Novel features of interactive augmented reality advertisements and its effect on stimulating user engagement: study of Egyptian tourism advertising

Dr. Shimaa Salah Sadek
Lecturer, Advertising Department, Benha University, Egypt
shimaa.salah@fapa.bu.edu.eg

Abstract:

Modernity features, technological advances and economic conditions have added new challenges to the world of advertising and tourism promotion. In accordance with the current intelligent era and its special features, it requires technical development in the presentation of attractive tourist advertising ideas so that Egyptian tourism advertising campaigns are unique and different. It became necessary to find an effective interactive way to establish a close relationship with potential users for the purpose of motivating the potential user and to make it an authentic party that shares his senses in the advertising process to consolidate his relationship with advertising and thus the tourist service and achieve the elements of attraction and engagement. According to the development of the properties of interactive augmented reality technology and its unique features in creating a built-in environment that penetrates the spatial and temporal boundaries where the advertising designer was able to embody the worlds of tourism accurately in addition to many distinctive qualities such as interactive quality and dazzle and others, which helps to dipping the user with the advertising experience. The research used this technology as one of the dazzling tourism advertising solutions that help in effectively embodying the Egyptian tourism reality for users. This study follows an experimental approach using two ads implemented with AR technology and two traditional ones for testing two aspects: firstly, the capability to interactively integrate AR into tourism advertisements (ads) using a smartphone to increase the rates of user engagement over those of traditional ones; and secondly, the effect of an interactive tourism advertising experience on enhancing the novelty principle, This study proposed that, H1: the interactive integration of AR in tourism advertising using smartphones leads to higher rates of user engagement. H2: the impact of an augmented tourism advertising experience enhances the novelty principle. The results indicated the effectiveness of such interactive AR technology for increasing the user engagement rates and enhance the novelty principle.

Keywords:

novelty; augmented reality; user engagement; tourism advertising

Introduction

The interactive nature of AR imposes special determinants on the course of an advertising process in order for users to benefit from its characteristics that are unfamiliar to them. The exploitation of smartphones for advertising and interactively marketing services in an era in which accessing social networks is one of the daily routines of users, is considered one of the most prominent topics in the advertising literature. Also, in attempts to strengthen their relationships with users, advertising companies and organizations not only display ads and

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measure their effects but also seek to form special connections with users that are difficult to break. According to increases in the rates of competitiveness among companies, technological developments and users' levels of mentality and intelligence, the term 'User Engagement' has become one of the most important ones in the advertising literature. Therefore, the quest to satisfy a user's intelligence and respect his/her desire to become a self-interacting party in the advertising process has become one of the most critical considerations. Consequently, the prominent role of interactive technologies that require self-intervention from users to fulfil their requirements as well as their inherent right to run the advertising process in their own way has evolved. It enables a user to interact using the method he prefers and even provides him with the freedom to decide on the time he wants to spend on an advertising experience compared with participating with his peers.

Recently, the popularity of AR technology and its different uses in the advertising field has increased due to its effective visual impacts. Accordingly, marketers and advertisers have shown great interest in it because it adds realism, three dimensions, interactivity and novelty features to an ad. These characteristics can be used to display and, in particular, promote significant monuments as they enable a user to have high levels of free interaction, such as zooming in and out to see all the details of a monument which are not available in traditional forms of advertising while interactions with real monuments are prevented in order to preserve them. It also increases an ad's dimensions that enhance its strength and add characteristics to the spatial borders of a user (the expected tourist) to enable him to visualize and appreciate the sanctity and importance of such monuments and artefacts through augmented, three-dimensional (3D) realistic images of them that are very similar to their actual presence in the real physical environment of the user at the time of his experience.

This study, which uses AR technology in tourism advertising, offers an ideal and efficient alternative to tourist convoys that depend on antiquities being moved abroad for the purpose of promoting tourism to enhance the economy of a country. It is important for advertising's role of promoting ancient monuments that document the history of humanity through the ages and highlighting their sanctity and global status.

Tourist convoys have many limitations and require several security, archaeological and ministerial approvals because their effects may be detrimental to significant attractions. As they may damage or steal artefacts, especially those that are rare and highly valued and forbidden from leaving the country, they are often rejected on security grounds. Therefore, the use of AR technology is considered a powerful marketing and potential advertising alternative to these convoys (e.g., Egyptian archaeological tourist ones) for promoting tourism and considering national and international economic security.

As the main role of advertising is to attract tourists and, consequently, improve countries' economies, it is imperative to adopt new mechanisms for advertising and promoting tourism in a way that can encourage people to visit other parts of the world. Therefore, in the current era of smartphones, using technology in tourism advertising offers a range of opportunities to create greater interest among potential visitors. The possibilities provided by AR technology to promote tourist landmarks allows users to maintain a high level of knowledge of the world and share their past experiences. According to the marketing and competitive challenges of encouraging people to visit Egypt currently being faced by the tourism industry, immersing a user in advertising in an augmented interactive environment that embodies Egypt and promotes

its tourism is a catalyst for positive user behavior if it offers large levels of realism, interaction and fun.

Today's tourism advertising faces many challenges, including competitiveness among marketing destinations. Holloway argued that, in many countries, tourism promotes the economic growth of a country and raises its standard of living by creating jobs and attracting investment. However, research on the use of AR to promote urban heritage tourism is limited (Hassan and Ramkissoon 2016).

Many researchers of tourism advertising have claimed that the tourism industry has become more competitive and destination marketing is a challenge for obtaining an advantage. Although using modern technology is crucial for many destination-marketing organizations (Han, Jung and Gibson 2014), information-driven approaches still lack the aspect of interacting it with tourists. Therefore, AR has become the buzzword for modern technology which, in turn, is witnessing rapid development and application in many industries (e.g: Wrenn 2012; Han, Jung and Gibson 2014). However, despite its effective capability to reconstruct archaeological information (Vlahakis et al. 2001), its use for advertising tourism is still not sufficiently well understood to provide a valid model for its implementation (Han, Jung and Gibson 2014) although it provides a user (prospective tourist) with indirect experience of a real attraction. Developments in the world's smart number have led to the implementation of strategies for promoting effective technology based on those in the field of advertising which had to adopt modern digital technologies. As it has an effective capability to immerse a user in an advertising environment, AR is essential, especially in a world characterized by generations of social networks.

