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Digital Transformation in Museum Management: The Usage of Information and Communication Technologies

Müze Yönetiminde Dijital Dönüşüm: Bilgi ve İletişim Teknolojilerini Kullanma Düzeyleri

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Abstract: Today, museums are undergoing a process of digital transformation. Those museums able to properly manage this process will hold the potential of following and analyzing consumer perceptions and emotions. Information and Communication technologies are an important part of this digital transformation. This study aims to put forth the relationship between digital technologies and museums in terms of participatory technologies. The focus of the study will analyze at which stage private museums in Istanbul are at in the digital transformation process. The study is made up of three steps in order to measure the level at which museums utilize information and communication technologies. The first step takes place prior to the museum visit and analyzes the museums' corporate websites. The second step is in relation to the visit of the museum, and defines the information and communication technologies available for visitors. The final step determines the social media presence of the museums after the visitation. The study analyzes the degree to which information and communication technologies are used by museums under the supervision of Turkey's Ministry of Culture and Tourism's General Directorate for Cultural Heritage and Museums in Istanbul. As a result of the study, the museums have been categorized under four categories: sleepers, social-oriented, visit-oriented and experience-oriented. Of the 62 museums within the framework of the study, 24% are sleepers, 36% social-oriented, 24% visit-oriented and 16% are experience-oriented. It is believed that the study will serve as a guide for museums which took part in the study so that they can increase the participatory experience of visitors.

Structured Abstract: With new museology paradigms, museums began to transform themselves into equipment usable for the information and entertainment society to develop audiences and adopted strategies that prioritize ICT. ICT has the potential to significantly increase participation in cultural activities and at the same time provide cultural organizations with tools to monitor and analyze consumer perceptions and emotions. This article aims to reveal the relationship between digital technologies and museums in the context of participatory technologies. From a structural instructive perspective, several sources (observation, web sites, internal files, publications, and museum's corporate communication) have been gathered and analyzed through the ethnographic method. In the context of the research, the museums in Istanbul under the authority of the General directorate of cultural heritage and museums have been examined in terms of their usage of ICTs. As of January 8, 2020, there was 269 private museums under the authority of the Ministry. Out of these 269 private museums, 62 of them were in Istanbul. The research analysed the corporate websites of these museums with an ICT Facilities Evaluation Form aimed at mapping their technological services (De Bernardi et al., 2018:

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458). The technological services examined were grouped into three stages of museum visits: Pre-visit, visiting, post-visit.

In order to analyze the first stage in the research, museums must have a corporate website. Among 62 private museums, 47 of them have corporate websites. Therefore, the research continued with 47 museums. In the pre-visit stage, which is the first stage of the research, the corporate websites of the museums and other corporate websites from which they get support in ticket sales were used. While analyzing the pre-visit phase; online ticket sales, virtual catalog service, introduction text and photos of the museum, video of the museum, news bulletins, press releases, use of blog/forum, e-mail option for requests and suggestions, online product sales, interactive museum map, interactive museum transportation map and traditional museum transportation map options were discussed. The second phase of the research is the visiting phase. The facilities offered during the visit phase are categorized in two ways; stationary technologies and mobile technologies (De Bernardi et al., 2018: 462). Stationary technologies; projection screen, touch screen/interactive table, QR technology, 3D screen, working and/or playground and virtual reality. Mobile technologies; Audio guide, video guide, application for smart phones, free Wi-Fi, audio guide for the visually impaired and video guide for the hearing impaired. At this stage, only 46 museums could be analyzed as the rest were closed to visitors due to renovation activities. It has been determined that museums are at very low levels of ICT services they offer during the visit phase. In the post-visit phase, which is the final phase of the research, the existence of museums on social media is examined. Museums that exist on social media can test the satisfaction of visitors and make notifications to encourage their loyalty attitude. It is seen that museums are active on Facebook with a rate of 74.47 percent. Second place is Wikipedia and Instagram with 57.45 percent. While 23 museums have accounts on Twitter, 16 of them have accounts on Youtube. Museums seem to prefer Vimeo, Pinterest, Google Art Project and Flikr less.

According to the data collected, a small number of museums understand the importance of incorporating digital technologies to the visitor experience which would assist in the development of the museum and the city's tourism. Most of the private museums in Istanbul fulfill a research and protection function as referential institution. Four types of museums emerge in the analysis: sleepers, social-oriented, visit-oriented, and experience-oriented (De Bernardi & Gilli, 2019: 163). Museums without a corporate website were categorized as sleepers. Out of the 62 museums included in this research, 15 (24%) were categorized as sleepers. These museums do not bond with their visitors prior to or after their visits. Social - oriented museums (36%) have invested in social media and web services. They also connect with their visitors on a daily basis and form a following. These museums use digital technologies only prior to and after the visit, and not during. Visit - oriented museums (24%) not only see digital technologies as consisting of social media use, but they also use them as a tool to improve the visit itself. Finally, experience-oriented museums (16%) see the visit itself as an immersive experience, in addition to having a social media presence and digitalizing their contents. While some museums use 3D screen or giant screens surrounding the visitors, others use interactive technologies.

