

ITALIAN MUSEUMS FACING DIGITAL TRANSFORMATION: A MACRO, MESO AND MICRO PERSPECTIVE

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ABSTRACT

By integrating different theoretical perspectives, this research investigates how digital transformation affects the innovation process of organizations. In doing so, we rely on four exploratory case studies by Italian museums entering this transformation to draw on and integrate ideas from the framework proposed by Appio et al. (2021). We adopt the framework and confirm the urgency to consider digital transformation as a unified path based on three levels strictly interrelated. Importantly, we shed light on the peculiarities and the actions of each level. The combined results offer strong insights into the whole path.

KEYWORDS: digital transformation; museums; organizational challenges

INTRODUCTION

The increasing spread of new technologies is challenging organizations in every industry, transforming the existing, conventional organizational structures (Bonanomi et al. 2020) and leading them to rethink their processes and strategies to avoid becoming misaligned with the activities performed (Barley and Kunda 2001).

Nevertheless, on one hand it is still difficult to frame and define this phenomenon while, on the other, little empirical evidence is provided to detect how organizations are approaching digital transformation, how technology is transferred from a source to a recipient entity and how the related processes of innovation are managed.

As regards the former, providing a univocal definition of digital transformation is challenging (Appio et al. 2021), also because various terms (*i.e.* for instance digitization, digitalisation, digital transformation) are frequently used interchangeably in the extant literature (Mergel, Edelmann, and Haug 2019). In this paper, we rely on the definition provided by Kretschmer and Khashabi (2020), according to whom the transformation caused by the adoption of digital technologies is expected to bring key changes to business operations, processes and organizational structures.

Concerning instead the latter problem, we aim to contribute to the extant knowledge by analysing four Italian organizations that are facing the challenges in the interplay of digital transformation and strategy, organizing and management (Lanzolla et al. 2020).

This study is grounded in the empirical context of Italian museums, following two main criteria: on one side, the challenges they face represent the ones that institutions are encountering when dealing with digital technologies (Agostino and Costantini 2021); on the other, the choice of this sample allows us to compare public and private organizations, hence two different sets of governance, enhancing the heterogeneity of the results. Moreover, recent empirical studies related to technology transfer are mainly in science, engineering and technology, neglecting to enlarge the analysis also to other fields, such as arts, humanities or social sciences (Cunningham, Reilly, and Reilly 2018).

In line with these premises, focusing on arts and cultural domains, even if digital technologies profoundly affect museums' internal functioning, the majority of the literature on this topic has investigated the impacts of digital transformation on exhibitions or visitors' experience (Bertacchini and Morando 2013). Very little has yet been done in the direction of investigating organizational aspects and the related academic knowledge follows mainly three paths (Tamma et al. 2019): how museums conceive the relationship with stakeholders; how they perceive heritage and how they narrate it; how the concept of the museum itself is changed.

Therefore, the goal of this study is to contribute to the extant discussion by answering the following research question: *How does digital transformation affect the innovation process within Italian museums?* To answer this question, we first adopt as lens of analysis the theoretical framework proposed by Appio et al. (2021): according to the authors, the interconnections among digital transformation, innovation management and processes could be examined along with three main levels: the first is related to the changes occurring in the external environment (*macro*), the second concerns instead the implications on the organizational structure (*meso*) and the last one deepens the consequences of digital transformation on individuals (*micro*). The choice to use this framework was done because digital transformation is a phenomenon that involves different levels of analysis and, as Lanzolla et al. (2020) suggest, to gain deeper insights and conclusions on its implications different theoretical perspectives should be overlapped.

Results provide both theoretical and managerial insights. First, by integrating various theoretical perspectives, we observe how the digital transformation affects organizations, disentangling its path on the three different levels and highlighting the peculiarities of each of these dimensions. Second, by deepening each level, we were able to recognize the similarity and differences of digital transformation within public and private organizations.

THEORETICAL BACKGROUND

In the last decades, the spread of digital technologies has continuously created new opportunities and trials for organizations and, nowadays, the effects related to their adoption and impacts are gaining increasing attention as line of inquiry (Lanzolla et al. 2020). Nevertheless, as a recent study points out, various interpretations coexist when debating this topic (Appio et al. 2021), also due to the potential pervasiveness of digital transformation on management and organization, making it urgent to deepen the topic.

To not get lost in the vast array of available literature (see for example Appio et al., 2021; Lanzolla et al., 2020; Mergel et al., 2019; Nambisan et al., 2017; Smith & Beretta, 2021), it is useful to narrow down the research boundaries and briefly distinguish between the concepts of digital innovation and digital transformation, which are the two main

clusters identified by Appio et al. (2021) in their systematic analysis. The former could be defined as the process in which “digital technology and associated digitizing processes form an innate part of the new idea and/or its development, diffusion, or assimilation” (Nambisan et al., 2017, p. 224). The latter, instead, “is expected to bring key changes to business operations, processes and organizational structures” (Kretschmer & Khashabi, 2020, p. 86) and it could potentially “impact different stages of the innovation process” (Appio et al., 2021, p. 5).

As far as the aim of this research is to provide a unified frame of how organizations are orchestrating the integration of digital technologies within existing structures and processes, the abovementioned definition of digital transformation seems to be the most suitable to pursue our goal.

Framing the boundaries: digital transformation within museums

Traditionally, museums were primarily devoted to the aim of conserving and preserving the cultural heritage but, nowadays, the collection could not be their only *raison d'être* (Weil, 2002). This trend is confirmed also by the museum definitions given by the International Council of Museums (ICOM, 2007), which affirms that “a museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment”.

