Economou & Meintani, 2011: 2-3; Wang *et al.*, 2014: 2).

"With the increasing number of users and greater incursion into people's life, smartphones have the potential to significantly influence the touristic experience" (Wang *et al.*, 2014: 2). There are a variety of different apps that all serve different purposes — even overlapping in some purposes. Two of the main type of mobile apps that fulfil the roles of the tourist guide and the tour operator are apps that provide guided tours of popular cities and apps that put itineraries together for tours (Reed, 2015: 1).

Smartphone apps can now provide tourists with a range of information and services, for example services surrounding major tourism activities, such as planning, navigation and reservation. Even minor services are available, which include services such as locating fuel stations nearby and waiting time for rides, for example. Thus, the needs of the traveller can be addressed at any time (Wang *et al.*, 2014: 6).

There are many tourist guiding apps available, as will be discussed later in this article. There are also mobile applications available for specific tourism services, such as the 'Gautrain App', for Gautrain services in the Gauteng province, South Africa; 'Flapp', a flight services application; and even a 'Kids Aid App', which helps users in dealing with emergencies with children. These are all apps developed in South Africa (Houston, 2015).

It is becoming increasingly popular for museums and other tourist sites to encourage users to use their smartphones, instead of renting an audio device, or something similar. This is because the use of smartphones is very cost-effective for museums, since they do not need to purchase their own devices. This is also beneficial for tourists, since they would know how to operate their own smartphones, instead of having to learn how to operate another device.

Examples of Mobile Applications in Southern Africa

The 'FNB Namibia Pocket Guide' application was launched after its pilot run in 2013. This app is important for the tourism industry since it collects needed data and improves customer service in the industry. This app allows users to search for different tourism experiences in Namibia, as well as the best places for nearby tourism services, such as accommodation and restaurants. Users are able to share photos of their travels and share their experience of Namibia through the app. The app also makes it possible for people to rate tourism service providers. It also contains important information such as emergency numbers and maps of Namibia. This app was designed to help local tourism establishments and assist the developing national

tourism of Namibia. Figure 1 shows a screenshot of the app (Daily Southern African Tourism Update, n.d).

The 'Madiba's Journey' application was launched in 2015, and enables tourists to visit the main attractions associated with former South African president, Nelson Mandela. These sites include Robben Island, where he spent 18 years of his 27-year term in prison. The app is designed to make "walking in the footsteps of Madiba" easier. The app is GPS-enabled and is aimed to enhance the experience of tourists visiting sites relating to Mandela (AFP Relaxnews, 2015).

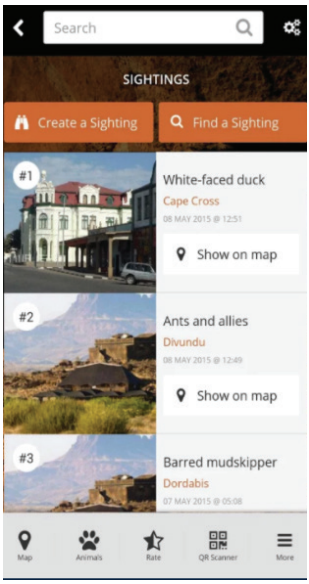

Figure 1. FNB Namibia Pocket Guide (Intouch interactive marketing, 2017)

Examples of International Mobile Applications

A quick search on the Internet will make it clear that there are a variety of tourist guiding apps available to tourists across the globe. International Internet companies, such as Google, also have their own tourist-based mobile applications. One such example is the 'Google Trips' app. This app allows users to receive notifications whenever they walk by a point of interest. These points of interests can include tourist attractions, but also well-reviewed tourism service providers, such as restaurants. Through the search engine Google, tourists can quickly find a lot of information on specific tourist attractions (Price, 2015).

'Google Trips' is an example of a mobile application that not only shows points of interest to users, but also works out trips and itineraries for them — something that a

tour operator normally does. Figures 2 and 3 are advertisements of the app as found on Google's app store. One can see how the app works out tours for users in Figure 3, using Google Map technology (Google Play, 2017).