Researchers are interested in the types of actions a user takes in an AR environment when given the freedom to manipulate what is displayed in the augmented content. This may require downloading special applications for smartphones and using them to control displays on AR screens because such an advertising campaign involves a higher level of user self-interaction which generates a sense of independence and is relevant to the advertiser. Compared with many innovations, AR applications offer a user fun and useful experiences due to the rich and high-quality nature of virtual information that blends perfectly with the user's real world and saves him looking for information separately (Leues, Dieck and Juuy 2014).

The unique interaction between a user and advertiser in an augmented ad framework also characterizes this technology (Feng & Mueller 2018) which is important as it adds a new competitive dimension and has become important for tourism advertising and marketing organizations (Hassan and Ramkissoon 2016).

Based on the novelty principle, many modern advertising studies have shown increasing interest in AR as well as the additional features that affect users' responses in an ad's interactive environment. As a user feels that such an ad respects his privacy and provides him with the option to interact as he wants, it indicates his attitude towards it. Due to the spread of smartphones which have become companions and necessities for users globally, there is a possibility of linking augmented advertising experiences with phone applications. However, the paucity of scientific research has limited our knowledge of the impact of AR technology and the effect of AR advertising via a smartphone on user engagement.

Therefore, will the interactive integration of smartphones with AR lead to higher user rates? And enhance the novelty principle? **Research has tended to answer these questions (Statement of the problem).**

The purpose of this study is to examine two aspects.

Firstly, we practically test the capability of the interactive integration of AR in tourism advertising via smartphones to increase user engagement rates.
Secondly, we determine the impact of augmented tourism advertising on enhancing the novelty principle.

The research hypotheses are:

H1: the interactive integration of AR in tourism advertising using smartphones leads to higher rates of user engagement.
H2: the impact of an augmented tourism advertising experience enhances the novelty principle.

Originality/ value:

This research provides a technological solution based on interactive augmented reality technology to stimulate user engagement to create greater interest among potential visitors and promoting Egyptian tourism in a contemporary way, and studying the novelty effect of the experiment. Also, this study represents is considered a powerful marketing alternative and potential advertising alternative to tourist convoys (e.g., Egyptian archaeological tourist ones) for promoting tourism.

Literary framework

Augmented Reality (AR) Technology

AR technology is one of the most important modern technologies in the global advertising sector. Its qualities, characteristics and distinctive dimensions increase the likelihood of it largely dominating markets in the near future. It is interactive, intelligent, dazzling and novel which gives it power to attract users. Specifically, augmented phone advertising is an ideal means of promoting the tourism sector through non-traditional environments that can provide useful information about it (Emmanouilidis et al. 2013).
Therefore, a user (prospective tourist) becomes involved in the advertising communication process as a party to its conversations and/or interactions, thereby enabling him to save his favorite information and retrieve it at any time. The Genç study (2018) showed that the impact of AR technology on tourist satisfaction is significant for the tourism sector. Specifically, as tourists may enjoy this new type of reality, their level of satisfaction is expected to increase in parallel with developments in AR technology which, since advertising is an effective form of promoting and publicizing tourism, is a prerequisite for further development of the tourism sector.
Using AR technology features in tourism advertising enhances ads with certain characteristics, such as user immersion, and reaches users in a way that other media cannot achieve (Leach 2013). Innovative marketers can now take advantage of AR to craft more tourism experiences and ads that enable consumers to view and interact with unique tourism sites and monuments. Although it can play an important role in integrated marketing programs, little is known about

this practice and the effectiveness of AR programs implemented in the market (Scholz and Smith 2015).

Vlahakis et al. (2002) investigated the effectiveness of AR systems for restoring the historical lives of people and events by creating monuments, temples and old buildings as virtual 3D objects integrated with the real world of tourists. They showed that the first cultural heritage site that benefited from the virtual reconstruction of a temple was Olympia in Greece where researchers developed the AR Archeo Guide system.

AR has received a great deal of interest in the various fields of tourism marketing, especially museums, because it is related to the history, knowledge, learning and exchange of experiences. It is clear that it is being applied in museums around the world and places marked as having adequate technological fundamentals. It plays a crucial role in knowledge sharing and provides spaces for generating visitor experiences. Its application also supports the marketing and branding of a specific destination either by a verbal recommendation or repeat visit (Hassan and Ramkissoon 2016).

In general, AR technology is a visualization method that forces computer-generated data, such as text, video, graphics, GPS data and other multimedia formats, to integrate with real-world features, such as those captured by a mobile phone camera, computer or other technological device (Kounavis et al. 2012). Therefore, its use has become more common, in both the scientific world and for the general use of consumers (Fritz et al. 2005). It refers to overlaying virtual 3D objects on those in the natural physical environment to enable writings, images, videos, etc. to be viewed in the open air by users via digital displays, smartphones and other means (Feng & Mueller 2018).

Carmigniani and Furht (2011) defined AR as augmenting the direct and indirect real times of the real physical world by adding a layer of virtual information to it so that a user experiences these mixed facts through digital screens such as smartphones and projections. Feng & Mueller (2018) defined it as the co-existence of virtual and physical realities in the same physical environment as well as the interactive nature of information in the physical reality.

According to Höllerer and Feiner (2004), a user interface should not only be able to locate a user but also provide basic information on his area of interest. This idea has led to scientists attempting to invent novel tourism applications on mobile devices (Cheverst et al. 2000). These apps are being continuously modified in order to improve efficiency and become fully functional, for example, the city of Vienna has provided a tourist guide application capable of enabling a user to navigate to certain locations. It can also provide information of nearby locations which can be selected (Cheverst et al. 2000).