From this definition, it appears that the potential implications of digital technologies within museum boundaries could cover several areas. Indeed, as recent studies have proved (Marini and Agostino 2021; Agostino and Costantini 2021; Borowiecki and Navarrete 2017) museums have long been required to go beyond their primary role and digital technologies could affect the provision of new products and services, such as online exhibitions, the exhibition and organization of collections or the adoption of new research processes (Navarrete 2019). Furthermore, these transformations influence how value is created (Bakhshi and Throsby 2012) and the relationships between digital and material cultures (Rossi 2019).

Nevertheless, as for any other public or private organization (Kretschmer and Khashabi 2020), digital technologies are profoundly changing museums' internal functioning and management (Agostino, Arnaboldi, and Lampis 2020), creating strains and tensions within the structure and changing the ways of working (Tamma et al. 2019).

Macro, meso and micro levels: the theoretical lens of analysis

Considering the abovementioned premises, we decided to investigate the topic by adopting the framework proposed by Appio et al. (2021), according to whom the relation between digital transformation and innovation processes could be analysed along with three different levels: micro-, meso- and macro-levels.

The choice to rely on this framework was done because we believe it could be a suitable model to disentangle the phenomena at the interplay between digital transformation, strategy and innovation processes. As Figure 1 depicts, each level has its features, allowing us to consider them individually but also as components of the unified process of digital transformation. More precisely, it considers the external conditions (*macro-level*), such as the modalities in which industries are organized, inter-

organizational connections and multi-stakeholders interactions carried out, as well as the implications connected to social and political factors that might conducive, or obstruct, digital transformation.

Analogously, the model put emphasis also on the challenges on the organizational structure (*meso-level*), allowing to focus on how digital transformation might affect processes, intra-organizational routines and capabilities. Furthermore, by deepening how digital technologies impact organizational agents (*micro-level*), it allows shedding light also on the changes required in their behaviours, motivations and abilities to learn.

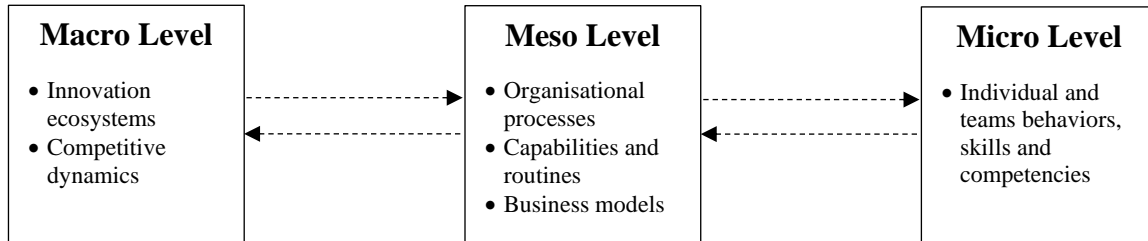


Figure 1 - Macro-, meso- and micro-levels, according to Appio et al. (2021) framework

RESEARCH METHOD

As the knowledge concerning the topic is multifaceted and still limited, it becomes crucial to gather data from those people that are experiencing the phenomenon under investigation (Gioia, Corley, and Hamilton 2013) “within their real-life context” (Yin 2013, 13). Thus, due to the phenomenon-driven (Eisenhardt and Graebner 2007) nature of the research purpose, we performed a longitudinal, multiple and exploratory case study (Yin 2013).

Case selection

This study is part of the activities carried out by the Digital Innovation in Heritage and Culture Observatory of the School of Management of Politecnico di Milano, a permanent research initiative that investigates how the Italian cultural domain can strategically implement and apply digital technologies. The focus on Italian museums is because not only the appearance of digital technologies is deeply transforming their activities (ICOM and OECD 2019) but also, in the last years, the country has faced a growing effort toward digital transformation, also from a legislative viewpoint (Agostino, Arnaboldi, and Lampis 2020).

Starting from these premises, we selected multiple cases adopting a theoretical sampling (Eisenhardt 1989; Eisenhardt and Graebner 2007) following these criteria. First, we decided to examine organizations that are similar in size and geographical area.

Second, we selected organizations that are similar in terms of the type of cultural offer but with a different form of governance, to highlight the similarities and the difference between private and public institutions. Hence, we extracted from the initial sample four cases, resumed in Table 1. The choice to conduct a longitudinal study was done because digital transformation is “a challenging journey” (Smith & Beretta, 2021, p. 167) for organizations and adopting a longitudinal perspective allowed us to generate insights on how this path is conducted.

		Case A	Case B	Case C	Case D
Organizational characteristics	Geographical Area	North-west Italy	North-west Italy	North-west Italy	North-west Italy
	Institution type	Museum	Museum	Museum	Museum
	Form of governance	Private	Public	Private	Public

Table 1 – Summary of the cases

Case A is a museum managed by a private foundation and devoted to the preservation and valorisation of ancient culture. The digital transformation project started at the beginning of 2021, aiming to implement a platform for the management of the data related both to the internal functioning of the institution and the collection.

Case B is a large public museum, which has brought together in a single institution various entities previously managed separately. The digital transformation project, implemented in January 2021, aims to enhance both the organizational functioning, by developing a dashboard integrated with the Content Management System and Customer Relationship Management, and the modalities of interactions with visitors.

Case C is a museum run by a private foundation, to promote research and divulgation activities in the field of photography and cinema. The digital transformation project started at the beginning of May 2021 to develop new channels of communication and interaction with the public and enable new technological solutions both for the implementation of new services and for internal management.

Case D is a public museum, composed of different buildings. The digital transformation project was initiated at the beginning of May 2021 to develop a technological solution able to gather data and information related to the cultural heritage and, consequently, enhance preservation and valorisation activities.

All the institutions have planned, and are implementing, capacity-building initiatives.

