MUSEUMS AS COMMUNITIES DRIVING INNOVATION BY TECHNOLOGY

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Abstract. Museums drive innovation in services and processes through information technology within social and cultural ecosystems. Museums develop innovation using information technology to foster audience involvement and user participation, enabling museum professionals as user-centered mediators to build a bridge between information and knowledge. As innovation-led organizations contribute to knowledge and value creation, strengthening technology, organization, and human resources, museums engage users and audiences, leading to social and public innovation within social and cultural ecosystems.

Keywords: *museums, innovation, information technology, user participation.*

Introduction

As production-centered, intensive-information, and knowledge-oriented organizations, museums collect, preserve, research and display cultural heritage, connecting the past with the present (Marty, 2007a; Freedman, 2000; Gilmore & Rentschler, 2002; Bonacini, 2012). Museums are using the potential offered by information technology in order to drive innovation for value creation to achieve the traditional mission of education, knowledge, and culture dissemination (Vicente, Camarero, and Garrido, 2012), promoting audience involvement for cultural heritage knowledge and innovation (Kelly, 2010; Schweibenz, 2011; Bakhshi &Throsby, 2010).

Museum is emerging as a community that strengthens the relationships with audiences as a source of information, knowledge sharing, and creation within cultural ecosystems (Borin & Donato, 2015).

Museums develop technological innovation in order to increase organizational performances and achieve cultural and social objectives (Camarero & Garrido, 2008), driving value co-creation processes (Antòn et al., 2018), and following an audience-centered orientation (Consiglio et al., 2017).

Visitor orientation helps to foster technological innovation within museums (Camarero & Garrido, 2012). Museums contribute to constructing service experiences, enabling the audience to actively contribute to the definition of cultural heritage contents, strengthening the relationships between technology, the public, and the museum as an innovation-driven organization (Schweibenz, 2011; Camarero & Garrido, 2011; Garrido & Camarero, 2010; Camarero et al., 2015).

As agents and spaces of social and cultural innovation (Castells, 2001), museums develop user-led innovation, strengthening the cultural participation of users in creating and sharing museum content and knowledge (Russo, 2011). Innovation helps engage the audience, and develop and improve the organization, business model, and management (Bakhshi & Throsby, 2010) even if a clear definition of what innovation is is lacking.

This study helps identify the trajectories that museums are following, using the potential offered by information technology to drive innovation by involving the audiences as users in cultural heritage and developing the museum as a community. In transitioning from being custodial and collections-driven institutions to becoming audience- and cultural heritage production-oriented institutions, museums contribute to a social, economic, cultural, and public value within cultural ecosystems (Borin & Donato, 2015; Freedman, 2000; Gilmore & Rentschler, 2002; Bonacini, 2012).

Museums contribute to developing and sharing knowledge and information about heritage within cultural ecosystems (Borin & Donato, 2015). Technologies help museums to build a shared authority with the active audience on cultural heritage contents definition. Museums develop technologies to encourage user participation, involving potential visitors to take part in the production and value creation regarding cultural heritage (Anderson, 1999). Museums embrace technology to cede authority, enabling staff and users to develop interactive-collaborative processes for knowledge transfer and information sharing (Kelly, 2010; Schweibenz, 2011).

The study is structured in seven sections. Following the introduction and methodological section, in the third section museums emerge as communities. The fourth section elucidates how museums drive innovation by using the potential offered by technology to involve the users to contribute to cultural knowledge issues. In the fifth section, technologies drive museums to develop innovation: technology enables museum professionals to deal with information and knowledge as advocates and user-centered mediators. Technology helps museums to develop a shared authority on cultural heritage with the public. Finally, the discussion and conclusions are outlined.

Methodological section

This study aims only to provide an interpretive and qualitative framework. The research is based on archival and qualitative considering the literature related to the role of the Internet, and virtual and interactive technologies as a means that enables museums to contribute to driving innovation for creating social and cultural value by opening up to increasing user involvement and participation in the definition of cultural heritage contents. The analysis tends to elucidate how museums support and drive innovation by using the potential offered by information and digital technology as applied in the cultural heritage field. Referred journal articles were selected from *Google scholar* as the main web source and database. The selected contributions are summarized and interpreted (Denyer and Tranfield, 2006) in a narrative synthesis that accommodates differences between the questions, research design, and the context of the studies to develop new perspectives on emerging issues and advance theoretical models (Dixon-Woods et al., 2004).

Museums as communities that deal with information and knowledge

Museums are memory institutions and information-driven utilities (Bagdadli, 1997; MacDonald & Alsford, 1991; Marty, 2007a). As a community of stakeholders and knowledge municipality, the museum legitimizes processes of information and knowledge acquisition, creation, and dissemination (MacDonald & Alsford, 1991; Marty, 2007b; Freedman, 2000). Museums acquire, conserve, research, communicate and exhibit for study, education, and enjoyment, serving society (ICOM, 2004), enabling knowledge and critical reflection on the past (Hooper-Greenhill, 1995).