While social networks are constantly being supported, it is easy for multiple users to access and share information. The tourism industry requires continuous investment in new advertising technologies to facilitate the promotion and marketing of archaeological sites and objects, preferably via mobile devices, in order to continue to attract users. This poses a major challenge for many destinations around the world that lack adequate funding opportunities (Fritz et al. 2005).

Buhalis and Law (2008) noted that AR has become of interest to archaeological organizations that want to create interactions between visitor experiences and technological applications that are very influential regarding tourist destinations. Jung et al. (2015) stated that cutting-edge AR technology is particularly valuable for the tourism industry as a user management tool.

Technological applications in museums can help to develop entire sites from several perspectives, including branding and marketing (e.g: Mitropoulos and Tatum 2008; Yu and Tao 2009). However, due to their novelty, the number of associated academic research works is very limited.

However, there are a few studies that examined the impact of AR campaigns and consumer attitudes towards them, finding that the best ones are those offering more fun, entertainment, comfort and savings in time than traditional advertising in terms of novelty, innovation and impact (Dacko 2017). They add new interactive and subjective values to a user and provide him with a relatively high level of satisfaction. AR represents a change in user behavior that, in turn, provides businesses high ratings for user satisfaction (Feng & Mueller 2018).

AR has quickly emerged as a potentially powerful tool for digital advertisers as it allows a user to point his smartphone, tablet or computer camera to a product, ad or image, display a digital interaction in his physical surroundings and zoom in or out, rotate or view an item from different angles. However, a product's dimensions may change and limit its impact on a tourist (Hopp and Gangadharatla 2016). According to the Van Schaik study (2018), the economic impacts of AR and VR are expected to reach $US 29.5 billion by 2020 (Arpost, 2017), AR software $US 35.22 billion (Arpost 2017) and the number of AR users on smartphones 2 billion; for example, Huang and liao (2015) identified an AR acceptance model as being a "sense of real existence", with its expected benefit of ease of use and service excellence of beauty and clarity leading to a greater uptake of AR.

Virtual reality (VR) is different from AR as it completely immerses a user in a virtual environment where the computer shows partial information to augment the user's sensory environment while, in reality, the physical environment is completely replaced by another VR. (Baek, yoo and yoon 2016). Although it is the latest of this type of technology, despite its effectiveness, it does not allow a user to see the real environment with digital virtual elements (Fritz et al. 2005).

The results of the Singh and Pandey (2014) study indicated that users spend a lot of time online, on computers or mobile phones, which supports our view of the importance of promoting and marketing tourism via smartphones. Users no longer prefer negative monologues by marketers but want to be part of an interactive process with more engaging advertising that provides them with all the information they need to make a purchasing decision. The smartphone has become an integral part of a user's personality, with all its elements potentially leading to the success of AR technology.

According to the study by Kounavis et al. (2012), AR technology is used in the tourism sector to improve tourists' experiences. Furthermore, (e.g: Yovcheva et al. 2014; Tom Dieck and Jung 2015) its potential to create an interactive and enjoyable tourism experience has been clearly demonstrated.

Although studies of the impact of AR ads on a user's engagement with them are scarce, based on those mentioned above, we expect that, by applying the interactive principle of the 3D embodiment of the tourism effect, a user's sense of realism will be stimulated when experiencing AR which, in turn, will attract him. This will increase his interest, enhance his assessments and impact his tourism behavior (Baek, yoo & yoon 2016).

Feng and Mueller (2018) pointed to the multiplicity of advantages that enhance the position of AR technology and increase its positive benefits for augmented advertising experiences as follows.

- It's entertaining (e.g., during the 2014 World Cup, McDonald's allowed users to download an AR app that included their real surroundings to play football).
- It's useful technology (e.g., Timberland augmented its customers' experiences by allowing them to try on clothes without having to enter changing rooms, as did Wal-Mart. Both implemented AR technology which enabled users to navigate in-store and shop faster).
- From a marketer's point of view, it is a novelty, with one of its qualities that it has an impact on a user's interaction with a product, brand or advertising message as he prefers to connect with AR passive ads rather than the negative forms of traditional ads that do not generate active interactions of the audience.
- It provides information of user data that allows marketers to track and measure a user's response to a particular TV ad or billboard display at any time which was previously impossible. However, Hopp and Gang (2016) noted that, despite what is gained from these new AR practices that are very interesting, an individual's curiosity fades with repetitions or interactions over long periods. Also, some unconventional consumers may find it difficult to use such an application and an augmented experience does not allow those who prefer real marketing experiences to evaluate a product based on what it looks like or its level of quality (Bulearca and Tamarijan 2010).

Types of AR technology

After analyzing more than 50 AR materials, Scholz and Smith (2016) published an article that identified the following typical marketing models for which AR applications would be appropriate.

- Active print packaging: this requires a relatively high interactive experience because it is necessary to download a specific application on a smart device, either smartphone or tablet. Then, a user can scan the augmented advertising experience through the device's camera, with the print ads either outdoor or magazine ones or showing the packaging of products (Feng and Mueller 2018). One of the most well-known examples of this type is the Volkswagen Juiced Up billboard in which a beetle flew outdoors. Also, IKEA catalogs allowed a user to install and update virtual furniture in his apartment or physical environment (Scholz and Smith 2015).
- Bogus window: this requires an allocated digital screen to run an augmented advertising experience, with its size varying according to the location and nature of the object. It does not require a high level of self-interaction by the user as the object is displayed directly in front of him as soon as he stands in the relevant spatial environment (Feng and Mueller 2018), for example, a VISA ad inside a mall enabled large animals to appear on a screen where users could play with them in order to promote the slogan "try something new with VISA". A Walking Dead hidden tram screen at a station was used to augment an actual street scene while waiting for a zombie to approach pedestrians. A Mercedes outdoor ad (Societe) contained a glass leaflet for applying the AR experience to a digital screen (Scholz and Smith 2015).
- Geo-layer: this is a system often used when it is difficult to locate a company or shop for a commercial purpose or service which depends largely on a relatively high level of self-interaction by a user. To integrate the user's physical reality with digital elements linked to GPS

locations, it requires downloading a specific smartphone application and spatial survey through a company such as Tokyo Sunshine Aquonum. It provides a consumer with a virtual route to the required company's place on his smartphone and has led to a 152% increase in users (e.g: Holly 2014; Feng and Mueller 2018).