Data collection

To limit potential biases and gather stronger insights (Eisenhardt and Graebner 2007), we relied on multiple sources of evidence. As summarised in Table 2, we drew on primary data, namely semi-structured interviews, and secondary data, such as the executive report of each project, the related Work Breakdown Structure (WBS) and Organizational Breakdown Structure (OBS) and policy documents. Moreover, we were able to consult also administrative data, to have a complete overview of the four organizations.

Before starting with the interviews, an in-depth analysis of each executive project was conducted, to have a preliminary picture of the main features, intents of the project and also of the stakeholders involved. These data, triangulated with the theoretical framework, guided us in the writing of the interview protocol.

Primary data have been gathered through two rounds of semi-structured interviews (overall 16) with 27 different informants, conducted between July 2021 and November 2021. For all the cases, the first interview was with the project manager: the choice to consider this informant as the first contact point was due because he/she is the person in

charge to develop the digital transformation project. Hence, it appears to be the best referee to have the whole picture of the project.

We began the interviews by asking informants to briefly describe the project and summarise the reasons that guided the organization to plan such technological journey. These questions allowed us to identify the level of maturity of each project, the internal and external stakeholder involved and the enabling or obstructing factors.

Data were simultaneously collected and analysed in a cyclical process, that allowed us to gather new information based on the evidence that arose from previous interviews (Gioia et al. 2010). Therefore, the research increasingly focused on deepening the relationships of digital transformation with the macro, meso and micro levels, thanks also to the involvement of employees and technology providers as referees. The second wave of data gathering deepened on (i) the role and the management of alliances among museums and technology providers, (ii) the effects of digital transformation on the extant organizational structure and (iii) the ones on individual behaviours and competencies.

The interviews lasted at least one hour, were conducted using online tools and were recorded and transcribed verbatim. The first author cross-checked primary data with secondary sources, while the second and the third authors critically reviewed the observations to ensure the maintenance of a high-level perspective (Gioia, Corley, and Hamilton 2013). Finally, information bias was addressed in numerous ways: first, we assured anonymity to all informants (Eisenhardt 1989); then, informants with diverse responsibilities and backgrounds were involved and data have been gathered through a longitudinal approach (Ozcan and Eisenhardt 2009); lastly, the results have been inferred thanks to the triangulation of primary and secondary data (Bingham & Eisenhardt, 2011).

Case	Primary Data	# of Informants	Secondary Data
A	<ul style="list-style-type: none"> • 1 interview with the project manager • 1 interview with the technological provider • 1 interview with the employees 	5	<ul style="list-style-type: none"> • Executive project • Work Breakdown Structure • Organisational Breakdown Structure • Administrative Data
B	<ul style="list-style-type: none"> • 1 interview with the project manager • 3 interviews with the technological provider • 1 interview with the employees 	7	<ul style="list-style-type: none"> • Executive project • Work Breakdown Structure • Organisational Breakdown Structure • Administrative Data
C	<ul style="list-style-type: none"> • 1 interview with the project manager¹ • 2 interviews with the employees 	9	<ul style="list-style-type: none"> • Executive project • Work Breakdown Structure • Organisational Breakdown Structure • Administrative Data
D	<ul style="list-style-type: none"> • 1 interview with the project manager • 2 interviews with the technological provider • 2 interviews with the employees 	6	<ul style="list-style-type: none"> • Executive project • Work Breakdown Structure • Organisational Breakdown Structure • Administrative Data

Table 2 – Data sources

¹ The technological provider is also the project manager of the project.

Data analysis

Following the recommendations for multiple case study theory building, within- and cross-case analyses were performed (Eisenhardt 1989; Eisenhardt and Graebner 2007). Primary data have been individually analysed and triangulated with secondary sources (Jick 1979). Then, the first author began by coding the interviews to identify the preliminary concepts. All the researchers then moved to a cross-case analysis and cycled between case data, emerging concepts and the academic literature to refine the emerging themes, abstraction levels, construct measures and theoretical relationships (Gilbert 2005). To clarify this process of data analysis and the definition of conceptual categories (Suddaby 2006), Figure 2 depicts the outputs of this phase.

