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Digital Heritage and Territorial Attractiveness in Morocco: From Cultural Innovation to Sustainable Tourism

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Abstract

The digital transformation of museums has emerged as a strategic priority for cultural institutions seeking to preserve heritage while enhancing visitor experiences and strengthening territorial competitiveness. Despite the rapid growth of research in this field, existing studies remain fragmented, with organizational, technological, behavioural, and territorial dimensions often examined independently. This article presents a systematic literature review aimed at synthesizing the current state of knowledge on museum digital transformation and its contribution to cultural innovation and sustainable territorial development, with particular attention to the Moroccan context. Following the PRISMA 2020 guidelines, relevant publications were identified, screened, and critically analysed to examine the relationships between museum digitalization, organizational capabilities, perceived constraints, visitor experience, visitor satisfaction, cultural engagement, behavioural intention, digital heritage, territorial attractiveness, and territorial development. The findings demonstrate that successful digital transformation extends beyond the adoption of digital technologies and depends largely on organizational readiness, strategic leadership, governance, innovation capabilities, and human competencies. The review also highlights that immersive and

interactive digital technologies significantly enhance visitor experience, increase satisfaction, strengthen cultural engagement, and foster positive behavioural intentions such as revisit intention, recommendation, and loyalty. Furthermore, digital heritage is increasingly recognized as a strategic resource capable of improving destination attractiveness, supporting cultural tourism, reinforcing territorial identity, and contributing to sustainable regional development. Nevertheless, important research gaps remain, particularly regarding the integration of organizational, behavioural, and territorial perspectives within a single analytical framework and the limited empirical evidence available from African countries, including Morocco. By consolidating fragmented knowledge across multiple disciplines, this review contributes to a more comprehensive understanding of digital museum transformation and identifies promising directions for future research in cultural heritage management, museum innovation, and sustainable tourism.

Keywords: Digital transformation; Museums; Digital heritage; Visitor experience; Territorial attractiveness; Sustainable territorial development.

1. Introduction

Over the past twenty years, digital transformation has emerged as a key driving force behind the modernisation of cultural institutions worldwide. Rapid digital advances, alongside changing visitor experiences and the emergence of new knowledge-based economies, have fundamentally altered the traditional roles of museums. These institutions, which once functioned primarily as spaces for the preservation, study and dissemination of cultural heritage, have, over time, evolved into more dynamic organisations that embrace digital technologies in the areas of collection management, cultural mediation, communication with the public and the design of new and varied visitor experiences. Parry (2013) argued that digitisation constitutes the starting point for such an evolution, whilst Vial (2019) suggested that, beyond this, a genuine digital transformation involves a complete overhaul of organisational processes, resources and the value creation system. Verhoef et al. (2021) articulated a similar perspective by defining digital transformation as a comprehensive strategic organisational change that impacts technologies, business models, people and stakeholder relationships.

In the context of museums, digital transformation has become a reality thanks to the widespread availability of AI, VR, AR, digital platforms and other immersive collaborative technologies. Bekele et al. (2018) argued that these advances increase visitor interactivity with cultural heritage collections, whilst Trunfio and Campana (2020) asserted that these developments are opening up ever-greater opportunities for personalising visits and designing more immersive cultural experiences. Tham, Liu and Loo (2025) suggested that, based on a review of nearly 200 research articles, the literature on digital innovation in museums is growing at an unprecedented rate but remains fragmented in terms of theory and methodology.

An excellent example of this development has been demonstrated in the field of research devoted to digital heritage. With the adoption of the UNESCO Charter on the Preservation of Digital Heritage in 2003, cultural institutions have integrated digital technology to preserve, disseminate and promote cultural heritage. Cameron and Kenderdine (2007) and Economou (2016) emphasise that, unlike the digital heritage of the past, which focused on the virtual reproduction of cultural works, today's digital heritage has transformed cultural mediation, access to collections, and the relationships between museums and their audiences. From this perspective, Yang, Wook and Rosdi (2025) explain that digital museums have evolved into genuine knowledge-sharing systems where digital technologies support the preservation of

collections and incorporate educational and participatory frameworks.