- Magic mirror: this technology, which is often implemented using digital women, does not require a relatively high level of self-interaction because a user does not need to download a special application. However, when he stands in a specific place in front of a digital woman, he can interact with digital elements and see both of them in the environment mixed with default elements. This was used by Lynx Axe in the USA in their advertising campaigns whereby the company placed banners at Victoria railway station in London asking travelers to look at a giant video screen on which they could see images of themselves interacting with virtual angels (Russell 2012). It can also be used as a virtual fitting room which includes 3D images that give consumers a chance to see how they look in a garment, shoe, etc. This requires a user to stand upright in the corner with a computer camera to enable him to manipulate and/or interact with the application and try on different outfits (Baek, yoo and yoon 2016).
- Projection mapping: in this, the level of self-interaction is relatively low, with buildings, cars and the external environment in general used to automatically display animated videos in front of pedestrians. It requires little interaction with pedestrians and often provides a type of sound suitable for mobile viewing, such as in the promotion of a new Nissan Annent Sedan and Hyundai presenting a huge 3D rendering on a built-in Jabei (Feng and Mueller 2018).

In terms of tourism and tourist destinations, in 2010, Tuscany + emerged as the first AR app which was developed specifically for the Tuscany region of Italy by Fondazione Sistema Toscana and serves as a digital tour guide. It offers tourist information, including the city's accommodation, dining venues, nightlife and sightseeing spots in both the Italian and English languages at http://www.turismo.intoscana.it.

Another example is an application created by the Itacitus Consortium with representatives of six different organizations in four European countries to explore ways of using parametric technology to encourage cultural tourism with AR to improve the appreciation of cultural heritage sites by adding 3D elements, such as missing paintings, background information and dust pictures. This app can also make recommendations regarding popular places to visit as soon as possible (Pence 2011).

The Basel AR app for another city Basel's AR app, which acts as its own tour guide, can be accessed through the Layar AR browser and was made available in English, German, French and Spanish in 2011. In general, its content is extracted from the dedicated database of Basel, with users able to retrieve valuable information of the city and its environs, especially its sights, museums, restaurants and hotels (http://www.perey.com/AugmentedRealityForBasel/). Also, the AR technology used for the StreetMuseum application containing tourism activities was developed by Thumbspark Limited in 2010 specially to meet the needs of the London Museum. It provides users with the opportunity to visualize the City of London by aiming their mobile cameras at current street views and obtaining historical images of them (http://www.museumoflondon.org.uk).

Therefore, we find that there have been previous attempts to integrate the services of AR technology to promote the tourism sector. However, according to Garcia-Crespo et al. (2009), the tourism advertising industry now needs integrated value-added services based on

technology that provide interaction and entertainment through highly dynamic structures. Martínez-Graña et al. (2013) stated that AR applications are particularly valuable for the tourism advertising industry because they improve tourists' social awareness of their surrounding environment and unknown territory. Given the scarcity of studies on the impact of AR ads on a user's engagement with advertising, this research fills some of these gaps.

The Smart AR (MAR) concept developed in the mid-1990s includes an AR application in smartphone settings rather than a fully virtualized environment. It begins with the same reality and then augments it with digital information overlapping the real world (Olsson et al. 2013). Marketers and advertisers then decided to take advantage of its experimental features and devised new augmented interactive methods based on smartphones; for example, Google Glass's 'wearable AR head-mounted display' (HMD) improves the visual perceptions of his world by a user by adding layers of virtual information. The same principles apply to phonetic information that complements a phonological perception of the world (Chi H-L et al. 2013). The emergence of MAR gave organizations and destinations the opportunity to provide a large amount of tourist information in a new and easy form, thereby promoting travel destinations and reaching more customers by interactively enhancing their travel experiences (e.g: Kurkovsky et al. 2012; Yovcheva Z et al. 2013; Van Doorn and Poelman 2010).

User Engagement

The 2010 Journal of Service Research prepared a special issue entitled 'User Engagement' to highlight the importance of this term in marketing research. The authors pointed out that users' engagements go beyond the limit of transactions and can be defined as their behavioral manifestations focused on an advertising service resulting from logical incentives (e.g: MSI 2010; Van Doorn et al. 2010; Roderick J. Brodie et al. 2011).

User engagement has been defined by many authors, with Brodie et al. (2011) referring to it as a catalytic state resulting from sharing, interacting and creating user experiences using a pivotal product. Hollebeek (2011) defined it as the level of individual motivation for a user regarding advertising in the context of his personal state of mind obtained from a set of specific activities, namely cognitive, emotional and behavioural, in advertising interactions. The Institute for Marketing Science (MSI) (2010) stressed the need for more research-based knowledge and identified user engagement studies as one of the priorities in coming years. It also recommended looking at the ways customers relate to their consumption experiences defining customer engagement (UE) as "a behavioral manifestation of customers towards a brand or post-purchase company which results from motivational programs, including oral activity, recommendations, customer interactions with customers, blogs, writing reviews and other activities".

Patterson, Yu and de Ruyter (2006) (e.g: Vivek, Beatty and Morgan 2010; Hollebeek 2011; Mollen and Wilson 2010) defined user engagement more comprehensively to recognize the existence of cognitive, emotional and behavioral dimensions based on the literature available in related fields such as social psychology. Based on research on organizational behaviour, Patterson, Yu and de Ruyter (2006) proposed the following four specific components of user engagement.

- Absorption: is the level of user focus on the element of focal correlation which reflects its cognitive dimension.
- Dedication: is a user's sense of belonging to an organization or advertiser that corresponds to the cognitive dimension of engagement.