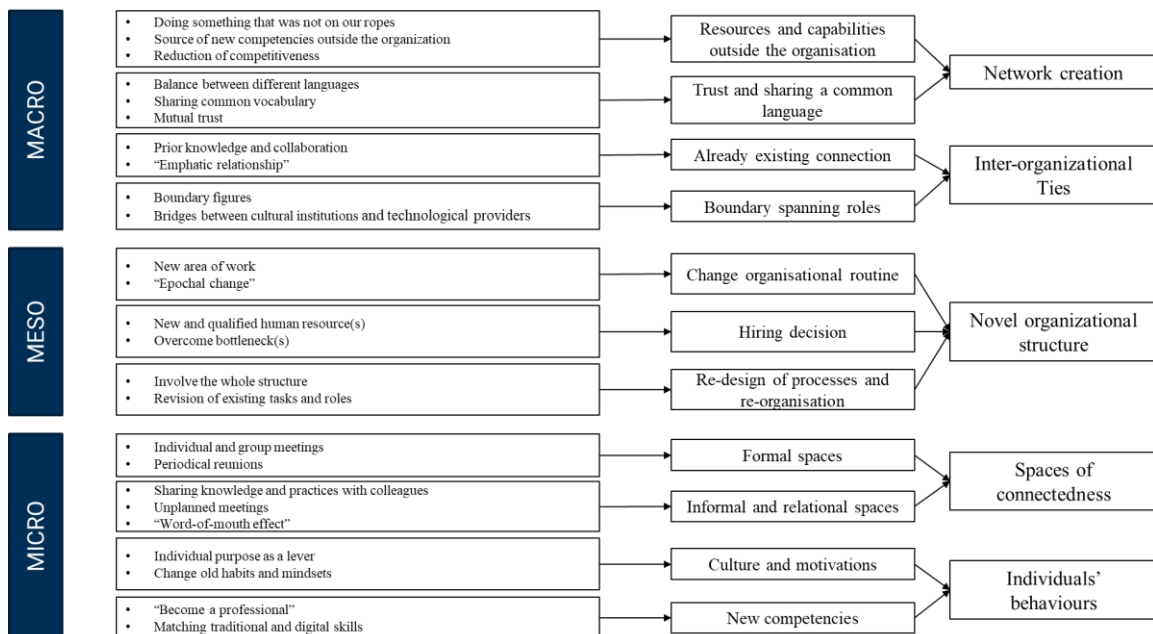


Figure 2 – Data structure

FINDINGS

Data reveals how digital transformation affects organizations on different levels. The results are reported in three main paragraphs, following the macro, meso and micro levels proposed by Appio et al. (2021). For each level, the main components are illustrated.

Macro level

Network creation

The first step underlying digital transformation within museums required the acquisition of a set of specific competencies related to digital tools, necessary to complement the ones that traditionally characterized the institutions analysed. On the one hand, museums frequently did not have these resources within their organizations, as one of the employees of Case C stated:

We do not have specific professionalism within our boundaries. We do have a computer technician, which is fantastic, but we need also someone able to manage the whole digital transformation project.

In line with this, an employee of Case D pointed out that the lack of resources is a structural hole that, at least for public museums, had its roots in the administrative configuration:

The Ministry does not contemplate everything related to the digital world: this is a huge inconvenience that, like us, several museums in Italy are facing. Nowadays, no figure with skills related to the digital ecosystems is expected, we are completely dependent on suppliers.

Hence, embracing a digital transformation project demands that museums leverage expertise outside their boundaries, creating interconnections with technological suppliers to reach their aim. In the word of a provider of Case B:

There have been reciprocal contamination, it helped. One of the main advantages of the creation of this network of relationships among different entities is that we work in a context of cooperation and sharing. We all strive to implement the project.

On the other hand, to enable this contamination and convergence among two different worldviews, museums and providers should find a common ground on which to communicate. As a matter of fact, sharing a common language is a key element for the implementation of the project, as the provider of Case A noted:

We speak our technical jargon, while they speak the language of the art: we have found all together a way to talk the same language. Here is the trick: listen and be heard.

And a provider of Case B echoed:

It was necessary to work a lot to create a common ground, a shared language. We had to define a language that, in some way, gets everyone to agree.

In addition, the informants recognized that another crucial aspect is the nature of the relationship: having trust and confidence in the counterpart is the fuel for implementing the digital transformation project. In the words of one of the providers of Case D:

Working together increases familiarity and mutual trust, which is crucial and interesting.

Overall, the analysis of the interview suggests us:

Proposition 1. Digital transformation is more likely to be undertaken if museums act not as atomistic organizations, but as actors embedded in a network with other entities, especially their technological suppliers. Indeed, the implementation of such projects entails a reduction of vertical integration and the convergence of two different worldviews - cultural and technological.

Inter-organizational ties

All the informants, both from the museum and the provider sides, pointed out the importance of network cohesion and tie intensity. Empirical evidence revealed that these elements are more strong if the connection between museums and their providers pre-existed before the beginning of the project. First, they focused on how these relations were

born and how they are supporting the implementation of digital transformation. Actually, as the project manager of Case A argued:

One of the building blocks of the project was the prior relationship that we built in the last ages with our providers: we already know them, and they know our staff and our mindset. That has made project implementation easier.

In continuity with this, the provider of Case C, which is also the project manager of the project – testifying the strong inter-connection created between the two worlds – affirmed:

We have been collaborating with them for many years. We started with a pilot project, that was rather successful. Since then, we sharply focused our collaboration, which has become increasingly strategic for both the counterparts.

And one of the providers of Case B echoed:

There is a fantastic connection with some of the people working within the museum. We know each other very well...it is not friendship, but it is at least an empathetic relationship.

Second, once the network is created and the connections among different actors are solidified, it is necessary to fill the resource gap, transferring knowledge from providers to museums. Cases showed that to effectively do so, it is fundamental to identify boundary-spanning figures, on both the technological and cultural sides, who mediate among the two parts. Regarding these aspects, the project manager of Case A stated:

Before the start of the project, we aimed to hire a new resource, which was supposed to be working as a technology mediator. She/he should possess a humanistic and artistic background, but also technical experiences. [...] Unfortunately, due to the pandemic, we were forced to stop this process, which I believe is fundamental.

Comprehensively, we thus concluded that:

Proposition 2. Divergences in worldviews are more likely to be overcome by combining two factors. On one hand, the strength of already existing inter-organizational ties creates more fluid boundaries between museums and their suppliers. On the other, the identification of boundary-spanning figures acting as mediators enable the transfer of technological knowledge.

Meso level

Novel organizational structure

Cases showed that, once the interactions between different actors are established and the network is created, it is necessary to operate within organizational boundaries, to exploit and embrace the opportunities given by digital technologies. Firstly, there was a consensus between all the informants, both in public and private museums, that digital transformation was changing their organizational routine. As reported by the project manager of Case B:

The management of a digital transformation project is for us an absolute novelty: it is really challenging and sometimes difficult. Actually, I am the project manager not only

of the whole project but also of its work packages: the delegation to other organizational agents has yet to be undertaken. We have to work on this.

And one of the employees of Case A echoed:

Think of our curators: they will experience a big change with the new database. I will not face this aspect in-depth, as I am not a curator, but I suppose that for them it will be an epochal change: the idea is to add also other apps...with them thousands of possibilities will open up.