This international trend is particularly relevant to the case of Morocco. Following the creation of the National Museums Foundation (FNM) in 2011, various projects have been implemented to modernise museums, enhance the international visibility of Morocco's cultural heritage and provide better access to it. The FNM has developed virtual museum tours and marketing tools, and launched several digital platforms to promote national collections. These initiatives aim to democratise culture and increase the number of digital and virtual cultural offerings in order to enhance the appeal of Moroccan museums.

Research findings from Morocco reinforce this trend. Nabil and Moutaoukil (2024) argue that the COVID-19 pandemic has further catalysed the digitisation of Moroccan museums by forcing many museum systems to create virtual tours, digital audio guides and interactive tablets, and to improve user engagement on social media. The authors note that there is considerable variation within these efforts, and that many museum organisations face challenges relating to funding, digital literacy and the management of digital transformation.

Selkani (2021) adopts a similar approach by examining the creation of the Virtual Museum of the National Museum Foundation in Rabat. In this study, the author demonstrates that the application of digital technology is a boon to the project of extending Morocco's cultural heritage to national and international audiences. However, the author emphasises that the creation of smart museums remains a lofty endeavour and that the application of digital technologies must be complemented by effective management and the continuous integration of technological innovations into the day-to-day activities of cultural institutions.

Beyond museums, several Moroccan authors examine the role of digitisation in cultural tourism and regional development. Ez-zahrany, Elmadhi and Mokhari (2024) argue that new digital technologies enhance appreciation of Morocco's cultural heritage, improve the visitor experience and raise the international profile of Morocco's cultural destinations. From a different perspective, Fouinna and El Ouazzani (2025) consider that the digitisation of cultural heritage is a valuable tool for cultural diplomacy that can have a positive impact on Morocco's international reputation, although they assert that current efforts lack sufficient coordination at the national level.

International literature shows that, even with all these advances, the success of digital transformation does not depend solely on the use of technology. Barney (1991) identifies competitive advantage as the key element on which an organisation must focus, whilst Teece, Pisano and Shuen (1997) describe an organisation's capacity to continually modify and renew its capabilities. In the museum sector literature, Bellio, Casarin and Nuccio (2022) argue that, in the context of digital transformation, success depends more on organisational aspects, digital governance and the skills of professionals than on the technology itself.

Furthermore, the visitor experience has also been shown to be influenced by the use of digital technologies. Contrary to the traditional view, where value was associated with goods, Pine and Gilmore (1999) refer to the 'experience economy' as the reality in which organisations create value through the experiences they offer. Falk and Dierking (2016) applied this theory to the museum context, proposing that the museum experience results from a combination of the visitor's individual attributes, the social environment, and the museum's physical and/or virtual environment. More recently, Bec et al. (2024) argued that digital technologies actually have the potential to increase visitor engagement and have a positive impact on the construction of cultural memory, thereby leading to greater involvement, satisfaction and influencing visitors' intentions to return.

Although the number of scientific publications has increased, research has remained fragmented. Typically, studies on organisational capabilities and visitor experiences are conducted separately, and studies on territorial development generally do not examine the organisational frameworks that underpin the value-building activities of digital museums. The fragmentation described is even more evident in the Moroccan context, where research is mainly descriptive and focuses on isolated initiatives. There is little interest in the overall relationship between digital organisational innovations, cultural experiences and territorial attractiveness.

This is why this article aims to provide an overview of the literature on the digital transformation of museums in Morocco and the rest of the world. The aim is to bring together the key elements of the existing literature on organisational capabilities, constraints and the digital transformation of museums, and to integrate visitor experience, satisfaction, engagement and behavioural intentions, as well as territorial attractiveness and development. The ultimate objective is to construct a framework that maps out how digital technologies enhance the operational capacity of museums and contribute to the integrated cultural and regional development of an area.