Private museums in Istanbul should increase their ICT services, taking into account the increasing interest of visitors in digital technology. However, this digitization process should be managed in accordance with the unique characteristics of museums. Criteria such as the foundation year of the museum, organizational structure, budget policy, and the features of its collections play an active role in the digital transformation process. The presence of the museums subject to the study on social media is at a high level. Social media visibility, which is the first step of a museum that wants to promote digital innovations, does not have high costs in the first stage, as it does not require a professional staff. However, if a museum wants to use social media to define target-oriented marketing strategies, it needs to establish a professional staff. The limit of research is that it is conducted taking into account the information found on the websites of the museums. This could mean that some museums may have services that may not be visible on the web. In this case, the deficiency is not in the services but in the digital communication activity of the museum. The study is limited to private museums in Istanbul. It aims to summarize how and to what extent digital technologies are spreading today, when digital technologies are becoming increasingly important in the culture industry. The research offers implications for museum administrations that allow, firstly, to encourage the digitization of museums' business models, and secondly, to increase their competitiveness through effective participatory strategies for visitors.

Keywords: Management, Museum Management, Digital Transformation, Information and Communication Technologies, Digital Museums.

Öz: Günümüzde, müzeler dijital dönüşüm sürecindedir. Bu süreci iyi yönetebilen müzeler, tüketici algılarını ve duygularını takip etme ve analiz etme potansiyeline sahip olacaktır. Bilgi ve iletişim teknolojileri (BİT), dijital dönüşümün önemli bir parçasıdır. Bu çalışma katılımcı teknolojiler bağlamında dijital teknolojiler ve müzeler arasındaki ilişkiyi ortaya koymayı amaçlamaktadır. Araştırmanın odak noktası, İstanbul'da yer alan özel müzelerin dijital dönüşüm sürecinin hangi aşamasında olduğunun analiz edilmesidir. Araştırma, müzelerin bilgi ve iletişim teknolojilerini kullanma düzeylerini ölçümlemek için üç aşamadan oluşmuştur. İlk aşama olan ziyaret öncesi aşamada, müzelerin kurumsal web siteleri incelenmiştir. İkinci olarak ziyaret aşamasında, izleyicilere sunulan bilgi ve iletişim teknolojileri hizmetleri tanımlanmıştır. Son aşama olan ziyaret sonrası aşamada ise müzelerin sosyal medyadaki varlıkları tespit edilmiştir. Araştırma kapsamında, T.C. Kültür ve Turizm Bakanlığı Kültür Varlıkları ve Müzeler Genel Müdürlüğü denetiminde İstanbul'da hizmet veren müzelerin, bilgi ve iletişim teknolojilerini kullanma düzeyleri incelenmiştir. Araştırma sonucunda müzeler, pasif, sosyal odaklı, ziyaret odaklı ve deneyim odaklı olmak üzere dört türde analiz edilmiştir. Araştırma kapsamına alınan 62 müzenin yüzde 24'ü pasif, yüzde 36'sı sosyal odaklı, yüzde 24'ü ziyaret odaklı ve yüzde 16'sı deneyim odaklı olarak tespit edilmiştir. Çalışmanın, İstanbul'da yer alan müzeler özelinde, dijital dönüşümün gerektirdiği değişimleri saptayarak ziyaretçilerin deneyimlerine daha fazla katılım sağlayacak yönetimsel bir iyileştirme süreci konusunda yol gösterici olacağı düşünülmektedir.

Anahtar Kelimeler: Yönetim, Müze Yönetimi, Dijital Dönüşüm, Bilgi ve İletişim Teknolojileri, Dijital Müzeler

Introduction

Guillaume Budé, Lexicon Greco-Latino (1554) have defined museums as "it was a place dedicated to the Muses and to the study that was occupied by each of the noble disciplines" (Fernandéz, 1995: 27). Over time, this definition has evolved according to political, social, and economic contexts. In Europe, prior to the Enlightenment, gathering individual collections from centuries-past appeared. These collections are perceived as the first examples of the modern museum and appeared in something called cabinets of curiosities. In the cabinets of curiosities, all types of objects could be gathered and put next to one another according to the subjective method of categorization of the collector. In the 19th century, certain private collections were open to the public and the modern museum appeared. In the 20th century, the "age of information" has changed the meaning and the structure of museums. In time, different types of museums started to appear, while with the advent of computers, internet technology, and scanners, the concept of virtual museums was laid out and discussed (Kızılhan, 2017: 150).