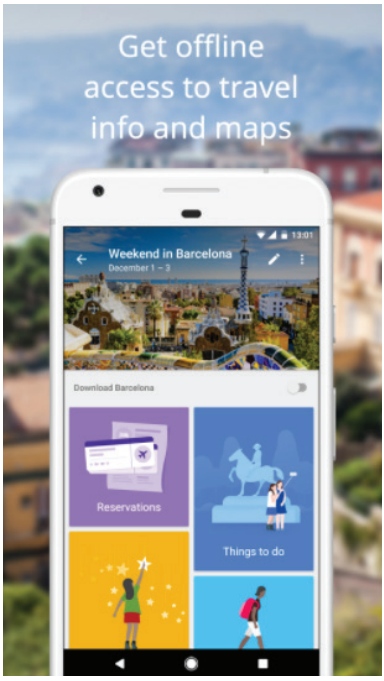

Figure 2. 'Google Trips' (Google, 2017)

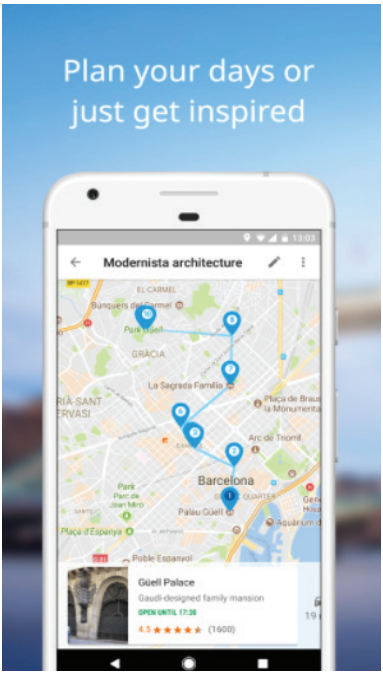

Figure 3. 'Google Trips' (Google, 2017)

Another example of a similar app is 'Stray Boots'. This application also points tourist in the direction of interesting attractions and sites, but also has a bonus 'scavenger hunt' feature, which challenges tourists to try new foods or partake in some tourist activity. It has sixty different self-guided tours available in popular cities such as Copenhagen and Paris (Price, 2015). Some apps are combining history with tourism, by providing users with historic information of their current location, such as 'History Pin'. This app is provided through a non-profit organisation, powered by Google and makes use of both submitted photos, taken by tourists, as well as archival material (Price, 2015).

Benefits of Mobile Applications

The benefits of mobile applications have not received as much academic attention as the general use of technologies in museums. *The Tourism Update* has published an article written by Reed (2015) on the benefits that mobile applications can have for

the tourism industry. The information that apps deliver is often well-researched and likely to be correct. It depends on how they were designed, but if they are correctly set-up, apps can provide the correct content consistently. Apps are also cost-effective. Apps can provide users with a range of content that is relevant to the particular tour, or tourism site. These applications can also provide an overview on the background of the tourism site, and can provide a perspective on why the site is relevant (Reed, 2015: 2-3).

A great benefit of apps is their ability to aid self-drive travellers who like to plan their own travels, independent of tourist guides and operators. Apps also allow visitors to travel at their own pace, which they most likely would not be able to do in a guided tour group. Apps allow tourists to modify their tours. For example, they can skip certain points of interest that they do not want to visit, and add other points of interest which may not be included in guided tours, due to possible lack of interest and time constraints (Reed, 2015: 3).

"Anything that aids and enhances the visitor experience is a good thing." (Reed, 2013: 3). Apps can cater for visitors of all ages and encourage interaction between family members. Apps can also provide services to a large number of tourists, where this is not always possible for tourist guides who usually have a limited number of people in a guided group. Apps also have the benefit of being available in a wide range of languages (Reed, 2013: 3). Dickenson and other authors argue that apps have in a way made it possible for tourists to escape from the time constraints of their everyday life. They can now access opening times easier and also read through resources of attractions at any time. This has really opened up the tourism industry from being time-constricted (Dickenson *et al*., 2012).