Museums drive innovation to rethink the museum as an audience-oriented, knowledge-oriented, and information-based institution. Museums play a social role for citizens, truth, and rights (Knell, 2019). Museums support social and public value creation because they contribute to an enlightened society. They contribute to social capital and value for society, driving visitors to assume informed behaviors in an increasingly globalized world (Burton & Scott, 2007; Kelly, 2006).

Museums increasingly involve visitors and communities in many ways, fostering participation and involvement in cultural projects (Simon, 2010), promoting future and sustainable development engaging the public within communities (Crooke, 2007). The audience is an active agent influencing how museums act and represent what a museum examines (Karp, 1992). As a community space, museums promote technological and organizational innovation (Camarero & Garrido, 2012). Museums contribute to building social capital within a community whereas museums and users share the same interests and goals (Rounds, 2012).

Museums of the future contribute to empowering local communities (Greffeet et al., 2017), strengthening relations and exchanges within social and cultural ecosystems (Sabiescu and Charatzopoulou, 2018), building partnerships, and involving the audience (Scott, 2006). As knowledge-oriented and information-driven organizations, museums open up to flexible and multiple interpretations of knowledge and understanding, rediscovering constantly meanings when the truth is dependent on context (Davies, Paton, and O'Sullivan, 2013).

Museums use the information as what can be communicated to people and knowledge as the result of the interaction (Orna & Pettit, 2010). As information-based organizations, museums contribute to creating information and knowledge (Bagdadli, 1997; MacDonald & Alsford, 1991; Marty, 2007a; Freedman, 2000), providing new and authentic knowledge cultural knowledge education to their audience (Russo & Watkins, 2007).

Museums driving innovation by information technology

Innovation is a key source that helps drive museums towards strategic and organizational changes for value creation (Camarero & Garrido, 2012). Innovation supports the value chain within cultural organizations, strengthening interaction and communication among providers and users of cultural services (Bakhshi & Throsby, 2010). Innovation refers to new systems, technologies, and processes that change the museum's relationship with visitors and communities. (Vicente et al, 2015).

Museums contribute to democratizing knowledge about cultural heritage contents, driving user and community innovation within cultural ecosystems (Von Hippel, 2005; Bautista, 2014), and engaging the audience as an active agent influencing how museums act and represent meanings and understanding (Kelly, 2010; Schweibenz, 2011; Russo and Watkins, 2007). Museums develop innovation by adopting a technology-driven, visitor-oriented, and organization-based view to change and value-creation processes (Vicente et al, 2012).

Museums tend to promote innovation, creating a new public sphere of knowledge, innovation, and learning (Weibel, 2018), engaging with a working audience to support innovation-driven and value-creation-oriented processes (Balogun, Best & Lê, 2015), and communication (Hooper-Greenhill, 2007).

Museums develop technological innovation in services or production processes to achieve cultural and social objectives, support visitor orientation (Camarero, Garrido, and Vicente, 2011) and increase organizational performance (Camarero & Garrido, 2012; Camarero & Garrido, 2008), promoting value co-creation processes (Antòn et al, 2018), and improving social and financial performances (Garrido & Camarero, 2010).

As social agents of change and spaces of cultural innovation (Castells, 2001), museums engage and involve the public in defining cultural heritage contents and creation (Antòn et al, 2018). Museums promote innovation, engaging the public and encouraging the building of partnerships within the community (Søndergaard & Veirum, 2012), achieving social or economic purposes, using processes and techniques (Holden, 2006). Museums achieve a positive impact with regard to the relationships with the audience, by adopting digital technology applications and innovative services (Tsaih et al, 2014).

Driving innovation by promoting a 'shared authority' on cultural heritage

The advent of information technology helped museums to drive innovation in providing information sources accessible to users (MacDonald & Alsford, 1991). Technology helps museums to redefine cultural authority within a changing society, opening up to user participation and partnership with an audience, driving the visitor as an active participant in knowledge creation (Mancini & Carreras, 2010; Bautista, 2014), empowering the museum visitors as producers of knowledge and active contributors in value creation processes (Schweibenz, 2011; Simon, 2010; Scott, 2010).

Museums promote innovation by developing the potential of technology, sharing authority on cultural heritage, and enabling staff and users to develop cultural experiences and interactive-collaborative processes that rely on knowledge transfer and information sharing within the museum community. In embracing interactive technologies, museums are changing moving from being consumption-centered/custodial and collection-driven institutions to becoming increasingly production-centered/audience-driven institutions that support bidirectional-participatory, dialogic interaction and bottom-up communication (Gilmore & Rentschler, 2002; Bonacini, 2012; Capriotti & Kuklinski, 2012).

Technology helps museums drive innovation by democratizing knowledge in the cultural heritage field. Engaging the public helps support the museum as a knowledge-oriented community. Museums contribute to innovation by encouraging dialogue and

conversations through information technology by strengthening user involvement and audience participation.

Technology helps provide an emotional space by empowering visitors to re-understand the objects (Bearman & Gebra, 2008). Museums construct a *shared authority* on cultural heritage contents involving the audience, and ceding authority by developing the potential of interactive technology and sustaining a two-way communication with visitors, driving the active participation of users as producers of knowledge (Kelly, 2010; Schweibenz, 2011; Russo et al., 2008).