Hence, the introduction of digital solutions required both organizational adaptability and foresight in the design of daily activities, as one of the employees of Case D summarized:

Even though I won't work here in the future, I left to the museum and colleagues not only an updated dataset, but a *modus operandi*. If someone else will implement the project, expanding it to new areas of the museum, he/she should follow this recipe. We are all working for it, it is changing our mindset, our daily routines.

These changes frequently lead to new employment areas, characterized by the demand for more technical competencies. On the one hand, the gaps in these areas should be filled through hiring policies, acquiring specialized figures from outside the organization. Indeed, as one of the employees of Case C noted:

The technological implementation required by the project needs the museum to be equipped with a proper and permanent staff figure. She/he has to represent the museum as a highly specialized interlocutor and assume the coordination, strategy development but also daily management of digital services and tools.

Nevertheless, for some of the museum interviewed, this need is still a wish for the future, as one of the employees of Case D pointed out:

Nowadays the Ministry is carrying out various actions, digitization is becoming one of the most important aspects. We hope that there will be further developments. We currently have an IT officer: he takes care of the network, checks the antivirus...the work of the computer scientist in our structure is mainly this. We do have also a technology officer who takes care of construction sites and things like this. However, we still lack someone who specializes in the digitization of heritage.

On the other hand, both hiring policies and also the difficulties of employee new people influence organizational structures and processes, leading to a re-design of the existing functions and roles. In the words of the project manager of Case B:

We do expect great benefits within organizational boundaries. Nowadays, two employees perform this task, but it is not their proper job: once the digital transformation project will be implemented, they can be assigned to activities that will reflect organizational changes and will be also more fitting and rewarding for them too.

In addition, the informants highlighted the importance to spread the organizational re-design not only within the team involved in the digital transformation project but across the whole structure. Regarding this aspect, the provider of Case C stated:

We have to think in perspective: the goal is to involve and impact resources at different levels, not only those engaged in the project but also all the other levels.

This statement pointed out the importance to make intra-organizational boundaries malleable to the digital transformation project, hence enabling a transaction from the old organizational structure to a novel one. Indeed, as the project manager of Case A noted:

At a certain point, when the structure starts growing, it is necessary to follow its development. This means not only acting on a staff level but progressively working on organizational know-how and a department level.

And the project manager of Case B echoed:

The project is forcing us to work in synergy with all the offices. One of its goals was to enhance a cross-functional collaboration among diverse divisions: this is happening. What is surprising is that is not formalized in an organogram, but these changes are however occurring in the organizational structure.

Overall, our findings suggest that:

Proposition 3. The acquisition of knowledge from outside museums is more likely to happen by balancing the integration of new capabilities from outside and the exploitation of those already present in the organization. This process could create divergences between the old and the novel structure, changing the organizational routines and leading to the definition of a transient structure designed to respond to digital transformation challenges.

Micro level

Space of connectedness

Lastly, the informants described how, in the chorus of the transformation set off at organizational level, it was crucial to work on individual level, to transfer the knowledge from the internal boundary-spanning figure to the whole personnel. The evidence gathered showed how this happened on two different levels. First, by organizing formal moments of training, as one of the employees of Case D argued:

Probably for the first time, we sat down around a table with all the other offices to manage together a project with a common purpose. This was incredibly useful.

And the project manager of Case A echoed:

The variety of the working group is crucial such as the frequency of the meetings we hold to follow the project step by step. We believe that training courses can help the whole group to become familiar with digital solutions, hence overcoming internal resistance. An overall involvement on different levels likely facilitates the training phase.

As a matter of fact, setting various formal spaces – both online and onsite – to reflect, learn and discuss the digital transformation project enabled not only the process of knowledge

transfer, but also the creation of common organizational ground. In the word of one of the employees of Case C:

Thanks to the periodical meetings with the director and the other offices, the project is progressively entering into our ordinary activities.

Second, what emerged from the interviews was that also informal relational spaces become crucial to enable the acquisition of knowledge and competencies within the organizational boundaries. Referring to this, one of the employees of Case A noted:

I personally rely on the word of mouth effect: some colleagues in the communication office have already started using Microsoft Teams, as I am also doing. They are organizing events, multidisciplinary activities, etc... They are also recommending it as a tool to colleagues from other departments who have to work with them on specific projects.

In line with the statement, one of the employees of Case D reported:

Paying attention to the various needs, questions, issues are the key: everyone knows the building from different perspectives, according to his/her work and needs. It is certainly an essential contribution to sharing expertise and knowledge.

And one of her colleagues added:

We are few but we try as much as possible to team up on these aspects: otherwise, it would not be possible to pursue the process of digitization.

Concluding, we summarized the findings as follows:

Proposition 4. Once the knowledge transfer from outside museums is triggered, this expertise should be acquired and spread within organizational boundaries. This is more likely to happen when new spaces of connectedness are created, combining institutional and informal moments to manage the innovation process.

Individual's behaviours

Finally, all the informants agreed on the importance of acting also on individual reactions in front of the digital transformation process. Indeed, the last building block of the digitization path was to understand and monitor what happened at the behavioural level. Even for this block, the data gathered showed that it was necessary to pursue, at least, two main directions: leveraging on individual motivations and culture to hence promote the acquisition of new competencies. As regards the former, one of the providers of Case B stated:

Individuals are one of the cornerstones of digital transformation. If we do not start from them, the risk is to implement technological solutions that are highly performant, but detached from the organization. This is why we have started working on individuals' mindsets and motivations, rather than enhancing only technological skills. This will be the further step.

This approach appeared to be crucial also to avoid resistance to change and stiffness that, in the words of the project manager of Case A, “are two elements on which we clash every single day”. In addition, individuals were also rewarded with professionalization opportunities and, as one of the employees of Case D noted:

For me, this project is extremely vocational. I think this is a great occasion, for the museum as a public entity but also our personal skills: I am reading several documents and taking a leaf out of other best practices to maximize this experience.