- Vigor activity: is the energy level of a user and his mental flexibility for interacting with the object of focal correlation (the declared organization).
- Interaction: is the two-way interaction between a target and object of a correlation which reflects the last two elements of the behavioral dimension of correlation (Roderick et al. 2011).

Various sub-forms of engagement suggested for understanding a user-advertiser experience cover all the interactions with stimuli (i.e., product and/or service) during the advertising process, including pre-purchase and post-purchase ones (Lemon and Verhoef 2016). A user who believes that his unforgettable consumption experience will provide him with a greater chance of achieving complete satisfaction tends to post positive words and is more likely to pay a higher price (e.g: Berry, Carbone & Haeckel 2002; Mascarenhas, Kesavan and Bernacchi 2006).

Some research has proposed stimulating user engagement by exploiting the interactions of the online community and social networking sites (e.g: Mun˜iz and Schau, 201; Kietzmann et al. 2011) based on the significance of smartphone advertising and its link to Internet services that are important in the daily routines of users (Rohm et al., 2012). Calder and Malthouse (2008) referred to the term 'media correlation' by focusing on empirical aspects of user engagement as the sum of the motivational experiences users have with a broker's product (Roderick J. Brodie et al. 2011).

Due to user relations being one of the key issues in marketing, many authors have emphasized their influence in advertising and promotion. (Fernandes and Esteves 2016). Relying on the sustainable competitive advantages of an advertiser in order to maintain and nurture its customer base in the long term has become a priority for organizations and companies (e.g: Anderson, Fornell and Maz-vancheryl 2004; Gruca and Rego, 2005; Van Doorn et al., 2010; Fernandes and Esteves 2016).

Although the existing literature provides a sufficient understanding of the pre-purchase experiences described by users afterwards with a focus on recurring transactions, these interactions (Venkatesan 2017) are of paramount importance because they indicate a user's engagement and development of transactional behaviors or provide information for implementing better Romero products and/or services in future (e.g: Romero 2017; van Doorn et al. 2010).

Higgins and Scholer's (2009) view on theories of organizational attachment referred to the state of a busy, engaged and time-consuming user which, in turn, generates a level of attraction or aversion to the focal element of that association (Roderick J. Brodie et al. 2011). Mollen and Wilson (2010) presented a brand's online engagement as including the dimensions of continuous cognitive processing, effective value (benefit and importance) and empirical value (emotional congruence). Accordingly, they assumed that user engagement goes beyond the exercise of cognition and requires both experimental and effective values to be satisfied (Vargo 2009).

Since research indicates that user engagement increases the sales, productivity and appeal of an advertising message (Barth 2007), if an advertiser has a high percentage of associated users, it is clear that the ad will be more successful (Roberts and Alpert 2010). The world's leading organizations and companies recognize that engaging their customers and users is the key driver of their success. Gallup's research in various fields shows that, as fully engaged customers buy

more and stay with a particular product longer, are more profitable than ordinary ones (Enginkaya and Esen 2014).

Van Doorn et al. (2010), Mollen and Wilson (2010) and Higgins and Scholer (2009) pointed out that engagement is a permanent and positive motivational state that requires fulfilment and is characterized by vitality and dedication. Correlation is a measure of the strength of the relationships of users with an advertiser, whether a company or an organization, based on the extent of the formation of emotional and rational links with that corporate entity (Bowden, 2009).

Although the term user engagement goes beyond participation, satisfaction, trust, reputation and loyalty, the meanings of these concepts must be clarified to arrive at that of engagement (Enginkaya and Esen 2014).

- Involvement: this is the continued sale of preferred goods and services to regular customers (Oliver, 1999).
- Satisfaction: this an assessment of the differences between the performance of a product or service and its criteria (Westbrook and Oliver 1991). It is a brief psychological state or judgment of a personal nature based on a user's experience of the product or service (Helgesen 2007).
- Trust: this is the confidence of an individual in the intentions and motives of an institutional entity and the extent to which it is honest (Lewicki and Mcallister 1998) that is essential for building and maintaining long-term relationships.
- Reputation: this is the result of repeated interactions and cumulative experiences (e.g: Castro, López and Sáez 2006; Dortok, 2006). A corporation's reputation is an emotional capital that reflects the perceptions of various stakeholders about its past and potential future actions as well as its tangible and intangible assets (e.g: Kotha, Rajagopal and Rindova, 2001; Walsh, Beatty, Shiu 2009; Firestein, 2006).
- Loyalty: this revolves around the relationship between a company and its users whereby a user with loyalty continues to support the company and buys more goods and services (e.g: Lawson Body and Moez Limayem, 2004; Donio, Massari and Passiante 2006; Engin kaya and Esen 2014).

Organizations have launched new initiatives to encourage user engagement and measure its levels in response to the increasing consumer resistance to traditional marketing programs (e.g: Bagozzi and Dholakia 2006; Fernandes and Esteves 2016). Therefore, user engagement can be considered a multi-dimensional concept that includes cognitive, emotional and behavioral dimensions (Fernandes and Esteves 2016).

Bowden (2009) described user engagement as a 'psychological process' that drives user loyalty. It is primarily concerned with studying the formation and development of user relationships and is particularly characterized by different levels that may be individual- or context-specific (e.g: Bowden, 2009; Sprott et al., 2009).

Vivek (2009) conducted preliminary research to develop a 3D measurement scale for CE that included enthusiasm (emotional cognitive), conscious participation (behavioral) and social interaction, with CE considered a reflective construction with different dimensional expressions/dimensions in different contexts. The latter focuses primarily on non-transactional customer behaviors that may affect a company. As a training facility. CE is presented through codes, recommendations, loyalty programs, helping other customers, writing reviews, interactincustomer interactions, blogs, and participating in actions (e.g: Jaakkola and Alexander

2014; Romero and Okazaki 2015; Van Doorn et al., 2010; Verhoef et al., 2010; Wei, Miao and Huang, 2013). Empirical studies have been conducted to understand consumer engagement (CE) behaviors with brands, especially through the Internet community.