In particular, information technology helps museums enhance the importance of sharing authority with the audience on cultural heritage knowledge by encouraging active participation and sustaining visitors' learning experience (Hazan, 2007).

Museums build social capital and awareness about cultural heritage and community development, leading toward a shared authority between the museum and the public (Schweibenz, 2011; MacDonald & Alsford, 1991).

As a platform for creating culture and knowledge, museums use virtual and digital technologies to support the interaction and communication between the visitor and museum information and knowledge sources (Styliani et al., 2009).
Virtual environments enable cultural institutions to involve the audience in cultural production by interacting with digital objects (Carrozzino and Bergamasco, 2010). Web applications contribute to interactive information sharing and user-centered design and collaboration, leading to a shared authority between staff and communities experimenting with user-led cultural content generation, focusing on the value of the museum community (Kelly, 2010; Schweibenz, 2011).

Museum professionals as user-centered mediators

Museums develop the potential offered by information and communication technologies to enable museum professionals to meet changing user needs (Marty, 1999). Technology is enabling museums to become a key source for information acquisition. In particular, information technology has redefined the museum's role as an environment where information professionals must manage knowledge (Marty, 2007a). Technologies enable museums as knowledge and intensive information organizations that contribute to creating new knowledge about cultural heritage (Freedman, 2000; Marty, 2007b).

Museum professionals are acting as user-centered mediators meeting the needs of visitors. New advanced technology and museum informatics enable museum information professionals to act as user-centered mediators that help design and implement interactions between museums and users, making information resources available and meeting the information needs and coherently responding to expectations of museum information resource users (Marty, 1999; Marty, 2007b).

Technologies enable museum information professionals to develop new methods of information organizing and accessing collections in order to generate new knowledge for their audience (Marty, 2007a; Freedman, 2000). As repositories of knowledge and service-oriented information organizations, museums improve the organizational processes, strengthening the work and skills of museum professionals as curators and

educators, and encouraging collaboration among museum professionals and museum users (Marty, 2011).

The Internet and interactive technologies enable museums as information-based organizations (Marty, 2006; Marty, 2007b), leading museum professionals to use information technology to meet and support the changing needs and expectations of visitors, improving the museum experience for users by focusing on digitization technologies, information policy, and collaboration initiatives (Marty, 2011).

Technology is leading museum professionals to develop new capabilities and take the advantage of new capabilities. Technology helps museum professionals to serve as user-centered mediators, enabling the users as active participants in the co-construction of digital knowledge and cultural heritage to interact with museum information resources (Marty, 2006; Marty, 2007a; Marty, 2011).

Discussion and conclusions

Today, museums as organizations play a social role within the contemporary world, driving innovation by employing and valuing the potential of new internet, virtual and interactive technologies applied to the interaction between objects, information, users, museum, and communities.

Innovation helps shape sustainable and people-centered museums that improve the quality of life within communities. As a bridge between information and knowledge, museums select an innovation-driven orientation in order to promote social and technological changes within the organizational infrastructure, rediscovering a pathway for strengthening the relationship with audiences, fostering user involvement, and engaging visitors.

As audience-centered and visitor-oriented institutions, museums promote innovation by sharing knowledge and communication on cultural heritage content. Driving innovation for value co-creation processes helps museums to bring together technology, people, and organization. As organizations museums develop the potential offered by information technology, strengthening museum professionals in order to support participatory engagement by involving the users to contribute to knowledge and meanings in cultural heritage.

The contribution of this study is to elucidate how museums aim to identify a pathway for driving innovation by using technology to employ museum's professional and human resources, opening up to the users as active participants and co-producers of knowledge as sources for driving value co-creation processes as shown in figure 1.

Fig. 1. Towards museums driving innovation: a framework of analysis

	From recipients	To user participation
From providing information	Museum as information-led organizations	Museums promoting communication as innovation
To meeting users	Museums driving Innovation by involving	Museums as Communities
	from Organization	to Ecosystem

As information-oriented institutions, museums provide information focusing on organization. Museums drive communication-led innovation, enabling museum professionals as user-centered mediators. Museums provide information in order to support user participation. They behave as communities, strengthening the role of museum professionals as user-centered mediators, and opening up to active user participation and involvement. The user acts proactively to interact with museum information and knowledge.

Technology is driving museums to drive innovation for value co-creation processes in cultural heritage, meeting the changing needs of users and designing the virtual museum, developing the role of museum information professionals as users-intermediates between the public and the museum's knowledge and information source, and, opening up to the participation of the audience to cultural meanings creation.

As audience or collection-driven organizations museums select a different pathway, sharing and combining authority and participation in cultural heritage contents, developing the capabilities of museum professionals, and strengthening the opportunities provided by new virtual and interactive technologies for leading to a participatory museum as a learning-oriented and educational institution.

There are some limitations. The study aims to provide a theoretical framework to understand how museums develop as community-based organizations living as innovation-led institutions within cultural ecosystems. The study is descriptive and exploratory. Further research should investigate how museum innovation enabled by the use of information technology leads to arrangements and redesign in the organizational structure and human resource management within museums.

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