2. Review Methodology

This study employs a Systematic Literature Review (SLR) to critically analyse the implications of the digital transformation of museums at the organisational, experiential and regional levels. This method has been widely accepted in the fields of management, tourism management and heritage studies, as it reduces publication selection bias and enhances the clarity and reproducibility of the research process. According to Tranfield, Denyer and Smart (2003), the systematic review method is well-suited to addressing the challenges posed by a rapidly growing body of research, whilst the approach outlined by Kitchenham and Charters (2007) highlights the opportunities this method offers for identifying scientific research, trends, theoretical convergence and gaps in the literature. More recently, Page et al. (2021) consolidated this method with the PRISMA 2020 guidelines, which are now the international standard for conducting systematic reviews.

The literature search was conducted across several international scientific databases to ensure a high degree of comprehensiveness in the review of the existing literature. The main databases used include Scopus, Web of Science, ScienceDirect, SpringerLink, Taylor & Francis Online, Emerald Insight, Wiley Online Library, and—primarily to identify recent publications, book chapters and academic works that are not readily accessible in traditional bibliographic databases—Google Scholar. According to Mongeon and Paul-Hus (2016), conducting an integrated search across multiple databases increases the comprehensiveness of the publications identified, particularly in interdisciplinary fields such as cultural heritage, digital transformation and tourism.

The key concepts underpinning this research formed the core of the search strategy. Search queries included combinations of keywords in English and French: digital heritage, museum digitisation, digital transformation, smart museum, visitor experience, visitor satisfaction, cultural engagement, behavioural intention, regional attractiveness, regional development, cultural tourism, heritage management, digital museums, Morocco. Boolean operators (AND, OR, NOT) were applied to refine the search results as required. This strategy is in line with the recommendations of Snyder (2019) and Paul and Criado (2020) regarding literature reviews in the field of scientific management.

Selection criteria were established to avoid any selection bias. Only articles published in peer-reviewed journals, major academic books, and certain relevant institutional reports were included. These articles had to focus on at least one of the nine dimensions of this review: organisational capabilities,

perceived constraints, museum digitisation, visitor experience, visitor satisfaction, cultural engagement, behavioural intention, regional attractiveness, and regional development. The analysis excluded unpublished conference papers, technical reports lacking a scientific basis, and purely descriptive articles without theoretical framework value.

Particular attention has been paid to the most recent sources. The publications used date mainly from 2020 to 2025. This period has been marked by an increase in studies on digital museums following the COVID-19 pandemic, which has profoundly altered methods of cultural mediation. There are also a few older publications, considered important from a fundamental perspective. These include Barney's (1991) work on Resource-Based View (RBV), the dynamic capabilities framework by Teece, Pisano and Shuen (1997), the experience economy by Pine and Gilmore (1999), Kotler's (1997) concept of satisfaction, and the museum experience by Falk and Dierking (2016). Even after more than 20 years, these publications continue to serve as the foundation for many contemporary studies.

The qualitative evaluation of these studies went beyond a mere descriptive synthesis. Following Torracco's (2016) advice, the published works were compared in order to identify the convergences, divergences and controversies that currently characterise this field of study. Emphasis was placed on the relationships between the various factors studied and the conceptual frameworks underpinning the authors' reasoning. This approach enables the articulation of a theory of the relationships between digital transformation, organisational innovation, visitor experience and the integration of spatial planning, in order to move beyond a mere compilation of empirical results and grasp the interrelationships.

This review also pays particular attention to research focusing on Morocco. Whilst the international body of work on digital museums is now substantial, studies specifically concerning Moroccan museums remain few in number. These include the work of Selkani (2021), Nabil and Moutaoukil (2024), and Ez-zahrany et al.

Despite their limitations, these studies—one of which was published in a Moroccan academic journal (2024)—help to shed light on certain aspects relating to digitisation, cultural heritage and regional development in Morocco. The distinctive feature of this review lies in its integration of international and Moroccan sources, enabling global theories to be linked to the Moroccan context and practical conditions on the ground.