Novelty

Many studies have confirmed that using novelty stimuli to induce the processing of active and effective information results in better remembering and recognition than using non-novel stimuli. (Edwards and Gangadharbatla 2001). Novelty is reflected in individual perceptions that these stimuli are new, unfamiliar or completely different from the others previously encountered (Tokunaga 2013).

Forster, Lieberman and Shapira (2011) clearly identified new incentives as objects or scenarios for which residents lack 'experience and familiarity' that can be derived from a number of factors related to stimulation. New stimuli are thought to provoke intense deliberations (Ajzen 2002) in assessments of modernity and, indeed, a large body of academic research seems to support a positive link between perceived novelty and exploratory engagement (e.g: Fahy, Riches, and Brown 1993; Li, Miller and Desimone 1993; Hopp and Gangadharbatla 2016).

Attracting attention is one of the ways in which novelty helps the processing of information as it is believed to focus from the inside out (Edwards and Gangadharbatla 2001). As, according to Carver and Scheier (1981), novelty distracts an individual away from his internal state which leads to him paying greater attention to the environment, it is the first necessary step for processing information. Therefore, the appearances of new online incentives arouse a user's interest in searching for more information and, perhaps, provide greater relevance to the product or service for motivational purchasing. Depending on the capability of novelty to feed the need for change, it can reduce boredom (Edwards and Gangadharbatla 2001).

Recognition of novelty is at its strongest during the early stages of exposure to a new catalyst and tends towards a linear decomposition with repeated interactions (e.g: Berlyne 1970; Tokunaga 2013). Usually, companies seek to establish a link between their users and advertising through novelty without expecting an implementation to be relevant by providing useful information (Hopp and Gangadharbatla 2016).

The novelty and innovation of advertising are integral parts of its effectiveness and, given the current increase in advertising chaos, the designs of ads are becoming more important for generating interest and awareness. At the same time, creative ads must also deliver a clear message that recalls the business entity or brand by adequately linking it to the advertised product. In keeping with this reality, Smith and Yang (2004) identified advertising creativity as "the extent to which advertising differs from expectations while remaining useful for the current task" (Sheinin, Varki and Ashley 2011).

The Hopp & Gangadharbatla (2016) study of novelty noted that it reflects the meaning of something that did not previously exist and its ultimate sources are the innovative activities of the human mind together with research on human creativity as well as cognitive and technological sciences.

The 'mission at hand' for creative advertising is to build awareness of the advertised entity (as measured by brand recall), the organization's strongly stated beliefs and its positive attitude. Consequently, an advertiser (Keller 1993) generally seeks to achieve this by breaking the limits of expectations, applying the principle of novelty and being relevant by providing useful

information. Representations of all the novelty and advertising creativity in modern implementations and the usefulness of messages are greatly supported in the advertising literature (e.g: Ang and Low 2000; Smith and Yang 2004; Smith, Chen, and Yang 2008; Smith et al. 2007).

We find that the novelty offered by AR technology for advertising contains at least three features. The first is the actual interactions between the augmented elements and user, those of the user in physical spaces and those of the company or advertiser with the user. They force the virtual digital environment on the physical one in real time to decrease the sense of separation between users and advertisers. According to the study by Belch and Belch (2009), novelty refers to the extent of the influence of advertising within the limits of user expectations and is linked to the words 'unique', 'different' and/or 'always new'.

Study

In this study, we tested these hypotheses by scanning ads for 3D models of two Egyptian monuments using AR technology through an application on a smartphone specifically designed by the Auther to perform this experiment. We compared the impact with those of traditional tourism advertising which displayed the same two previous archaeological models in ads that depicted the sanctity of Egyptian tourism sites.

It was anticipated that integrating digital AR technology in smartphones for tourism advertising would lead to higher rates of user engagement (H1) and the impact of the resultant augmented advertising experience would enhance novelty (H2).

Design, participants and procedure

This study conducted two experiments using two ads implemented with AR technology and two traditional ones. The first experiment involved an augmented 3D model of King Tutankhamun's throne and the second a 3D model of his shroud. These models were processed visually with their material compositions (materials) very close to their real ones to largely reflect the realism of archaeological models (Figure 1).

A special application, 'Egypt AR Tour', designed for the experiments could be downloaded on a play store to allow any user to run it easily for free by focusing a phone's camera on a poster ad which automatically showed the default 3D model in the ad's space in the user's physical real world for him to interact with that model whenever he wanted. (See Appendix 2 for screenshots of the conditions for the AR experiments).

Figure (1) Augmented realty condition (First ad, Second Ad and the app Icon design)

It also provided the application with adequate information about each model through a special information icon and access to the Internet to search for more information. A user could save images of the model taken on his smartphone at any angle, zoom in and out as well as roll and zoom in and zoom out which enabled free interactions with both models.

When conducting research in business, a sample size of 30 to 500 is considered sufficient (Wright & Crimp 1995). The sample size determined for this study was 174 participants (Baek, Yoo and Yoon 2016), 51.14% men (89) and 48.85% women (85) with an average age of 20. Responses were collected from online consumers in different countries using the Facebook website.

There was a balance of participation via the Internet. Participants were provided with reinforced declarations in the initial cases of King Tutankhamun's throne and shroud, with a symbol reflecting the meaning of the availability of the reaction (Figure 1) and augmented trial instructions. Each ad was provided with a sentence describing the augmented experience and participants were instructed on the type of application to download to implement the experiment through the poster. The 'play store' icon for loading the app into the ad was then subjected to the experiment by opening the app and scanning the ad using a smartphone camera whereby the 3D archaeological model automatically appeared and the experiment began by allowing free interactions with the stereo.

Also, the two traditional ads were presented to the participants with a link to the questionnaire using the same archaeological elements (the throne and shroud of King Tutankhamun) as visual catalysts and the same background designs and colors to reduce any confusing effect of the aesthetics (Figure 2). The average time spent by the participants was 13 minutes and 12 seconds.

