ABOUT THIS REPORT

With the release of powerful smartphone devices, and more recently Google’s project Glass, Augmented Reality (AR) quickly became the new buzz word. The technology allows combining seamlessly physical world and virtual information, but is still widely under-utilised in the field of Tourism. This report presents 10 highly innovative AR experiences that showcase the potential of the technology to revolutionise the way we experience new destinations and services within the industry.
1. **AN ENHANCED BOOKING EXPERIENCE**

After years of incubation, AR is already revolutionising the publishing industry today. Readers of the Enquire magazine, Popular Science, or Time can view additional multimedia content by pointing their smartphone towards specific pages.

This new breed of next-generation advertising could be applied as well to tourism catalogues, brochures, pamphlets, flyers and any other type of paper-based promotion materials. Hotels, casinos, theme parks but also special events or virtual roller-coaster trips could come to life to provide a better sense and impression of what the customer is buying. In fact, AR systems can exert a tremendous persuasive power and provide a lucrative opportunity to market services successfully – a feature which is still under utilised in the tourism and hospitality industry.

The most successful examples were developed by the Saint Petersburg Clearwater Bureau that used AR to offer a cutting-edge 3D experience to potential tourists. Named “Two Treasures 3D Tour” (above), the experience features a virtual tour guide which can be viewed on a desktop video camera at home. The experience features a virtual tour guide and provides a persuasive and interactive preview of the world famous beaches and museums.
2. MUSEUM INTERACTIVITY

AR provides a compelling educational environment. In fact, education is one of the areas which have benefited the most from AR since the technology provides a tangible interface which stimulates both mental and motor activities through an intuitive interaction with unfamiliar content. Educationally rich visits and visitor engagement is also one of the most important factors in the tourism industry and AR has huge potential to actively involve tourists in learning about and experiencing various museum settings and artefacts like never before.

Most recently, interactive digital storytelling techniques have been applied to museum settings to increase their educational potential. For example, the Digital Binocular Station (DBS), makes the static contents of a museum come to life, leading to an interactive, dynamic and interesting adventure which increases visitor retention time and return visits (shown below).

AR installations in museums can also simulate otherwise impossible experiences, as they are able to revive extinct animal species, worn-out frescos or fragmented cultural artefacts.

Above: A view from the Digital Binocular Station in the Canterbury Museum (NZ). The man shown in the picture is a virtual human who moves and interacts with the visitor, accompanied by a narrator voice and music.
3. AR BROWSERS IN THE DESTINATION

Amongst the many AR smartphone applications, AR browsers enjoy the biggest popularity. Many of them claim to have tourism-related functionalities. An AR browser suited for the needs of tourism enriches the real-world with interactive virtual information that allows visitors to unfamiliar locations to identify the most important and interesting points of interest and learn more about their surroundings.

Probably the most successful and interesting example is the stand-alone smartphone application Yelp (shown below), which added AR view to provide an augmented view to its users.

Above: The augmented view provided by the smartphone application Yelp.
4. RESPONSIVE EXPERIENCE THROUGH GAMING

AR games have been instrumental in promoting physical activity by leveraging real-world locations and objects as part of a more immersive gameplay. Considering the flexibility and high customisation of virtual information, different scenarios can also be applied to the tourism domain. As a matter of fact, location-based AR games have already proven motivating and engaging for tourists. One interesting example is TimeWarp.

This AR outdoor game, developed by researchers at the Applied Information Technology Institute (Sankt Augustine, Germany), allows tourists to walk around the city of Cologne in Germany, “jumping” through time portals and experiencing different historic and future events. Unlike the fictional gameplay offered by ARQuake and its successors, the main objective of TimeWarp was to encourage gamers to “interact with the city and to experience its temporal changes” (below). Evaluations showed that tourists describe the experience as fun, new and realistic.

Above: A screen capture from the interactive AR game TimeWarp
5. AUGMENTED SERVICES IN THE RESTAURANT

A similarly impressive example is the collaborative AR experience offered at the Inamo restaurant in London (UK) (below). The AR experience is based on projective AR technology.

Customers are able to interact with the tabletop and select their own table theme, order items from multimedia rich menu or see a live video-feed from the kitchen. Such augmented surfaces leverage the abundance of tables and walls, seen as canvases, in order to provide both a physical collaborative space and an interactive computer display of virtual information.

Above: The interactive AR experience at the Inamo restaurant in London
6. RE-LIVING HISTORIC LIFE AND EVENTS

Re-creation of ancient temples and historic buildings is a topic that lends itself naturally to AR with a number of developed prototypical and commercial systems. The first cultural heritage site that benefited from an augmented virtual reconstruction of an ancient temple was Olympia in Greece, where researchers developed the ArcheoGuide AR system. By using Layar, virtually any tourist can point their phone now towards the original location of the Berlin Wall (Figure 6) and see its virtual representation as a realistic 3D model.