3. Museum Digital Transformation: Organisational and Technological Foundations

Today, the digital transformation of museums is more than just a strategic shift; it demonstrates how new technologies can advance business strategy and operations. In the past, researchers described digitisation as the conversion of collections into digital formats. Today, researchers describe digitisation as the integration of new technologies to radically transform organisational structures, administrative processes, the professional workforce and the relationship with audiences. Parry was among the first researchers to describe the difference between digitisation and digital transformation. Vial describes digital transformation as the complete restructuring of organisations resulting from the influence of digital technologies. Verhoef et al. describe digital transformation as the interaction between technologies, organisational structures, human capital and value-creation strategies.

This transformation is particularly evident in cultural organisations. Trunfio and Campana describe how museums have evolved from a focus on conservation to the creation of digital experiences. They now view technology as a means of engaging visitors rather than as a technical innovation. Bellio, Casarin and Nuccio describe governance, organisational flexibility and a decisive ability to shift focus as key factors influencing the success of a museum's digital initiative. Conversely, Nikolaou describes the practice of purchasing digital technologies as a strategy that leads to poor results and a lack of genuine organisational change. This practice reflects a major shift in the museological paradigm of engagement. Technology is no longer regarded as a museum's primary objective, but as a strategic tool for improving museum performance, visitor engagement and community outreach.

3.1. Museum Digitalisation: From Collection Digitisation to Digital Transformation

The last two decades have seen substantial progress in the theories and practices surrounding museum digitalisation. Early studies and reports on digitalisation focused on the processes and systems enabling the public to access information and records relating to collections. Parry (2013) argues that, in the early days of this practice, the main objective was access to collections and documentary preservation. However, this perspective now seems largely outdated. According to Vial (2019), digital transformation goes beyond the mere implementation of one or more technologies. It involves a strategic, systemic reorganisation of an organisation and the ways in which it structures and systematises value creation. Verhoef et al. (2021) confirm this

perspective by defining digital transformation as a complex system of interrelationships comprising, beyond technologies, organisational processes, human capital and stakeholder relationships.

Applying this logic of transformation to the context of museums implies a shift from a collection-centred approach to a visitor-centred one. From the perspective of collection conservation, traditional museums have transformed their approach to facilitate ongoing interaction with visitors. Trunfio and Campana (2020) explain that this shift alters the function of museums, transforming them from spaces for exhibiting artefacts and objects into platforms for the co-creation of cultural value. Similarly, Bec, Moyle and Timms (2024) argue that the use of immersive technologies enhances visitors' emotional engagement and the quality of their cultural learning. These authors also advocate the use of digital technologies to strengthen engagement and personalise the visitor experience.

The literature identifies the diversification of museum technologies as a key focus. Early examples of such technologies included digital catalogues and basic virtual tours. Today, cultural institutions employ a wide range of technologies. These include artificial intelligence, virtual reality (VR), augmented reality (AR) and mixed reality (MR), digital twins, the Internet of Things (IoT), cloud computing, mobile technologies and applications, geolocation, collaboration tools and Big Data. According to Bekele et al. (2018), the use of these tools and technologies is transforming the interactive nature of exhibitions and helping users to better understand heritage. Styliani et al. (2009) recognised that the use of virtual environments and technologies promotes the accessibility of museum collections, and Economou (2016) asserts that the use of digital technologies facilitates cultural mediation and encourages the development of different narratives around collections and museum histories.

Several researchers emphasise that the use of these technologies benefits from the development of an integrated and coherent organisational strategy. According to Bellio, Casarin and Nuccio (2022), many museums use digital tools and technologies but do not transform their organisational management strategies, which limits the benefits of this digital investment. Nikolaou (2024) notes that organisations relying solely on a technological perspective struggle to sustain their digital initiatives in the long term. By contrast, a museum that adopts a broader digital transformation strategy achieves higher levels of innovation, greater visitor satisfaction and better organisational performance. These findings suggest that, whilst technological investment is essential, it cannot be

the sole factor in the success of digital strategies within a museum context.