Figure (2)Traditional condition (First ad and Second Ad)

The participants completed the questionnaires attached to the two experiments for the declarations (Appendix 1) which included several procedures and elements for determining their attitudes towards each announcement. They were then asked to send the questionnaires and were thanked for their time and effort.

To ensure an objective score, the researcher applied two ads in each experiment and then calculated their average results as the basic score of the whole experiment.

Measurements

The UE was measured using 10 items from previous research (Hollebeek et al. 2014) with a 5-point Likert scale of 1 = strongly disagree, 2 = disagree, 3 = neutral, $ = agree and 5 = strongly agree. There were responses such as: ‘Using (these ads) gets me to think about (traveling)’; ‘I think about it (the smartphone app Egypt AR Tour) a lot when I’m using it’; ‘Using (this ad) stimulates my interest to learn more about Egyption heritage’; ‘I felt very positive when I used this ad’; ‘Using this ad makes me happy’; ‘I feel good when I use this ad’; ‘I am proud to use this ad’; ‘I spend a lot of time using this ad compared with other traditional ads’; ‘Whenever I use ads, I usually use this type of ad’; and ‘This interactive ad is one I usually use when I use ads’. Novelty was measured using 5 items from previous research (Altsech 1996; Koslow, Sasser and Riordan 2003; Sheinin, Varki, and Ashley 2011), all of which were measured using a 5-point Likert scale of 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. There were responses such as: ‘This ad is original’; ‘This ad is different from my expectations of a print ad’, ‘This ad is memorable’, ‘This ad is visually interesting’; ‘This ad is interesting’; and ‘This ad is different. Finally, participants answered personal demographic questions (e.g., age, gender and ethnicity).

Results

To determine whether AR ads led to stronger user engagement than traditional ones (H1), a T-test was conducted for independent samples with Eta Square as an effective size. There was a statistically significant difference between the mean scores of the first experimental group (AR) and second (traditional) for consumer engagement at an 0.05 level of confidence in favor of the former, as shown in Table 1, which supported H1.

Table 1. Statistical measurement of User Engagement

The table shows that there is significant difference between the mean scores of the first experimental group and the second group in fovor of the augmented group

Variable	Group	No.	Mean	**Std deviation**	df	T	Sig.	Size effect (η2)
User Engagement	First exp. (AR)	174	42.0805	**11.19942**	346	-6.226	.000	**.10**
	Second exp. (T)	174	33.2069	**15.10092**				

Note. The value of table (t) at level of significance (.05) and degree of freedom (346)=1.960

Note. The value of table (t) at level of significance (.01) and degree of freedom (346)=2.576

Also, a T-test of independent samples with Eta Square as an effective size was conducted to determine whether the AR ads enhanced the novelty principle more than the traditional ones (H2). There was a statistically significant difference between the mean scores of the first (AR) and second (traditional) experimental groups for novelty at a 0.05 level of confidence in favor of the former, as shown in Table 2, which supported H2.

Table 2. Statistical measurement of novelty

The table shows that there is significant difference between the mean scores of the first experimental group and the second group in fovor of the augmented group

Variable	Group	No.	Mean	Std deviation	df	T	Sig.	Size effect **η2**
Novelty	First exp. (AR)	174	27.2586	4.75490	346	-19.931	.000	**.53**
	Second exp. (T)	174	17.9713	3.89520				

Note. The value of table (t) at level of significance (.05) and degree of freedom (346)=1.960

Note. The value of table (t) at level of significance (.01) and degree of freedom (346)=2.576

Discussion

Our study supports the assumption that using AR technology via smartphones for advertising leads to high rates of user engagement (H1) and enhances the principle of novelty compared with that of traditional tourism ads (H2). Using a smartphone app designed specifically for the experiments, we found that, when participants reacted positively to its self-loading and running, they had a higher correlation with it than viewing the same ad in the traditional way.

The data analyses indicated that the calculated value of T was greater than its tabular one. With reference to the average results, the difference in favor of the augmented experience ones was consistent with those of previous studies (e.g: Baek, yoo and yoon 2016; Fritz et al. 2005; Kounavis et al. 2012; Feng and Mueller 2018).

Our findings have several theoretical implications. Firstly, they add to a growing body of literature that explains how users interact differently in AR's interactive and subjective environments, as confirmed by a user's attitude towards self-interaction with advertising in an ARA environment compared with that for a traditional advertising experience.

Our results provide important practical implications for digital marketers in the advertising world. The AR technology in an ad allows a user to interact directly with models of monuments from a distance and provides unique interactions that cannot be experienced in the real world while preserving the importance and holiness of the monuments.

Therefore, marketers no longer have to rely solely on traditional advertising techniques but can use AR technology to facilitate the display of tourist sites in an interactive and realistic 3D model which allows implicit and subconscious interactions. According to the results of this study, users showed a preference for ads with positive interactive monologues which generated correlative relationships between them and advertisers. Looking after a user and giving him the right to participate in the advertising process increases his sense of appreciation of the advertiser. Also, this technology provides a user with all the necessary information to make a decision and establishes a high level of competitiveness among entities.

Marketers should move towards using AR technology in advertising for its intrinsically better performance than what is customarily obtained through a smartphone which has become a routine part of a user's everyday life. Integrating interactive AR technology into smartphone advertising offers significant advantages that increase user engagement as an ad and its message appear more innovative, making a user an increasingly active and responsive member of the message.

Another major contribution of this study is determining that the impact of AR technology in advertising enhances the novelty principle, with the results of the augmented trial indicating a positive relationship between an ARA assessment and high user engagement.

This study adds to a range of others in the literature (e.g: Yang and Smith 2009; Sheinin, Varki, and Ashley 2011; Hopp and Gangadharbatla 2016) that investigated the principle of novelty created by modern technology. It extends previous results and provides a new perspective on the benefits and effects of AR technology that reinforces the novelty principle and its use in advertising.