A big advantage of smartphone applications is the possibility for tourists to share their experience on social media platforms. Tourists can also receive feedback on their shared travels and comments. This allows tourists to connect with other travellers and therefore form a larger overview of the site and its attractions. Tourists feel a sense of excitement when they are able to share their travels with friends and family (Reed, 2015: 4).

If one reads the reviews of some tourist guiding apps, one can quickly discover how many people benefit from the apps on their personal trips. Some of the more stellar reviews of the Google Trips app included one person commentating that: "This app makes everything so easy! It's great to have all my reservations at one place. I love that it has so many recommendations for attractions and food. This app has everything you could ever need…" and another saying that the app is "Just like a virtual assistant." Of the poorer reviews, most are about the technical aspects of the apps (such as bugs found with the apps and features they would like to have on the app). One reviewer states that the Madiba Journey App is a "beautifully conceived,

well executed tourism tool." He also states that he looks forward to using the app as he tours South Africa (Google Play, 2018).

From these reviews one can see that users view these applications as useful in their travels. As mentioned, most of the lower-star reviews are suggestions on how to improve the applications. From this one can gather that more people would likely use applications if they are well-designed. There is very little talk of the impersonal nature of apps as opposed to making use of real-life tourist guides (Google Play, 2018).

Limitations of Mobile Applications

There are, however, limitations to what apps can offer tourists. Many scholars seem to agree that tourist guides offer a 'richer' experience for tourists. Aspects such a tourist guide's ability to add his/her interpretation to a site are of great value to many tourists. Tourist guides can offer personal interaction, with the possibility of tourists to interact with the local environment. This is something that tourists are increasingly seeking, and which tourist apps cannot necessarily provide. Things that you can derive from tourist guides, and not apps, include: experience, charisma, personality, and the personalisation of tour experiences. Some scholars argue that although apps can provide tourists with a lot of technical information, it is the narrations of the tourist guide, and his/her way of transferring this information through his/her personality and enthusiasm, which really add value to the information that tourists receive (Reed, 2015: 4-5).

From a South African perspective, tourist guides also have a distinctive advantage over apps. The people of South Africa, with their diverse range of cultures, are part of South Africa's attraction. A tourist guide is then an ideal way for tourists to experience the rich cultures, by receiving information through a local who understands the cultures. The personal interaction with local people that tourists can experience through tourist guides can be seen as even more interactive than mobile apps. Most leisure tourists want to interact with the local communities in some way. By purely interacting with technological devices and automated processes, the travel experience may be quite dull and sterile (Reed, 2015: 4-5).

Another limitation that apps may have is their ability to answer questions, and follow-up questions. Apps can have a wide range of information, but specific questions, which tourists may wonder about, are not necessarily covered by an app. On an economic note, tourist guiding provides, often much-needed, jobs to the local community. Tourist guides are also often trained to handle real-life situations, such as medical emergencies, which apps cannot handle (Reed, 2015: 5-6).

Because of the connection that tourist guides, in most cases, have with tourism service providers, they are more able to help accommodate special requests of tourists

and are therefore excellent problem-solvers. Apps are not always able to handle special requests in terms of tourism services. Tourist guides are able to read tourists better and change the tour to match the needs that tourists may not even realise they have (Reed, 2015: 6).

Limitations to apps that provide maps to tourists have been highlighted by the Tshwane Tourism Association (TTA) in the Gauteng Province of South Africa. According to the TTA, their research has indicated that most people who travel still like to hold a physical map, as opposed to using an app where you have to scroll around to see the map. Tourists also do not necessarily always have Internet access while travelling. This is why the TTA decided to launch a physical map (see Figure 4) of the Tshwane area in 2016, as opposed to developing an app (Daily Southern African Update, 2016).