The leverage on individual motivations and non-monetary rewards set hence the ground for the development of new, T-shaped competencies. In the words of the project manager of Case B:

We have laid the foundations for the development of transversal and digital knowledge, trying also to engage the aptitude for a new way of working. At first, it was difficult and all seemed so vague but now it is getting better: there is always a positive response from colleagues.

However, cases showed that this process of development of T-shaped competencies is still rather long and complex, as sometimes the personnel “start from a basis that is little more than analogue”, as one of the employees of Case C affirmed. Nevertheless, the gradual process of matching digital, traditional and soft skills was helping, as one of the employees of Case D stated:

I am not quite a technical mind, but just listening to them, seeing what they [=the technological providers] do is helping me. The competencies that I am acquiring now are the ones that I will need in the future.

Overall, the evidence suggests us:

Proposition 5. Along with the re-design of the organizational structure, also individuals should cope with digital transformation, to reap its benefits: digital transformation is more likely to be undertaken if organizational agents are at the centre of the whole project, leveraging on personnel intrinsic motivation and combining soft and traditional skills with the digital ones.

DISCUSSION

In this study, we focused on how a particular type of organization, museums, undertake digital transformation. Through an in-depth investigation, we pointed out digital transformation peculiarities, discharging them along three main dimensions. A more fundamental contribution is a synthesis of the similarities and differences occurring in this process among public and private museums.

A path for embracing digital transformation

A primary contribution is a clarification of how public and private museums are facing digital transformation. To deepen the topic, we considered the framework proposed by Appio et al. (2021), which allowed us to unpack this process by analysing its implication on three levels: macro, meso and micro.

First, considering both the relationship of digital transformation with the ecosystem

of actors and the social, economic and competitive environment (*macro-level*), the referees interviewed focused on the fact that digital transformation required the acquisition of a set of key resources – *i.e.* competencies and technological products – which, nowadays, museums do not have within their boundaries. Hence, the search for these resources should be extended beyond museums' boundaries, thanks to the development of strategic networks (Gulati, Nohria, and Zaheer 2000) to complement the resources existing within the cultural field (Proposition 1).

Nevertheless, in the past ages museums and technology providers have been frequently seen as two opposite poles. As a matter of fact, it is likely that even in the future museums will rely on providers for the supply of technological products, but they are called to gradually internalize technological skills. To reach this aim, our cases showed how it is crucial to make the two counterparts communicate and cooperate for the functioning of the network structure. On the one side, if museums leverage the expertise of already known providers, the process of transferring their competencies within museums' boundaries appeared to be easy. Indeed, the strength of already existing ties and prior relationships enables to overcome worldviews divergences (Reagans and McEvily 2010). On the other side, due to the intrinsic differences between these two industries, the latter aspect appeared not to be enough: data showed how it is necessary to identify figures with boundary-spanning roles, to mediate their interests and practices with the ones of their counterparts (Slavova and Metiu 2022) and to frame the knowledge in a language familiar to the final recipient (Reagans and McEvily 2010) (Proposition 2).

As regards the impacts of digital transformation on organizational structure, design, capabilities and processes (*meso-level*), the primary evidence is that the acquisition of knowledge from outside into museums occurs more easily if museums undertake a process of integration of new and external roles along with the exploitation of the competencies already existent within their boundaries. This brings to a redefinition not also of everyday activities for the employees involved but also, and more broadly, to the arising of a transient organizational structure (Smith and Beretta 2021), which is a hybrid among the old, formal one and a novel, informal organizational structure (Proposition 3).

Moving then to the micro-foundations affecting individuals' and teams' behaviours (*micro-level*), once the technological competencies have crossed museums' boundaries, they should be spread within the organization. Hence, the boundary-spanning figure of the museum should share the knowledge he/she acquired with his/her colleagues within the organization. This element is crucial because, as previous literature pointed out, "knowledge is more likely to be transferred between people with similar training and background characteristics" (Reagans & McEvily, 2010, p. 243). To pursue this goal, it is however necessary to create spaces where people could exchange information. For this reason, on the one hand it is necessary that project managers – and the museum's board – established formal and periodical spaces of training to engage the whole organization in digital transformation, such as workshops and meetings. On the other hand, the informal and relational moments of discussion that arose from the daily routine become spaces where organizational agents shared beliefs, concerns and best practices (Slavova and Metiu 2022) related to the digital activities (Proposition 4).

Finally, to pursue digital transformation it is necessary to understand how individuals respond to it. The projects implemented in the four museums analysed show how it is crucial to closely link digital transformation with the agents working within the

organization, deepening their fears, inclinations and abilities. As a matter of fact, the data pointed out how these projects are “relational”, as the actions they initiate or restrict are also dependent upon the individuals who use them in their work (Bailey et al., 2022, p. 3).

Hence, the contribution of each organizational agent is needed to achieve digital transformation (Kretschmer and Khashabi 2020): working on employee’s subjective motivations and perceptions of the new activities is a key driver to enhance both the development of a coherent path of digital transformation and, consequently, the growth of T-shaped competencies within museums’ boundaries (Proposition 5).

Theoretical and managerial implications

To sum up, this study provides different theoretical contributions. First, by adopting diverse theoretical perspectives, we disentangle how the four cases analysed undertake digital transformation. Therefore, it is a step in the direction indicated by Lanzolla et al. (2020) concerning the necessity to integrate different theoretical viewpoints to investigate the nature of the phenomenon.

Moreover, the research provides evidence that could be considered on two parallel levels: on the one hand, considering the theoretical framework adopted for the analysis (Appio et al., 2021), digital transformation could be seen as a univocal path that has to jointly involve three main dimensions (macro-, meso- and micro-level). On the other hand, the study deeply analyses each level, shedding light on the intrinsic peculiarities of the three dimensions.