It offers an alternative to a realistic and effective model for tourism advertising by demonstrating that AR technology in tourism ads presented in a holistic and realistic form is more effective than traditional advertising when consumers control the advertising process. It allows self-interactions with experiences so that a user becomes one of the original and

interactive parties in the augmented interactive environment which reduces boredom during an augmented experience and becomes a new catalyst capable of capturing the user.
According to the level of perception of novelty during new exposure to an active and creative stimulus based on studies of the principle of novelty (e.g: Berlyne 1970; Tokunaga 2013; Hopp & Gangadharbatla 2016; Belch and Belch 2004), using this technology in tourism advertising has a significant effect on promoting the authenticity and holiness of monuments. As it is impossible to transport actual Egyptian monuments, exporting identical digital copies of them in the form of a visual ad enables a high rate of self-interaction that captures the attention of a user and influences him to confirm traditional expectations.

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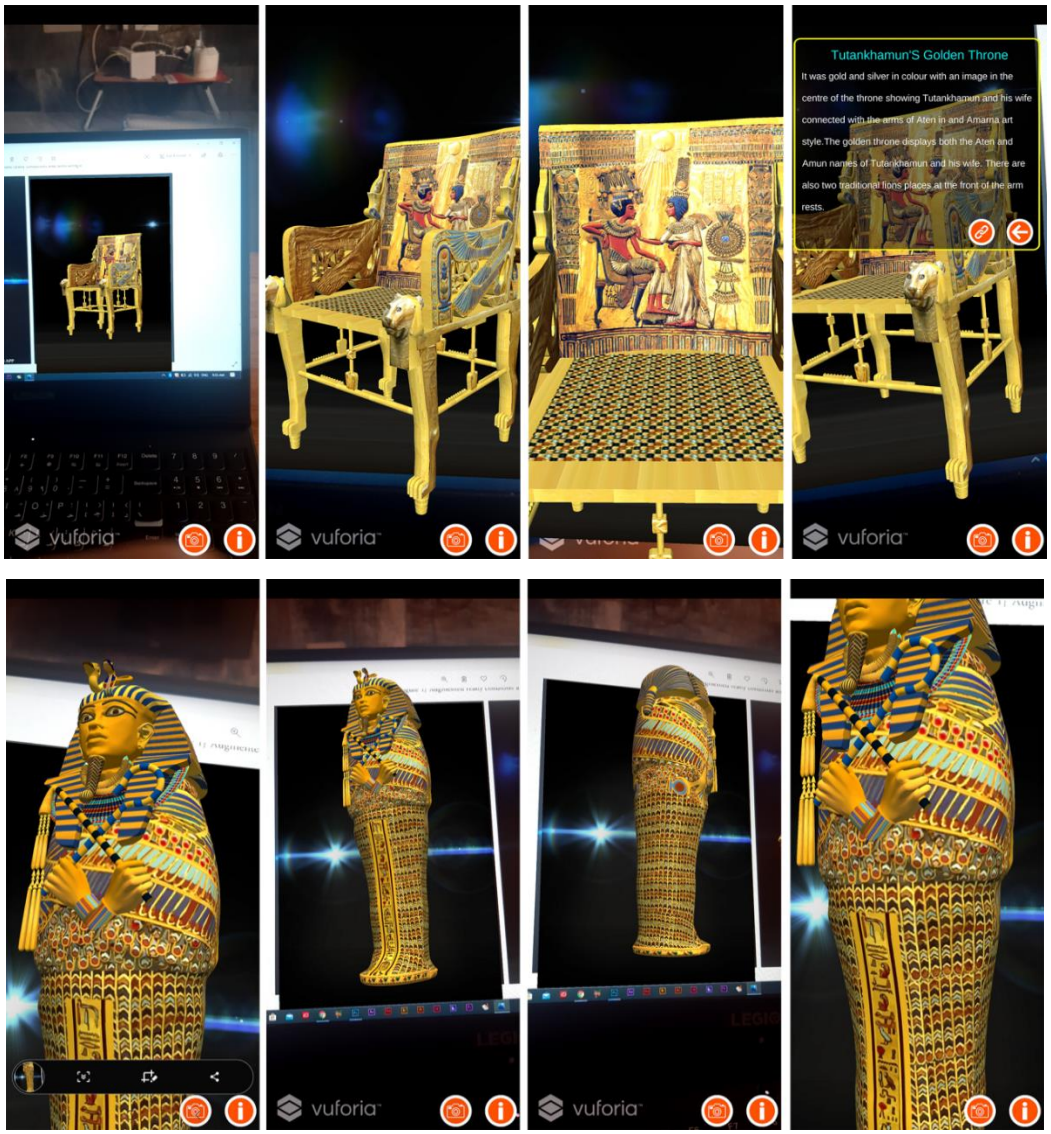
Appendix 1
The questionnaires attached to the two experiments for the declarations

Construct		Items
Consumer Engagement	Cognitve Processing	COG.PROC1: Using (this ads) gets me to think about (traveling)
		COG.PROC2: I think about (Smartphone app(Egypt AR Tour)) a lot when I'am using it.
		COG.PROC3: Using (this ad) stimulates my interest to learn more about (Egyption Heritage).
	Affection	AFFEC1: I fell very positive when I use (this ad).
		AFFEC2: Using (this ad) makes me happy.
		AFFEC3: I feel good when I use (this ad).
		AFFEC4: Iam proud to use (this ad)
	Activition	ACTIVE 1: I spend a lot of time using (this ad) compared to other (traditional ads).
		ACTIVE 2: Whenever I will using (Torism ads) I usually use (this type of ads).
		ACTIVE 3: (this interactive ads) is one I usually use when I use (ads).
Novelty		This ad is original.
		This ad is different from my expections of a print advertisement
		This ad is memorable
		This ad is visually interesting
		This ad is interesting
		This ad is different

Appendix 2

Screen shots of the conditions for the AR experiments



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