Figure 4. Physical map of the Tshwane area (Tshwane Tourism Association, 2017)

Figure 4 shows only a section of the physical map. Already, one can notice an overload of information given to the tourist. An app can categorise the information with specific links to certain information sections to make it easier for tourists to find the information they are looking for. The printed version of this map would be quite big. The argument that the physical map, as opposed to an app, is available to people without an Internet connection can be debated, since one has to visit the

Tshwane Tourism Association website to get a PDF version of the map. Not all apps make use of an Internet connection when in use. One does, however, need an Internet connection and a smartphone to download an app.

The Benefits of Mobile Applications In Comparison to Tourist Guides

The table below provides a comparative analysis of mobile applications and tourist guides as provided by Reed (2015).

Table 1
Benefits and Limitations of Mobile Applications (Reed, 2015)

Benefits of mobile applications	Benefits of tourist guides
Information provided is correct	Tourist guides can offer a richer experience
Cost-effective	Employing local guides can have positive economic benefits for the local community
Provides range of relevant information	Mobile applications often lack personal interaction with the local community which tourist guides offer
Provides overview of background of tourist attraction	Tourist guides can answer questions and anticipate follow-up questions
Aids self-drive travellers	Narrations of tourist guides can add meaning to a tour
Visitors can travel at their own pace	Mobile applications often lack personal interaction with the local community which tourist guides offer
Caters to large number of visitors, can be presented in a variety of languages and can cater for different age groups	Most tourist guides possess a certain personality and charisma
Encourages interaction between group members	Tourist guides are able to assist in physical emergencies, such as performing CPR.
Since opening times and other resources linked to attraction are easily accessible, tours are not as time-restricted	Tourist guides have the ability to handle special requests regarding tourism services
Other benefits of mobile applications relate to the possibility of visitors to share their experiences on social media, with their friends and family.	

Virtual Tours

Virtual tours had their origins in the 1990s with the launching of various CD-ROMs, such as Apple's 'Virtual Museum'. The user was able to navigate through sites such as art galleries on a computer screen by using a computer mouse. This raised many questions among scholars about authenticity and how technology might threaten and impact on the authentic experience of tourists, often contextualised by the tourist guide. There are a few distinctive features of virtual realities in terms of museums. One is that they allow access in real-time and are available to multiple users at the same time. This can essentially be done from any computer in the world with Internet connection and has therefore far-reaching accessibility advantages. Users all over the world can now have access to visual information about the museum (Huhtamo, 2013: 121-122; Jackson, 2010: 154-155).

There has been an attempt by international museums, mostly in developed countries in North America and Western Europe, to achieve the notion of a 'museum without walls'. This essentially entails the information that the museum has to offer to be available to both on-site and off-site visitors. Museums have also started incorporating the abovementioned mobile apps in achieving the wall-less museum (Arvanitis, 2010: 170).

South African Tourism has started to make some attempts in incorporating virtual reality into the tourism sector. In 2016, South African Tourism hosted a pop-up experience, 'Find your wild', where tourists could experience certain South African tourism attractions such as shark cage diving, and penguin spotting at Boulders Beach — all by making use of 360° virtual-reality technology (Benjamin, 2016).

Social media platforms, such as Facebook, have been used in countries like South Africa, to showcase the ability that virtual-reality technology has on promoting tourist attractions of a country. Virtual-reality videos posted on platforms such as Facebook, have received a great amount of positive feedback. This can be witnessed in the campaign 'South Africa: A 5-minute holiday'. Filmed entirely in South Africa, the campaign produced 5 short 360 ° videos of South African sites, posted to the Facebook page of South African Tourism. The videos have had over a million views, as well as thousands of positive comments (Visualise, 2016).

Here one can note the emergence of the post-museum. Many scholars argue that the museum industry should move away from the 19th-century perception that museums are confined to a building where only factual information is transmitted through the voice of the curator. Instead, the post-museum incorporates multiple voices and embraces subjectivity, where knowledge is constructed rather than only passed on (Arvanitis, 2010: 171). One of the most prominent museums that do have a virtual tour on their website is the Vatican Museum. The information of the museum is transformed into a commodity that can be moved outside the confines of the museum building (Arvanitis, 2010: 170; Musei Vaticani, 2017).