During the 139th International Council of Museums board of management meeting, which took place in Paris on July 21 and 22, 2019, a new definition for the museum was announced (ICOM, 2020): museums are democratizing, inclusive, and heterogeneous spaces where critical dialogues about the past and the future unfold. By accepting the conflicts and difficulties of today, they hold works and examples in safe spaces for future generations and provide equal rights by allowing equal access to all human heritage. Museums are non-profit. They are participatory, transparent, and aim at global equality by participating to global prosperity. They work towards gathering different perspectives from around the world and protecting those perspectives. They work towards active commonalities through research, interpretations, exhibitions and development. In the definition provided above, it can clearly be seen that museums serve social progress by using social education as a primary tool. The definition demonstrates that the international museum community clearly wants to portray museums as all-encompassing and open-minded. Traditional museums have to be reviewed in relation to new technological developments to see how physical exhibitions, exhibition boards, and scenes can be reconfigured, as well as underline what is necessary to development in

terms of existing ideas and potential new ones (Langan et al., 2016: 103). The mission of the museum is to provide service as a public welfare institution, where they research cultural ruins and propagate their expansion. At the same time, they should incorporate new concepts in order to make museum management and services more humane (Johnson, 2014: 377). The modern paradigm of the mission of museums requires innovative methods and tools for scientific research and applied informatics. Open access electronic sources have become a useful database for the storage of cultural heritage, national history, and cultural relations (Hookk, 2014: 70). The focal point has shifted from the works to the individuals. Researchers and scientists referencing museum objects have become the focus of talk. Museums aimed at being innovative and effective require scientific collaborations with various institutions. Research shows that museum visits increase when people want to avoid social disasters or when there are economic and political instabilities. Museums have close ties with social stability and relate to traditional values. At the same time, digital and communication technologies have led to changes in the classical functioning of museums.

The traditional function of the museum is to gather objects while protecting and examining them. The museum administrator is perceived to undertake the responsible role of protecting the objects in the name of the institution's cultural capital. Today undertaking this role requires understanding control mechanisms as well as drawing the attention of visitors. Marketing approaches have been used in order to increase visitor numbers, and promote, change and extend the understanding of the museum in terms of a specific emphasis to marketing. In this sense, museums use marketing techniques to increase their success. Changes in museum marketing reflect changes in the role of the administrator. Museum marketing has been conceptualized during three main periods (Rentschler & Geursen, 1999: 10). In research conducted on the establishment period (1975–1983), articles concentrated on issues such as the management of visitors, raising the awareness of museum personnel regarding visitor studies, and the economic effects of art on society. The first two groups of articles concentrate more on data collection than strategic actions. During the professional era, museums become more democratized (1988–1993). These changes have rendered the application of marketing for non-profit art organizations more difficult and have thus led to the creation of a marketing unit for museums (Ames, 1989: 8). The structural innovations in the public sector have led to the shift in power and authority from producers to consumer. Furthermore, they have been effective in the request of funders to take on more responsibility and the narrowing of services on the local level. This had led to a new elite management which concentrated less on the protection of culture and more on the enthusiasm of entrepreneurship (Volkerling, 1996: 203). At the moment, the management of museums is undergoing a transition period known as the entrepreneurial period (since 1994). Recently, through collaborative marketing models, new visitors, products, spaces and multiple artistic experiences have been attained, thus diversifying sources of income (Radbourne, 1997: 278). With this change, the nature of the relationship between "visitor, museum, and market" has become the focal point (McLean, 1997: 185). These changes have affected the structure of museums, and internal cultural organization such as the diversity in services. These changes have led to the need for museum administrators to hold characteristics pertaining to marketing administrators, or, in the least, to follow their guidance. Rentschler (2001: 16) has defined four types of museum administrator. Each one underlines a different aspect of museum services. For example, it concentrates on the advancement of the organization through entrepreneurial, creative programming. Some aspects of this approach include the changing exhibitions, defining donors, getting into contact with major donors, using advisors in a strategic manner, and preparing market analysis in order to create funding. The entrepreneur uses marketing programs in order to encourage visitors to become members and then, eventually, donors themselves. On the other hand, the museum administrator concentrates on traditional research and collection events. Museum administrators are less involved in business events. For example, they do not use advisors or prepare industry analysis; they do not research non-visitors nor they do not encourage visitors from becoming members or donors (Griffin et al., 1999: 38). In professional bureaucracies, the agenda is set by addressing colleagues outside of the

institution as opposed to within. For this reason, the style and management choices made by administrators cannot be equally dispersed throughout the museum.

