Adopting the Internet of Things (IoT) paradigm in Smart Museum Design

Museums are the heart of our cultural heritage, the heart of our civilization. In today's rapidly transforming world of predominant use of IoT and fluidity of information in big data, museums can no longer afford to stay static. Those museums who chose to remain plain reservoirs of artifacts will fail in addressing the needs of a constantly transforming society demanding interconnection, personalization, unobstructed access to all types of information. A lot of research is currently being conducted on how new digital technologies can improve the various ways artifacts are being displayed and conceived by visitors. Digital signage has brought artifacts closer to the users by allowing multiple reads, impressive detail and easy navigation. We see a significant advantage in exploiting new advanced digital media to serving the increasingly demanding needs of a transforming society, by shifting the focus from the artifacts to the users. Future museums should focus on creating personalized experiences, customized destinations and their visitors should be able to have multiple reads of their collections according to their background, wish and mood.

The *Digital Media Lab* from the Technical University of Crete in collaboration with *The Pole Society* and *Parthenios architects+ascociates* have been employing digital techniques to create smart, interactive spaces, who can understand and respond to the network of users inhabiting them. Instead of designing static rooms with static collections, we design experiences and personalized destinations with interacting users who share similar interest. Smart museums can become the platform for interaction for social groups who participate with their personal cultural trace and along with the artifact's physical, cultural, social and historical background contribute towards building a holistic approach in the artifact's perception. Visitors are transformed into users, museums into online platforms and artifacts into hubs of information. Artificial intelligence transforms spaces into responsive environments adjusting to the user's customized needs. Through proper combination of digital signage, location based services and user recognition, not only is the visitor's experience and

satisfaction increased but also the museum has a powerful new tool to manage visitors traffic and improve performance.

Moreover, we see a great potential in implementing targeted, real time, smart advertising techniques which could effectively generate additional revenue for the museums. An advanced, smart museum, can reduce or even eliminate entrance fee for its visitors and multiply its income through targeted advertising appropriately embedded in specific locations where users can interact with each other and with the building and the artifacts. In a recent case study in Bucharest our team installed 2 interior and 2 exterior large digital signage screens in an entrance lobby of an estimated 5,000 visitors daily, combining user recognition techniques with targeted advertising. The result was besides providing a different experience to the users (through gamification, digital art campaigns, improved navigation) an additional revenue per month. The above mentioned installation was implemented using simple face recognition cameras, Microsoft Kinekt, Indoor Atlas and the online platform provided by *The Pole Society*.

Our contemporary cities are rapidly transforming following the social transformations imposed by the exploded diffusion of IoT in our everyday life. Museums cannot remain still.