In addition, we unpacked digital transformation within both public and private museums. Surprisingly, there are a few differences related to the diverse mechanisms of governance of these organizations: as a matter of fact, the evidence shows how digital transformation for public and private museums is rather the same when considering the macro and micro levels. The variance emerges when considering instead the meso-level: when working on the organizational structure, public museums have to deal with exogenous factors – such as the work policies and the directive of the Italian Ministero della Cultura – that are more likely to limit the capabilities to adapt the organizational structures according to the changes required by digital transformation.

This evidence has important consequences both for museums’ practitioners and policymakers. As concerns the former, the analysis we performed provides a new lens for understanding digital transformation within a specific domain, the cultural one, and what actions to orchestrate to embrace it. The results point out how project managers and the museums’ boards ought to consider digital transformation as both a unified path and in its three inherent and interrelated levels. Indeed, the peculiarities found in each level are likely to influence the other two levels and, if not considered in a general route, they might obstruct the whole process of digital transformation.

On the latter point, our evidence has also policy implications: on the one hand, we highlight the need, and the urgency, to revise the extant work policies and organogram for public museums, which are now almost dated and not ready to take on the digital transformation challenges that the whole society is facing. Also in this case, by considering digital transformation as a path composed of three interconnected levels, it might be possible for policymakers to isolate better the problems and act to enhance a more efficient transformation.

Boundary conditions and future research avenues

In this research we investigate how Italian museums are facing digital transformation, by discerning the levels involved in this path and the peculiarities of each phase. The triangulation of the data with the extant academic literature allows claiming the generalizability of the results within museums. However, even if the decision to examine the Italian context derives from the high presence of museums in the country and guarantee a generalizability of the evidence, this scenario is different from the one of other States, which might differ in the management of museum institutions. Further research can enlarge the view by comparing our findings with other countries and including an analysis of other types of cultural institutions, like for instance theatres.

Furthermore, this study focuses on data collected at the beginning of the digital transformation path, leading to the rise of new opportunities and challenges. Future research may start from the evidence we presented to verify the validity overtime of the model and to enrich it with novel insight that might emerge thanks to a more mature diffusion of digital transformation within the empirical context analysed.

Finally, considering the relationships among the public and private museums, even though the Italian Ministerial Decree 23/12/2014 compares State museums to any other public body, some of the findings may not be extended to other public areas. Future studies may thus endeavour to explore the peculiarities of digital transformation in other public and private domains.

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REFERENCES

- Agostino, Deborah, Michela Arnaboldi, and Antonio Lampis. 2020. "Italian State Museums during the COVID-19 Crisis: From Onsite Closure to Online Openness." *Museum Management and Curatorship*, 362–72. <https://doi.org/10.1080/09647775.2020.1790029>.
- Agostino, Deborah, and Chiara Costantini. 2021. "A Measurement Framework for Assessing the Digital Transformation of Cultural Institutions: The Italian Case." *Meditari Accountancy Research*. <https://doi.org/10.1108/MEDAR-02-2021-1207>.
- Appio, Francesco Paolo, Federico Frattini, Antonio Messeni Petruzzelli, and Paolo Neirotti. 2021. "Digital Transformation and Innovation Management: A Synthesis of Existing Research and an Agenda for Future Studies." *Journal of Product Innovation Management* 38 (1): 4–20. <https://doi.org/10.1111/jpim.12562>.
- Bailey, Diane E., Samer Faraj, Pamela J. Hinds, Paul M. Leonardi, and Georg von Krogh. 2022. "We Are All Theorists of Technology Now: A Relational Perspective on Emerging Technology and Organizing." *Organization Science* 33 (1): 1–18. <https://doi.org/10.1287/ORSC.2021.1562>.
- Bakhshi, Hasan, and David Throsby. 2012. "New Technologies in Cultural Institutions: Theory, Evidence and Policy Implications." *International Journal of Cultural Policy* 18 (2): 205–22. <https://doi.org/10.1080/10286632.2011.587878>.
- Barley, Stephen R, and Gideon Kunda. 2001. "Bringing Work Back In." *Organization Science* 12 (November 2021): 76–95. <https://doi.org/10.1287/orsc.12.1.76.10122%0AFull>.
- Bertacchini, Enrico, and Federico Morando. 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.