According to the American Association of Museums (AAM), museums should "represent the world's natural and cultural commonwealth" (Muller, 2010: 295). This is often not possible due to many historical artefacts being stored away safely in museum archives and storages. Many of the world's heritages are thus inaccessible to tourists. This can be seen in the example of Da Vinci's painting 'The Last Supper'. The painting has become a virtual painting, since almost everyone has only seen pictures of the painting, and not the actual painting itself. Thus, virtual representations make heritage accessible to users who would not have been able to experience it otherwise (Muller: 2010: 295). The question and debate about authenticity, however, still remain.

Google has extended the use of new technologies to the education sector. With Google's 'Expedition' initiative, teachers can take their classes to historic sites such as the Colosseum, or the Taj Mahal, without leaving the classroom. This is done by making use of virtual-reality headsets and smartphones. In 2017, Google made the app available to the general public as well. Now individuals can tour over 600 tour locations, all from the comfort of their own home. They only need to buy a headset, since many tourists already own smartphones. Virtual-reality headsets are slowly becoming more affordable as well. On a South African online shop, one can purchase a headset for about R250. There is also a group tour option, where individuals can connect with other users over Wi-Fi, and with the help of an Internet connection, a guide then provides tours to the users. Figure 5 shows how an underwater tour would look by using the Google 'Expeditions' app with a virtual-reality headset (Matney, 2017; Takealot, 2017).

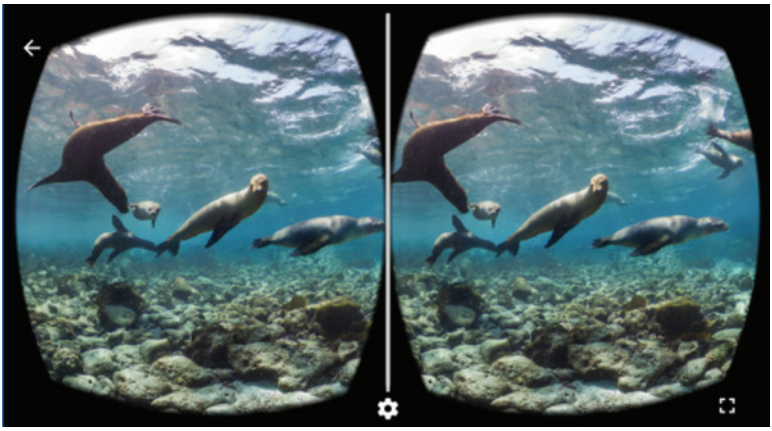

Figure 5. 'Google Expeditions' app (Google, 2017)

Museum Gaming Apps

Museum gaming apps have been used by a few museums in developed countries, such as the United Kingdom and the United States, to encourage empathy among tourists, relating to the museum's field of interest. The increase of usage of these types of games correlates with the increasing gamification of cultural objects. Gamification refers to "the growing trend for activities and environments not traditionally understood as video games to take on their mechanics, structures and rewards systems." (Kidd, 2015: 2). These games have been used to engage and keep the attention of interested parties. There is also an attempt by these games to create

affective empathy. Affective empathy is defined as "…the capacity to respond with appropriate emotion to another's mental state" (Kidd, 2015: 3). The main objective of these games, alongside the facilitation of empathy, is to encourage learning: Learning about historical events, learning about museum collections, and even learning how to modify one's behaviour in the world (Kidd, 2015: 2-3, 9). Examples of these museum gaming apps include: 'High Tea' (Welcome Trust, UK), 'The Beatle's Game' (National Museums, UK), 'Great Fire of London' (Museum of London, UK), 'Dressed to Kill' (Tower of London, UK) and 'Before the Boycott: Riding the bus' (National Civil Rights Museum, US) (Kidd, 2015: 4).