The onset of COVID-19 altered the course of development for many systems. The majority of museums offered online services to their visitors and audiences, thereby accelerating the evolution of digital technologies across all cultural systems. More than half of the world's museums provided digital services, virtual tours, interactive exhibitions, as well as online lectures and educational materials. UNESCO (2021) notes that the evolution of digital services within cultural institutions during and after the COVID-19 pandemic has established these services as an integral part of their operations. Some researchers argue that the COVID-19 pandemic has accelerated a transformation that, in other contexts, would have taken years (Agostino and Arnaboldi, 2021; Tregua et al., 2023). ICOM (2021) has also reported that the digital resources and services of museums worldwide have diversified during and after the pandemic.

This development is particularly evident in studies of so-called 'smart' museums. According to Carrozzino and Bergamasco (2010), a smart museum is characterised by the integration of digital resources and technologies into all its activities, including the enhancement and conservation of collections, resource management, the enrichment of the visitor experience and the dissemination of knowledge.

More recently, Yang et al. (2025) argued that smart museums are characterised by a high degree of integration between artificial intelligence, data analytics, immersive technologies and active visitor participation. However, the authors note that there is still a strong emphasis on the technological aspects of research into smart museums, whilst organisational and strategic aspects are given less prominence.

The digitalisation of museums in developing regions highlights unique factors. As the literature points out, there are unequal gaps in digital infrastructure and a shortage of skilled staff, which constitute barriers to transformation processes, alongside limited funding. In countries of the Global South, as noted by UNESCO (2023), digital strategies incorporating less costly and more resource-efficient forms of technology are being implemented. This is particularly relevant given the greater needs of African cultural institutions, such as heritage preservation, making collections accessible and the development of heritage tourism.

Morocco is a prime example of this situation. Following the establishment of the Moroccan National Museums Foundation, a number of museums have begun to modernise their digital infrastructure. This modernisation effort is

reflected in the integration of virtual tours, mobile apps, interactive multimedia and platforms for showcasing digital collections. According to Selkani (2021), the creation of the Virtual Museum by the Moroccan National Museums Foundation marked an important step towards making Morocco's cultural heritage more accessible. Nabil and Moutaoukil (2024) noted that several Moroccan museums have incorporated the use of social media, virtual tours and digital tools as components of cultural outreach. As the authors point out, the main problem lies in the disparity in levels of digital maturity, with most initiatives being uncoordinated at national level, rather than forming part of a multi-sectoral digital transformation strategy.

Wider studies on Morocco demonstrate how digitisation can enhance Morocco's cultural heritage. Ez-zahrany, Elmadhi and Mokhari (2024) state that, in Morocco, digitisation can preserve, disseminate and promote cultural heritage by building a digitised cultural heritage. According to Fouinna and El Ouazzani (2025), digitisation fosters cultural diplomacy and a positive image of Morocco. They all note that the digitisation of national cultural institutions requires more coherent national cultural governance, as well as financial and time investments.

The literature review indicates a consensus that the digitisation of museums means more than simply adopting new technologies. It involves a complete restructuring of the institution. Parry (2013), Vial (2019), Verhoef et al. (2021), Bellio et al. (2022) and Nikolaou (2024) all support this idea. The consensus is that the institution must be reorganised, but views diverge on several points. For example, some authors advocate for the overall organisation of the institution (Teece et al., 1997; Warner & Wäger, 2019), whilst others advocate the use of new technologies (Bekele et al., 2018) as well as an enhanced visitor experience (Trunfio & Campana, 2020) or public policies for heritage (UNESCO, 2023) accompanied by improved services and options that promote heritage. These differences indicate that the digital transformation of museums is a complex phenomenon involving numerous factors. This leads to the hypothesis that, in this chapter, the focus will be on the importance of organisation and overall structure (i.e. core organisational capabilities) for the successful implementation of museum digitalisation.