- Bingham, Christopher, and Kathleen Eisenhardt. 2011. “Rational Heuristics: The ‘simple Rules’ That Strategists Learn from Process Experience.” *Strategic Management Journal* 1464 (January 2009): 1–43. <https://doi.org/10.1002/smj>.
- Bonanomi, Marcella M., Daniel M. Hall, Sheryl Staub-French, Aubrey Tucker, and Cinzia Maria Luisa Talamo. 2020. “The Impact of Digital Transformation on Formal and Informal Organizational Structures of Large Architecture and Engineering Firms.” *Engineering, Construction and Architectural Management* 27 (4): 872–92. <https://doi.org/10.1108/ECAM-03-2019-0119>.
- Borowiecki, Karol J., and Trilce Navarrete. 2017. “Digitization of Heritage Collections as Indicator of Innovation.” *Economics of Innovation and New Technology* 26 (3): 227–46. <https://doi.org/10.1080/10438599.2016.1164488>.
- Cunningham, James A, Paul O Reilly, and Paul O Reilly. 2018. “Macro , Meso and Micro Perspectives of Technology Transfer.” *The Journal of Technology Transfer* 43 (3): 545–57. <https://doi.org/10.1007/s10961-018-9658-4>.
- Eisenhardt, Kathleen M. 1989. “Building Theories from Case Study Research.” *Academy of Management Review* 14 (4): 532–50. <https://doi.org/10.5465/amr.1989.4308385>.
- Eisenhardt, Kathleen M., and Melissa E. Graebner. 2007. “Theory Building from Cases: Opportunities and Challenges.” *Academy of Management Journal* 50 (1): 25–32. <https://doi.org/10.5465/AMJ.2007.24160888>.
- Gilbert, Clark G. 2005. “Unbundling the Structure of Inertia: Resource versus Routine Rigidity.” *Academy of Management Journal* 48 (5): 741–63. <https://doi.org/10.5465/AMJ.2005.18803920>.
- Gioia, Dennis A., Kevin G. Corley, and Aimee L. Hamilton. 2013. “Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology.” *Organizational Research Methods* 16 (1): 15–31. <https://doi.org/10.1177/1094428112452151>.
- Gioia, Dennis A., Kristin N. Price, Aimee L. Hamilton, and James B. Thomas. 2010. “Forging an Identity: An Insider-Outsider Study of Processes Involved in the Formation of Organizational Identity.” *Administrative Science Quarterly* 55 (1): 1–46. <https://doi.org/10.2189/asqu.2010.55.1.1>.
- Gulati, Ranjay, Nitin Nohria, and Akbar Zaheer. 2000. “Strategic Networks.” *Strategic Management Journal* 21 (3): 203–15. [https://doi.org/https://doi.org/10.1002/\(SICI\)1097-0266\(200003\)21:3<203::AID-SMJ102>3.0.CO;2-K](https://doi.org/https://doi.org/10.1002/(SICI)1097-0266(200003)21:3<203::AID-SMJ102>3.0.CO;2-K).
- Jick, Todd D. 1979. “Mixing Qualitative and Quantitative Methods: Triangulation in Action.” *Administrative Science Quarterly*.
- Kretschmer, Tobias, and Pooyan Khashabi. 2020. “Digital Transformation and Organization Design: An Integrated Approach.” *California Management Review* 62 (4): 86–104. <https://doi.org/10.1177/0008125620940296>.
- Lanzolla, Gianvito, Annika Lorenz, Ella Miron-Spektor, Melissa Schilling, Giulia Solinas, and Christopher L. Tucci. 2020. “Digital Transformation: What Is New If Anything? Emerging Patterns and Management Research.” *Academy of Management Discoveries* 6 (3): 341–50. <https://doi.org/10.5465/amd.2020.0144>.
- Marini, Camilla, and Deborah Agostino. 2021. “Humanized Museums? How Digital Technologies Become Relational Tools.” *Museum Management and Curatorship* 0 (0): 1–18. <https://doi.org/10.1080/09647775.2021.1969677>.
- Mergel, Ines, Noella Edelmann, and Nathalie Haug. 2019. “Defining Digital Transformation: Results from Expert Interviews.” *Government Information Quarterly* 36 (4): 101385. <https://doi.org/10.1016/j.giq.2019.06.002>.
- Nambisan, Satish, Kalle Lyytinen, Ann Majchrzak, and Michael Song. 2017. “Digital Innovation Management: Reinventing Innovation Management Research in a Digital World.” *MIS Quarterly: Management Information Systems* 41 (1): 223–38.

- <https://doi.org/10.25300/MISQ/2017/411.03>.
- Navarrete, Trilce. 2019. "Digital Heritage Tourism: Innovations in Museums." *World Leisure Journal* 61 (3): 200–214. <https://doi.org/10.1080/16078055.2019.1639920>.
- OECD/ICOM. 2019. "A Guide for Local Governments, Communities and Museums." *Culture and Local Development: Maximising the Impact*. <https://icom.museum/en/news/the-final-version-of-the-icom-oecd-guide-for-local-governments-communities-and-museums-is-now-available-online-and-will-be-presented-in-kyoto/>.
- Ozcan, Pinar, and Kathleen Eisenhardt. 2009. "Origin of Alliance Portfolios: Entrepreneurs, Network Strategies, and Firm Performance." *Academy of Management Journal* 52 (2): 246–79. <https://doi.org/10.5465/AMJ.2009.37308021>.
- Reagans, Ray, and Bill McEvily. 2010. "Network Structure and Knowledge Transfer: The Effects of Cohesion and Range." *Administrative Science Quarterly* 48 (2): 240–67.
- Rossi, Corinna. 2019. "Aristotle's Mirror: Combining Digital and Material Culture." *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences* 42 (2/W11): 1025–29. <https://doi.org/10.5194/isprs-Archives-XLII-2-W11-1025-2019>.
- Slavova, Mira, and Anca Metiu. 2022. "Relational Work and the Knowledge Transfer Process: Rituals in Rural Ghana." *Organization Science* 33 (1): 332–52. <https://doi.org/10.1287/ORSC.2021.1441>.
- Smith, Pernille, and Michela Beretta. 2021. "The Gordian Knot of Practicing Digital Transformation: Coping with Emergent Paradoxes in Ambidextrous Organizing Structures*." *Journal of Product Innovation Management* 38 (1): 166–91. <https://doi.org/10.1111/jpim.12548>.
- Suddaby, Roy. 2006. "From the Editors: What Grounded Theory Is Not." *Academy of Management Journal* 49 (4): 633–42. <https://doi.org/10.5465/AMJ.2006.22083020>.
- Tamma, Michele, Stefania Zardini Lacedelli, and Silvia Maria Carolo. 2019. "Digital Platforms 'Without a Cause': Why the Impact on a Museum Organization Should Not Be Taken for Granted. The Case Study of Civic Museums in Treviso." *SSRN Electronic Journal*, no. December. <https://doi.org/10.2139/ssrn.3498518>.
- Yin, Robert K. 2013. *Applications of Case Study Research*. Edited by Thousand Oaks. Third. Vol. 5.