By using the first-person perspective in games, the characters in the games can deepen and affect behavioural patterns. The player of the game can really see the historic event through the eyes of the people who lived through it. If, for example, the person playing the game has a willingness to take responsibility for another character, the person can gain that willingness to take the responsibility of another person in real life as well. These benefits are contested by various scholars and are not seen as definite. Empathy has, however, been found to be an important factor in facilitating the learning experience of a person. It can also lead to less social conflict and the diminishing of prejudice (Kidd, 2015: 5-7).

Personal Digital Assistants

Personal digital assistants (or PDAs) are small portable screens that provide information to visitors and motivate interaction by tourists through a touch screen. These PDAs can provide text files, as well as multimedia files including video and audio files. The information is given on the screen, while audio is provided through headphones. These PDAs are especially popular in some art galleries. The Cutlery Museum, an art gallery in Spain, is using these PDAs in the museum. The Los Angeles County Museum of Art has also installed PDAs for the use by visitors to the museum, which can be seen in Figure 6. Visitors can then categorise certain museum objects as 'favourites' on the device, and the museum will then email information about these specific objects to the visitors. A limitation of these PDAs, and in all probability other similar devices, is that it does not encourage discussion between tourists. Tourists cannot interrupt the transfer of information to give their own opinion or interpretation (Nelson, 2009; Tesoriero *et al*., 2007: 351; Vom Lehn & Heath, 2005: 6, 9).

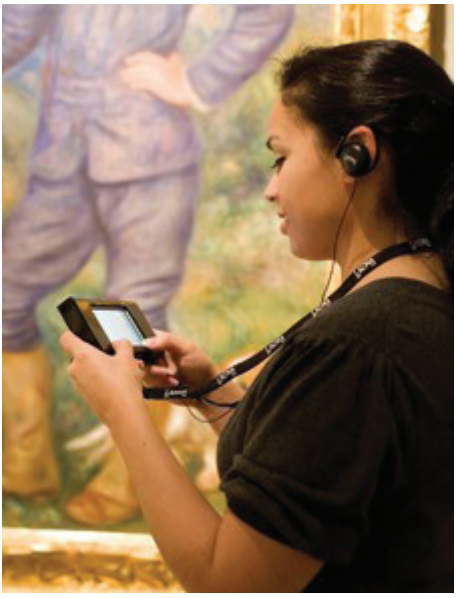

Figure 6. PDA used by Los Angeles County Museum of Art (Nelson, 2009)

QR Codes

Quick Response or QR codes, link to the field of mobile tagging. Mobile tagging involves the use of one's smartphone to connect physical objects (for example, artefacts in a museum) to virtual information found through an Internet connection. 2D codes are placed near, or on, certain objects. Using specialised software on one's mobile phone, one can then 'scan' this code which will then link to the relevant webpage. QR codes are used for marketing purposes, providing user-relevant information, and for attaching info to certain buildings and objects. QR codes can be used at the tourism site and in museums, as well as in souvenir shops located at tourism sites. In the tourism industry, QR codes can link tourists to a downloadable PDF document which contains relevant information about the tourism site, or be used to provide information on objects, including historical backgrounds. QR codes can also make use of location-based information to provide tourists with information regarding their specific location. QR codes are also applicable for use on tickets, instead of the usual barcodes, which are often problematic. For example, QR codes are not as sensitive to level surfaces such as normal barcodes (Canadi *et al.*, 2010: 4-5, 9-10).

In South Africa, QR codes have been implemented at tourist attractions such as the Voortrekker Monument in Pretoria/Tshwane (Gauteng Province). In the Cenotaph hall, one can find QR codes located under the marble frieze panels, in the Hall of Heroes. Visitors can then scan the codes, and receive more information

on the individual panels. These QR codes can be seen in Figure 7 (Voortrekker Monument, 2017).

Figure 7. QR Codes used by the Voortrekker Monument (De la Harpe, 2015)

The town of Mossel Bay in South Africa has launched its own QR-code tour. These codes have been placed at various locations at the Bartolomeu Dias Museum Complex. The vice-chairperson of Mossel Bay tourism, Ray Murray, commented on the new technology that has been implemented: "The future is with us; it is in the new technology, and if you don't embrace it, you will be left behind." (Mossel Bay Advertiser, 2012). It seems that South Africa welcomes new technology in museums, even if the progress is slow and can only be seen in certain technologies thus far.