With the new museum paradigms, they have begun to transform by using elements of the information and entertainment society to develop audiences and appropriates strategies which prioritized information and communication technologies.

Even though new technologies and new scenarios are presented both in academia and the industry, the goal is not to develop new technologies, but to plan for ways to integrate technologies (Cano et al., 2010: 98).

Digital Transformation

While creating new job and socialization opportunities, digitalization challenges traditional work design. For this reason, it is seen as a disruptive novelty. This challenge brings about changes in individuals and organizations. Employees are forced to develop emotional and creative competence and know-hows based on technological expertise and data analysis (Colbert et al., 2016: 733). As a result, organizations have to redesign their structures and processes (Kane et al., 2016: 16). Industry 4.0 has changed the relationship between employees and machines. Labor once conducted by employees can now be done by machinery. This way, costs are cut and employees are more independent and carry more authority in their duties (Holland & Bardoel, 2016: 2580). Industry 4.0 has also changed the space and time of labor: concepts such as smart-work, agile work, new virtual productions are examples of new work design concepts appearing and these examples allow for big work groups to work better together and provide more output, while also defining goals for better development and motivation as well as real-time feedback (Sonnentag et al., 2008: 681). Digital transformation is defined as the transformation of work events, processes, competencies, and models by aligning them with the changes and opportunities in digital technologies (Betchoo, 2016). It can also be expressed as a technology-based change at many levels that organizations undergo so that they can improve their already-existing processes and make use of digital technologies and discover digital innovations (Berghaus & Back, 2016: 2). It can be defined as a disruptive or incremental period of change that organizations undergo to adapt to a new digital economy (Hess et al., 2016: 124). Digital transformation is directed by economic trends (such as globalization and a sharing economy), technological demands, and consumer tendencies (Seeger & Bick, 2013). Studies show that 84% of organizations are making efforts to develop a vision, plan, and application for digital transformation, not because they see it as an organizational mission, but because they see information technologies as a benefit (Ganguly, 2015: 10; Rogers, 2016). Digital transformation is realized through the digitalization of work systems. Digitalization transforms analogue material into a digital format and double digits (Hess et al., 2016: 129; Tilson et al., 2010: 749). It entails a socio-technical process in which digitalization techniques are applied to a wider social and institutional context (Tilson et al., 2010: 749). Digital transformation can be offered in three manners: customer-based, organization-development-based, or technologically-based (Hrustek et al., 2019: 1306). Customer-based digital transformation is developed according to the desires and needs of customers. Organization-development based digital transformation is developed with the goals of increasing profit, cutting costs and maintain output. As for technology-based digital transformation, they are changes and opportunities stemming from digital technologies. The concepts in technology-based digital transformation are SMACI, censors, request-based information, mobile information and blockchain.

Management of Information and Communication Technologies

Nowadays, technology is important for museums. Information and communication technologies (ICT) have earned an important role in the acknowledgment and spread of information and its services. ICT's hold the potential of creating an increase in participation in cultural activities as well as providing tools for cultural organizations that follow and analyze consumer perceptions

and emotions (Bertacchini & Morando, 2013: 63). According to Kindberg and Fox (2002: 70), the natural and intense work collaboration between calculated elements and components of the physical world expresses a smart space. This is a necessity not considered when developing traditional applications known to be predecessors and limited. However, in smart spaces, physical integration is a common characteristic yet, its dynamic sustainability and its initial position are not well known. These environments provide an attractive idea regarding the accessibility of information all the time and everywhere. At the same time, there are obstacles in the development of these applications: the constantly changing environment and applications, while protecting effectiveness, should also comply with implementation (Grimm, 2004: 22). The presumptions are similar when approaching the situation from the point of view of viewers. Smart spaces have tourist-oriented goals. Actors in this ecosystem value their experiences (Buhalis & Amaranggana, 2014: 554). These experiences are personalized and evaluated in real time (Buhalis & Amaranggana, 2015: 387). Smart museums focus on the space of the museums in order to develop the cultural experience. They should present visitors with information regarding the objects in the museums and personalize their experience according to their areas of interest (Kuusik et al., 2009: 477). The visitors have started to concentrate on objects and visitation spaces (Alletto et al., 2016: 244). Today, ICTs, web, and social media are transforming the management model of museums. Internet of things is widening the scope of the traditional functions of museum with smart products and the spread of technologies.