3.2. Organisational Capabilities: A Fundamental Driver of Museum Digital Transformation

Digital technology is an essential component of a museum's modernisation. However, some recent studies suggest that technology alone cannot provide an adequate assessment of a museum's successful digitalisation. Current literature

converges on the theory that the main factor in the success of digitalisation is the capacity of the organisation hosting the cultural project. Compared with more traditional studies, which focused more on the technological infrastructure, these are contextually more holistic. Researchers argue that, in addition to technological capacity, there is managerial capacity, governance and strategic capacity, as well as the organisation's workforce (Warner Wäger, 2019; Verhoef et al., 2021; Kraus et al., 2022).

The basis of this theory is the Resource-Based View (RBV) proposed by Barney (1991). In this framework, rare and valuable resources that can be maintained and utilised strategically—provided they are not easily replicable—confer a sustainable competitive advantage upon an organisation. Although the theory was originally developed in the competitive context of private enterprises, it has since been adapted to suit the public sector and cultural institutions. In the context of a museum, strategic resources extend beyond the heritage collection and digital platforms. They also include the skills of professionals, the organisation's knowledge and networks, its reputation and governance, as well as the ability of teams to integrate innovations into their day-to-day work. According to Bertacchini and Morando (2013), intangible resources are also becoming increasingly important in differentiating cultural institutions.

However, several authors argue that possessing strategic resources alone is not a sufficient condition for the successful implementation of a digital transformation process. To address this limitation, Teece, Pisano and Shuen (1997) proposed the theory of Dynamic Capabilities, asserting that organisations' competitive advantage rests on their ability to continually renew, reshape and redeploy their resources to adapt to changes in the economic environment. This perspective is particularly relevant for museums, whose environments are changing rapidly due to new technologies, diverse visitor preferences, evolving cultural policies and growing competition between tourist destinations. According to Teece (2018), the foundations of dynamic capabilities comprise three key activities: identifying (sensing) and seizing opportunities, as well as continuous organisational transformation (transforming). Several recent studies have shown that the success of digital transformation projects in cultural institutions depends on the presence of these three activities.

The existing literature indicates that the most significant organisational capabilities combine several complementary components. The first concerns leadership strategies. Warner and Wäger (2019) argue that digital transformation results from strong and committed leadership in developing a robust,

guiding vision and its implementation, mobilising crucial resources, and managing all necessary changes. Kraus et al. (2022) confirm this observation by demonstrating that organisations with dominant and pervasive digital leadership are able to innovate more rapidly and become more mature ‘‘ on the digital spectrum. In museums, this type of digital project leadership involves not only the museum’s senior management, but also curators, IT managers, cultural outreach specialists, and all staff involved in digital work.

A second important area of study concerns human resources and digital skills. Westerman, Bonnet and McAfee (2014) argue that it is the skills of the workforce that determine the success of an organisation’s digital transformation, rather than the technologies it possesses. With regard to the museum sector, Bellio, Casarin and Nuccio (2022) argue that, amongst other factors, institutions’ ongoing use of digital skills and technologies focuses on improving project management, communication, data analysis and mediation, as well as cultural interaction. Nikolaou (2024) considers that the lack of such skills is the main obstacle to the digital transformation of European museums.

The majority of researchers emphasise the importance of organisational learning. Argyris and Schön (1996), for example, assert that organisations are most successful when they learn from their own practices and experiences and are able to adapt to a changing environment. This is particularly true for digital museums, which are characterised by constant and rapid changes in the technologies available. According to Garzoni et al. (2021), organisations capable of adopting a culture of continuous learning demonstrate a strong capacity for innovation, as well as a high level of resilience in the face of constant technological change. The creation of new collaborations and the associated sharing of knowledge are characterised, in particular, by partnerships with universities and professional networks.