Above: By using the Layar smartphone application, any tourist can view a virtual 3D model of the Berlin Wall at its original location in Berlin.
7. THE AUGMENTED REALITY HOTEL EXPERIENCE

Personally augmented experiences can expand the whole visit to a new destination. While a particularly suitable setting for enhanced AR experiences, hotels have been lagging behind in harnessing the true potential of the technology.

The best practice example was developed by Holiday Inn, announced the first Augmented Reality hotel. Guests can use their smartphone devices to see the virtual Olympic and Paralympic athletes at the reception, hall or in their own hotel room as if they were right there (below).

Above: The Holiday Inn AR experience
8. AUGMENTED TRANSPORTATION

AR systems are ideal tools that could guide tourists through unfamiliar environments. Navigation and wayfinding was one of the first application areas for AR. Augmented displays have the potential to reduce the mental effort required for both pedestrian and auto navigation.

AR can show virtual paths and directional arrows to facilitate both indoor and outdoor pedestrian and auto navigation. An excellent example is the smartphone application the Nearest Tube (below) which displays the route to underground stations from the current location of the user in London.

Above: The Nearest Tube augmented reality application allows visitors to easily find the nearest underground station in London.
9. AUGMENTED REALITY TRANSLATION

Navigation and exploration of unfamiliar environments could be significantly influenced by the lack of clear translation of foreign language signs and instructions. Apart from street signs, AR applications could provide real-time immediate translation of written text on dinner menus, train schedules and newspapers headlines from a foreign to the native for the user language.

Word Lens (below) and Intelligent Eye are two smartphone commercial applications which showcase this potential. Both overlay translated text over the original text the device is pointed to.

Above: The application Word Lens overlays translated phrases on top of their real-world counterpart.
10. PARTICIPATIVE DESTINATION MANAGEMENT

For centuries, planners and managers had to work with abstracted and generalised plans in order to select a balanced blend of structures, buildings and materials. Colour, textures and shapes all play a fundamental role in determining the aesthetic outlook of physical structures and AR could help managers and planners take the most optimal decisions through on-the-spot comparisons of alternative scenarios. The use of AR to superimpose virtual 3D models of planned innovations on top of the actual environment where they will be introduced can support effectively both individual and collective, as well as private and participatory, decision-making processes.

Recently, the Netherlands Architecture Institute announced the launch of the free Urban Augmented Reality (UAR) application, available in 8 cities in the Netherlands, that enables residents and tourists to experience the urban environment as “it once was”, “it might have been” and as it would be in “the future” (below). It allows users to add comments to a database, thereby effectively soliciting public opinion. This approach could prove useful in a number of tourism application areas, such as, for example, the construction of theme parks, resorts and attraction sites.

Above: Screen captures from the Urban Augmented Reality (UAR) application developed by the Netherlands Architecture Institute.
ABOUT DIMITRIOS BUHALIS

Professor Dimitrios Buhalis is a Strategic Management and Marketing expert with specialisation in Information Communication Technology applications in the Tourism, Travel, Hospitality and Leisure industries. He is currently Director of the eTourism Lab and Deputy Director of the International Centre for Tourism and Hospitality Research, at Bournemouth University in England. Dimitrios is also the President of the International Federation for Information Technologies in Travel and Tourism (IFITT).

ABOUT ZORNITZA YOVCHEVA

Zornitza is PhD Researcher at the John Kent Institute in Tourism at Bournemouth University, UK, researching Augmented Reality and smartphones.

Before joining BU Zornitza was part of a development team designing a web-based globe application for work with animated maps – work that will relate to her PhD studies. Her main research interests expand the domains of geovisualisation, web and mobile GIS, human-computer interaction, usability engineering and computer supported co-operative work. “I’m interested in the design and implementation of various map-based applications and keen to investigate how different factors (from user characteristic to level of interactivity, visual variable and number of users) affect their usefulness.

BOURNEMOUTH UNIVERSITY E-TOURISM LAB

This exciting new research Lab, led by Professor Dimitrios Buhalis and Bournemouth University, explores cutting edge information and communication technologies, alongside e-based strategic management and marketing for the tourism and hospitality industries.

The eTourism lab’s mission is to push back the barriers of knowledge on eTourism and through Information Communication Technologies (ICTs) empower policy making and strategic competitive advantage.

THE DIGITAL TOURISM THINK TANK REPORTS AND BEST PRACTICE

The Digital Tourism Think Tank is a new initiative which aims to provide a platform for knowledge exchange, best practice, events and workshops and benchmarking for the tourism industry.

The Think Tank is supported by Yahoo! and designed specifically to support the work of CEOs, Marketing Managers and e-Marketing Managers working in DMOs who are responsible for creating engaging and inspiring digital campaigns.