Research

This article aims to reveal the relationship between digital technologies and museums in the context of participatory technologies. From a structural instructive perspective, several sources (observation, web sites, internal files, publications, and museum's corporate communication) have been gathered and analyzed through the ethnographic method. In the context of the research, the museums in Istanbul under the authority of the General directorate of cultural heritage and museums have been examined in terms of their usage of ICTs. As of January 8, 2020, there was 269 private museums under the authority of the Ministry. Out of these 269 private museums, 62 of them were in Istanbul. The research analysed the corporate websites of these museums with an ICT Facilities Evaluation Form aimed at mapping their technological services (De Bernardi et al., 2018: 458). The examined technological services have been divided into three stages in line with museum visits:

• Stage pre-visit: the evaluation of services on the museums website and social media influencing the decision to visit.

• Visiting stage: the evaluation of technological possibilities offered to visitors during their visit at the museum.

• Stage post-visit: the evaluation of online services aimed at testing visitor satisfaction and encouraging their loyalty.

New technologies hold functions beyond unforgettable interactive experiences during the visit. For example, prior to the visit, these technologies can provide an online virtual tour for visitors in order to facilitate their decisions or they can present online ticketing possibilities. Internet of things are also important post-visit. This leads to loyalty from visitors through initiatives aimed at meeting the needs of customers.

The museums must have a corporate website for the first stage of this analysis. Out of the 62 museums in Istanbul, 47 of them have a corporate website. This is why, only 47 of the museums were included in the research.

In the first stage of the research, the museums' corporate website and other websites used for tickets sales have been employed. In this analysis, the following options were evaluated: online ticket sales, virtual catalogue services, the presentation text and photographs of the museum, the video of the museum, news bulletins, press bulletins, use of blogs and forums, option for sending an email for

requests and advice, online product sales, interactive map of the museum, interactive map of how to reach the museum, and a traditional map describing how to get to the museum. The sample size fell to 23 when analyzing museums that conduct their own ticket sales versus those who conduct ticket sales through another website. The reason for this is that 21 of the museums do not have an entrance fee. Table 1 shows the frequency distribution of museums who offer information and communication technologies services through their corporate websites.

Table 1: ICT Facilities Offered on the Corporate Websites of Museums

Web Technologies	***No.***	***%***	***Web Technologies***	***No.***	***%***
Online ticket sales/ Online reservations	*2*	*8,69*	*Email for suggestions and requests*	*41*	*87,23*
Tickets sales via another website/ reservations	*6*	*26,08*	*Blog/forum*	*3*	*6,38*
Virtual catalogue	*16*	*34,04*	*Online product sales*	*11*	*23,40*
Introductory text of the museum/ photograph	*38*	*80,85*	*Interactive map of museum*	*8*	*17,02*
Video of the museum	*7*	*14,89*	*Interactive map to get to museum*	*29*	*61,70*
New bulletin	*41*	*87,23*	*Traditional map to get to museum*	*5*	*10,64*
Press bulletin	*43*	*91,49*			

Source: Authors' elaboration from the museum websites

When analyzing the 23 museums that have an entrance fee, it can be seen that their online ticket sales are low. The sale of workshop tickets was also added to the analysis. The data shows that 74% of the time, tickets are bought at the door in the museums of Istanbul. 34% of museums have a virtual catalogue, while interactive maps are offered by 8% of the museums. 81% of the time, museums had a presentation text and photographs from the museum present on their websites; however, only 14.89% of the time a video was present. News bulletins and press bulletins are shared with visitors to a high degree. Nowadays, emails are a preferred method of communication. Museums have considered this and have provided an email on their websites for visitor suggestions and feedback. The use of blogs and forum has only been observed in three museums. Museums stores are important sources of revenue for museums. It was observed that only 23.3% of museums provided online product sales to their visitors. Interactive maps describing how to get to the museums were only present in 29 of the museums. Many small and big businesses today use interactive maps, thus a 61.7% for museums is quite low. The use of traditional maps is dropping steadily and can only be found on the website of five museums.

The second stage of the research entails the stage of the visit. The analysis of the types of information and communication technologies offered to visitors during their time at the museum can be seen in Table 2. The options presented during the visits have been categorized into two: stable technologies and mobile technologies (De Bernardi et al. 2018, 462). Stable technologies are as follows: projection screen, touch screen/interactive table, QR technology, 3D screen, work and play areas and virtual reality. Mobile technologies include the following: audio guides, video guides, applications for smartphones, free Wi-Fi, audio guides for the visually impaired, and video guides for the hearing impaired. At this stage, only 46 museums could be analyzed as the rest were closed to visitors due to renovation activities.

