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| --- | --- | --- | --- |
| App | AR | VR | Description |
| *Aurasma* | X |  | App providing additional multimedia contents (video, link, website, 3D animation) when pointing an object (newspapers; picture; image, etc.) with a smartphone or a tablet |
| *Virtuoso*[[1]](#footnote-1) | X |  | Educational game which allows to put in a chronological order a collection of artworks |
| *Explore!* [[2]](#footnote-2) | X |  | Mobile augmented reality game supporting middle school students in visiting Italian archaeological sites.  |
| *Google Expeditions*[[3]](#footnote-3) |  | X | App providing 360° virtual visits to popular cultural attractions (e.g. Great Wall of China) through a smartphone and a Google Cardboard viewer |
| *Vatican app*[[4]](#footnote-4) |  | X | App providing 360° virtual tours to Vatican rooms in Rome and information about the site.  |
| CAVE[[5]](#footnote-5) |  | X | Acronyms for *Cave Automatic Virtual Environments,* app transforming surfaces (walls and floors) in projection screens enabling immersive experiences usually applied to cultural heritage education. Users need to wear 3D glasses |

Tab. 1 - Main apps and technologies applying AR and VR for cultural heritage (source: own elaboration).

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| Contents and nature of information provided |
| Flights information manager | Searching and tracking flights apps |
| Destination guides | Apps providing specific information about a place/destination |
| Online travel agency | Apps for searching and reserving various travel services |
| Facilitator | App providing quick facts (Wi-Fi spot, gas stations, local time, etc.) |
| Attractions guides | App providing travel tips  |
| Entertainment | App providing suggestions for fun |
| Language assistant | Apps providing practical information related to every-day life at a destination |
| Local transportation |
| Currency converter |
| Tips calculator |
| Augmented reality | App for viewing live situations in other places through webcams |
| Technical functions |
| Information | App providing information or information plus search functions |
| Two-way sharing capabilities | App providing information from users (e.g. about their location, preferences, etc.) to service providers, through the app itself, blogs and social media |
| Context awareness | Apps based on contextual sensors (e.g.: temporal and spatial location sensors) |
| Internet of things | Apps able to communicate with other people and everyday objects (e.g.: vehicles, parcels etc.); |
| Tagging | Apple able to leave messages on places and objects for future visitors |
| Level of customization |
| Personal preferences | Apps satisfying various personal preferences |
| Location sensitive | Apps providing interaction through location information systems |
| Security | Apps allowing the control of personal information |
| Control through the web | Apps providing frequent flier programs, e-books, itinerary compilation |
| Content addition | Apps that can change with contents added by users |
| Aesthetic changes | App that can change their appearance to fit users ‘preferences |
| The same for everyone | Apps that do not provide any interaction |

Tab.2. Travel app categories (source: own elaboration on Wang *et al*. 2011; Dickinson *et al.* 2014; Kennedy-Eden & Gretzel 2012).

Tab. 3. Smart Marca app profile (source: own elaboration)

1. Wagner *et al.* 2006. [↑](#footnote-ref-1)
2. Ardito *et al.* 2009. [↑](#footnote-ref-2)
3. < <https://edu.google.com/products/vr-ar/expeditions/?modal_active=none> > [↑](#footnote-ref-3)
4. <<http://www.vatican.va/content/vatican/it/apps.html>> [↑](#footnote-ref-4)
5. Christou 2010. [↑](#footnote-ref-5)