QR codes are very popular in international tourism. Certain tourist sites are making use of online encyclopaedias, such as Wikipedia, as the linked sources of QR codes. Monmouth in Wales was the first town to have these Wikipedia-connected QR codes implemented. Even smaller territories, such as Gibraltar, are becoming 'Wikipedia-towns' as the town is dotted with QR codes, linking tourists to online information about specific attractions. Since websites such as Wikipedia are available in a number of languages, the information provided to tourists can be in the tourists' preferred language. This is just one of the many benefits that tourism operators see in the use of QR codes (Moskvitch, 2012).

Benefits of the use of QR codes include a fast increase in handling experiences and also the flexibility advantages of mobile applications. Limitations include the fact that users have to download software to scan QR codes. These QR scanners are, however, easily accessible and there are a number of applications to choose from. Another limitation is navigating through what may be a lot of information about the tourism site, for the specific information that the tourist is seeking. Internet availability and the cost of maintaining Internet connections are also limitations to the implementation of QR codes (Canadi *et al*., 2010: 6, 16).

In-Ear Translator

The 'Pilot' system is developed by Waverly labs in the United States, and is an in-ear device that can translate any language immediately for the user. The device is still only available for pre-ordering, but it is a ground-breaking invention that may significantly change the tourism industry. It is a gadget that can easily fit into the user's ears and translate any language that the user is hearing in real-time (Gould-Bourn, 2016).

Benefits of the Use of New Technologies

Weiler and Black (2014: 167) mention that the use of new technologies has made it possible for people who are mentally and physically differently-abled to travel. Wang and other authors (2014: 5) state that the use of technology and mass media can add significant value to the mediation process in the tourism industry. The Internet, especially, mediates tourism to a greater degree, since it provides interactive possibilities for the media, as well as its audience. The Internet can also show people, by using both visual and audio aids, what certain tourism destinations look like, and might even encourage people to visit these places (Wang *et al.*, 2014: 5).

Limitations to the Use of New Technologies

Vom Lehn and Heath (2005: 14) state that many methods that scholars use to measure whether or not new technologies are beneficial for museums are not adequate enough. An increase in visitor numbers, or an increase in time spent at an object, is not enough to convince scholars of the efficiency of these new technologies. This is in particular reference to the use of PDAs and information kiosks (Vom Lehn & Heath, 2005: 14).

Vom Lehn and Heath (2005: 15-16) provide a few suggestions that museums should keep in mind when implementing new technologies, such as information screens.

1. Portable devices should not be for one specific person, but designed to be shared between tourists.
2. Display technology should make participation of multiple users possible.
3. Screens with information should be positioned to make it possible for people to see it from different angles.
4. The content on the device should refer back to the artefact so that users will interact with the artefact ***and*** the device, and not only with the device.
5. The content on the device should encourage discussion between tourists about the exhibit.

A further possible limitation to the use of mobile apps in a museum environment is that the interesting technology may overshadow the actual exhibits (Economou & Meintani, 2011: 15).

Conclusion

There are various new technologies being implemented at museums and other tourist sites all over the world, including South Africa. These new technologies include mobile applications for smartphones, virtual reality, PDAs, QR codes, museum games and devices such as the in-ear translator. There are certain limitations to these technologies, but the benefits of the use of these technologies are hard to ignore. These technologies are used in different ways, but are all implemented to enhance the tourism experience. To better understand the future of the tourism industry, and tourist guiding specifically, one will need to understand these new technologies better. With the increasing number of tourism apps and other technologies, there is no escaping the flood of technology on the tourism industry. A harmonious relationship between new technologies and the tourist industry will have to be established in order for tourist attractions to benefit from these technological tools, without devaluating and threatening the attraction itself, its authenticity and the unique role of the tourist guide in the tourist experience.

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