Table 2: ICT Services Offered During the Visit

Fixed Technologies	***No.***	***%***	***Mobile Technologies***	***No.***	***%***
Projection screen	23	50,00	*Audio guide*	15	32,61
Touch screen/interactive table	11	23,91	*Video guide*	4	8,70
QR technology	16	34,78	*Applications for smartphones*	6	13,04
3D screen	7	15,22	*Free Wi-Fi*	27	58,70
Work and play areas	26	56,52	*Audio guides for the visually impaired*	1	2,17
Virtual reality	3	6,52	*Video guides for the hearing impaired*	1	2,17

Source: Authors' elaboration from the museum websites

The information and communication technologies offered during visiting hours is limited (Table 2). When looking at the data coming from stable technologies, even a standard technological facility such as a projection screen is only seen in 50% of the museums. Work and play areas are present in 26% of the museums. The reason for this might be that some of the museums are located in the personal villas or houses of individuals. The QR technology is found only 16% of the time. It can be said that the museums in Istanbul have not been adapted to 3D screens (15.22%) and virtual reality (6.52%) technologies. Mobile and stable technologies are at the same level. Free Wi-Fi is one of the most searched-for services that especially tourists look for. Free Wi-Fi is nowadays provided in most spaces, such as streets, airports, restaurants, and so forth. Only 58.70% of museums in Istanbul offer free Wi-Fi. Audio guides are only provided in 15 museums, while only 4 offer video guides. There are only 6 museums which have an application for smart phones. There is only one museum which provides audio or video services for visitors with disabilities. It is predicted that museums will increase their usage of stable and mobile technologies in the future.

The last stage of the research is the post-visit stage. This stage analyses the social media presence of the museums. Museums which have social media presence can test the satisfaction of museum visitors and send notification in order to create a sense of loyalty towards the museums (Table 3).

Table 3: Museums Presence on Social Media

Social Media	***No.***	***%***	***Social Media***	***No.***	***%***
Facebook	35	74,47	*YouTube*	16	34,04
Twitter	23	48,94	*Pinterest*	7	14,89
Wikipedia	27	57,45	*Flikr*	4	8,51
Google Art Project	6	12,77	*Vimeo*	10	21,28
Instagram	27	57,45			

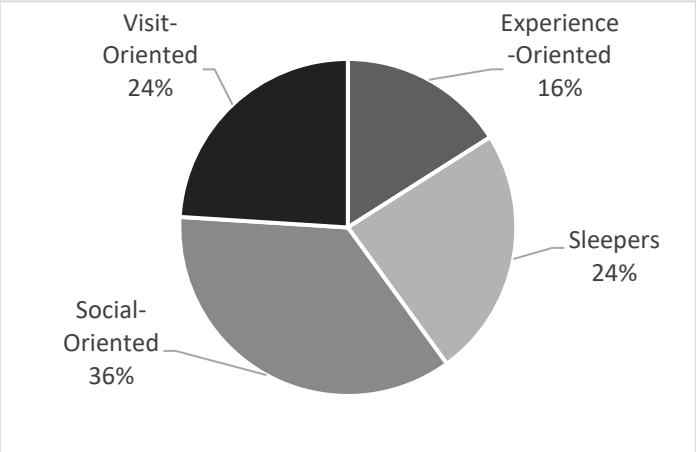
Source: Authors' elaboration from the museum websites

As seen in Table 3, 74.47% of museums are active on social media. Wikipedia and Instagram are second with 57.45%. 23 of the museums have a Twitter account, yet only 16 have YouTube accounts. It has been observed that museums prefer less to use Vimeo, Pinterest, Google Art Project, and Flikr.

Conclusion

This study aimed to analyse the digital technology services offered by museums under the authority of Turkey's Ministry of Culture and Tourism's General Directorate for Cultural Heritage and Museums in Istanbul. According to the data collected, a small number of museums understand the importance of incorporating digital technologies to the visitor experience which would assist in the development of the museum and the city's tourism. Most of the private museums in Istanbul fulfill a research and protection function as referential institution. The museums can be categorized into four according to the results of the analysis: sleepers, social-oriented, visit-oriented and experience-oriented (De Bernardi & Gilli, 2019: 163).

Figure 1: Types of museums in relation to digital technologies investments



Source: Authors' elaboration from the museum websites

Museums without a corporate website were categorized as sleepers. Out of the 62 museums included in this research, 15 (24%) were categorized as sleepers. These museums do not bond with their visitors prior to or after their visits. Social - oriented museums (36%) have invested in social media and web services. They also connect with their visitors on a daily basis and form a following. These museums use digital technologies only prior to and after the visit, and not during. Visit - oriented museums (24%) not only see digital technologies as consisting of social media use, but they also use them as a tool to improve the visit itself. Finally, experience-oriented museums (16%) see the visit itself as an immersive experience, in addition to having a social media presence and digitalizing their contents. While some museums use 3D screen or giant screens surrounding the visitors, others use interactive technologies.

Museums located in Istanbul should take into account the increasing visitor-interest in digital technologies and increase their information and communication technologies. At the same time, this digitalization process should be managed in line with characteristics specific to the museums. Criteria such as the museum's establishment year, organizational structure, budget policies, and collections can play an effective role in the process of digitalization. The museums that were part of the research have a high level of social media presence. Social media presence is the first step a museum takes when presenting digital innovation. This type of activity does not require a huge staff, thus is not high cost. However, if a museum wants to use social media in order to present goal-oriented marketing strategies, then a professional staff is required. The research is limited in that it only makes us of the information present on the museums' websites. This entails that museums may have services not visible on the internet. In this sense, the failure lies in the museum's digital communication, and not its lack of services. The study is limited to the private museums located in Istanbul. Digital technologies have gained importance in the culture industry. the degree and scope of the spread of digital technologies has been summarized. The research primarily encourages the digitalization of the work model of museums, and secondly provides arguments to increase their competitive edge by developing strategies of effective participation directed at visitors.

References

Alpay, E. (2019). Hak ve özgürlük gazetesinin Bulgaristan'da Türk kimliğinin şekillenmesindeki rolü (1991–1995). *Turkish Studies*, *14*(7), 3615-3629. http://dx.doi.org/10.29228/TurkishStudies.29444

Alletto, S., Cucchiara, R., Fiore, G.D., Mainetti, L., Mighali, V., Patrono, L. & Serra, G. (2016). An indoor location-aware system for an iot-based smart museum. *IEEE Internet of Things Journal*, 3(1), 244-253. http://doi.org/10.1109/JIOT.2015.2506258

Ames, P.J. (1989). Marketing museums: means or master of the mission. *Curator: The Museum Journal*, 32(1), 5–15. http://doi.org/10.1111/j.2151-6952.1989.tb00702.x

Berghaus, S. & Back, A. (2016). Stages in digital business transformation: Results of an empirical maturity study. *10th Mediterranean Conference on Information Systems (MCIS 2016)*, 4-6 September, Cyprus Paphos, 1-17.

Bertacchini, E. & Morando, F. (2013). The future of museums in the digital age: New models for access to and use of digital collections. *International Journal of Arts Management*, 15(2), 60-72.

Betchoo, N.K. (2016). Digital transformation and its impact on human resource management: a case analysis of two unrelated businesses in the mauritian public service. *2016 IEEE International Conference on Emerging Technologies and Innovative Business Practices for the Transformation of Societies*, 3-6 August Mauritius, Balaclava. http://doi.org/10.1109/EmergiTech.2016.7737328

Buhalis, D. & Amaranggana, A. (2014). Smart tourism destinations *in Information and Communication Technologies in Tourism 2014*, ed. Zheng Xiang and Iis Tussyadiah, Springer, 553-564. http://doi.org/10.1007/978-3-319-03973-2_40

Buhalis, D. & Amaranggana, A. (2015). Smart tourism destinations enhancing tourism experience through personalisation of services *in Information and Communication Technologies in Tourism 2015*, ed. Iis Tussyadiah and Alessandro Inversini, Springer, 377-389. http://doi.org/10.1007/978-3-319-14343-9_28

Cano, J., Cano, J.C., Calafate, C.T. & Manzoni, P. (2010). Experiences in developing ubiquitous applications *in Designing Solutions-Based Ubiquitous and Pervasive Computing: New Issues and Trends*, ed. Francisco Milton Mendes Neto and Pedro Fernandes Ribeiro Neto Hershey, IGI Global, 97-112. http://doi.org/10.4018/978-1-61520-843-2.ch005

Colbert, A., Yee, N. & George G. (2016). The digital workforce and the workplace of the future. *Academy of Management Journal*, 59(3), 731-739. http://doi.org/10.5465/amj.2016.4003

De Bernardi, P., Gilli, M. & Colomba, C. (2018). Unlocking museum digital innovation. Are 4.0 Torino museums? *in Smart Tourism*, ed. Valter Cantino, Francesca Culasso and Gabriella Racca, McGraw-Hill, 453-471.

De Bernardi, P. & Gilli, M. (2019). Museum digital innovation: The role of digital communication strategies in Torino museums. *in Handbook of research on examining cultural policies through digital communication*, ed. B. Önay Doğan and D. Gül Ünlü, IGI Global. 161-181. http://doi.org/10.4018/978-1-5225-6998-5.ch008

Fernandéz, L.A. (1995). *Museología: Introducción a la Teoría y Práctica del Museo.* ISTMO.

Ganguly, A. (2015). Optimization of IT and digital transformation: Strategic imperative for creating a new value delivery mechanism and sustainable future in organization. *European Journal of Business and Innovation Research*, 3(2), 1-13

Griffin, D., Abraham, M. & Crawford, J. (1999). Effective management of museums in the 1990s. *Curator: The Museum Journal* 42: 37-53. http://doi.org/10.1111/j.2151-6952.1999.tb01127.x

Grimm, R. (2004). One.world: Experiences with a pervasive computing architecture. *IEEE Pervasive Computing*, 3(3), 22-30. http://doi.org/10.1109/mprv.2004.1321024

Hess, T., Matt, C., Benlian, A. & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quaterly Executive,* 15(2), 123–139

Holland, P. & Bardoel, A. (2016). The impact of technology on work in the 21st century: Exploring the smart and dark side. *The International Journal of Human Resource Management*, 27(21), 2579-2581. http://doi.org/10.1080/09585192.2016.1238126

Hookk, D. (2014). Illusion of attendance and accessibility: technological innovations in museums. *Her&Mus Heritage & Museography*, 6(2), 68-71.

Hrustek, L., Tomičić Furjan, M. & Pihir, I. (2019). Influence of digital transformation drivers on business model creation. *2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)*, 20-24 May, IEEE, 1304-1308.

ICOM. https://icom.museum/en/activities/standards-guidelines/museum-definition/ Accessed: 20.08.2020.

Johnson, N. F. (2014). Symbolic instruments and the internetmediation of knowledge and expertise. *Continuum*, 28(3), 371-382. http://doi.org/10.1080/10304312.2014.893986

Kane, G. C., Palmer, D., Phillips, A.N., Kiron D. & Buckley, N. (2016). Aligning the organization for its digital future. *MIT Sloan Management Review and Deloitte University Press,* July.

Kızılhan, T. (2017). Türkiye'deki sanal müzelerin içerik analizi tekniği ile değerlendirilmesi. *Yeni Medya Elektronik Dergi-eJNM*, 1(2), 149-156.

Kindberg, T. & Fox, A. (2002). System software for ubiquitous computing. *IEEE Pervasive Computing*, 1(1), 70-81. http://doi.org/10.1109/MPRV.2002.993146

Kuusik, A., Roche, S. & Weis, F. (2009). SMARTMUSEUM: Cultural content recommendation system for mobile users. *Fourth International Conference on Computer Sciences and Convergence Information Technology*, 24-26 November, IEEE, 477-482. http://doi.org/10.1109/ICCIT.2009.257

Langan, D., Schott, N., Wykes, T., Szeto, J., Kolpin, S., Lopez, C. & Smith, N. (2016). Students' use of personal technologies in the university classroom: analysing the perceptions of the digital generation. *Technology Pedagogy and Education*, 25(1), 101-117. http://doi.org/10.1080/1475939X.2015.1120684

McLean, F. (1997). *Marketing the Museum*. Routledge.

Radbourne, J. (1997). Creative Nation – a policy for leaders or followers? An evaluation of Australia's 1994 cultural policy statement. *Journal of Arts Management, Law and Society*, 26(4), 271-283. http://doi.org/10.1080/10632921.1997.9942966

Rentschler, R. & Geursen, G. (1999). Unlocking art museum management: Myths and realities for contemporary times. *International Journal of Arts Management*, 2(1), 9–21.

Rentschler, R. (2001). Is creativity a matter for cultural leaders? *International Journal of Arts Management*, 3(3), 13–24.

Rogers, B. (2016). "Why 84% of companies fail at digital transformation" *Forbes* https://www.forbes.com/sites/brucerogers/2016/01/07/why-84-of-companies-fail-at-digital-transformation/#7530b4e9397b Erişim tarihi: 20.08.2020.

Seeger, G. & Bick, M. (2013). Mega and consumer trends-towards car-independent mobile applications. *2013 International Conference on Mobile Business,* 27.

Sonnentag, S., Binnewies, C. & Mojza, E.J. (2008). "Did you have a nice evening?" a day-level study on recovery experiences, sleep, and affect. *Journal of Applied Psychology,* 93(3), 674-684. http://doi.org/10.1037/0021-9010.93.3.674

Tilson, D., Lyytinen, K. & Sørensen, C. (2010). Digital infrastructures: the missing is research agenda. *Information Systems Research*, 21(4), 748–759. http://doi.org/10.1287/isre.1100.0318

Volkerling, M. (1996). Deconstructing the difference engine: a theory of cultural policy. *The European Journal of Cultural Policy*, 2(2), 189–213. http://doi.org/10.1080/10286639609358014