Another important aspect is digital governance. Vial (2019) argues that, for a successful digital transformation, different departments within an organisation must work together to ensure that digital initiatives do not remain the preserve of a few specialist departments. Verhoef et al. (2021) corroborate this view. They argue that organisations which integrate digital technologies into all aspects of their activities and organisational processes make the best use of these technologies. In the museum sector, Bellio et al. (2022) suggest that institutions which implement cross-functional governance of digital projects develop more coherent and sustainable strategies than those where digital initiatives are confined solely to IT departments.

A significant contribution of recent literature is the recognition of the capacity to innovate as an integral part of an organisation’s capacity. According to the OECD (2018), technology plays a minimal role in the public sector’s capacity to innovate. Instead, innovation in public organisations relies on the ability to create, learn and collaborate with the surrounding environment. This is particularly true for museums, as innovation encompasses technology, new methods of outreach, business models and new forms of visitor engagement.

According to Trunfio and Campana (2020), the museums that stand out in terms of innovation are those that have developed advanced forms of digital participation, including social media, collaborative websites and participatory content.

In developing countries, the importance of organisational capacity tends to be even greater. The scarcity of financial capital generally leads cultural institutions in developing countries to prioritise a more efficient use of available resources rather than increasing investment in technology. UNESCO (2023) argues that the most effective digital initiatives in developing countries result from collaborations involving public sector institutions, universities, technology companies and international organisations. This combination of partnerships drives the development of relevant solutions and the transfer of expertise to the developing country, whilst addressing gaps arising from financial constraints.

Morocco offers a fascinating example of this phenomenon. The reforms undertaken by the National Museum Foundation demonstrate a growing propensity to integrate digital tools to enhance cultural heritage. Nevertheless, the work of Selkani (2021) and Nabil and Moutaoukil (2024) suggests that an organisation’s capacity remains the primary determinant of institutional performance. These authors indicate that museums with better staff, well-developed academic partnerships and a more established governance system demonstrate a higher degree of digital maturity than those whose activities are limited to a few isolated projects. Ez-zahrany et al. (2024), for their part, argue that the digitisation of Moroccan heritage requires greater development of behavioural skills alongside technological investments.

The literature reviewed indicates that considerable progress has been made in this area. Publications prior to 2015 focused on digital and technological aspects. From the late 2010s onwards, researchers began to consider organisational, human and strategic aspects. Currently, the prevailing view is that organisational aspects constitute the key factor explaining the success of museums in the digital transformation of their strategies. The debate now centres more on the components of

these strategies than on organisational aspects. Whilst Barney (1991) and Teece et al. (1997) emphasise the strategic dimension, organisational resources and dynamic capabilities, Warner and Wäger (2019) stress digital leadership, Bellio et al. (2022) focus on organisational governance, whilst Nikolaou (2024) emphasises the human aspect and change management. With this in mind, organisational aspects encompass an organisation's resources, skills, governance, learning and innovation. It is this complexity that prompts us, in the following section, to analyse the limitations associated with perceived constraints in the digital transformation of museum organisations

3.3. Perceived Constraints to Museum Digital Transformation

Although there have been remarkable advances in the digital transformation of museums in recent years, studies show that the challenges associated with the adoption of digital technologies have not diminished and may even threaten the success of digitisation initiatives. Early studies attributed these challenges almost exclusively to technological shortcomings. Gradually, more and more authors recognised that the challenges faced by the cultural sector were more complex and that they were, in part, economic, organisational, human, institutional, as well as social and cultural. This constituted a major paradigm shift in research. Nowadays, these challenges are no longer viewed as separate problems, but rather as the building blocks of the digital transformation of cultural organisations.

In early studies on the challenges of digitisation, the main challenge was perceived as a lack of funding. In the early 2000s, some authors highlighted that the difficulty for museums in carrying out digitisation and sustained technological upgrades, as well as maintaining the necessary infrastructure, lay in the prohibitive cost of digital technologies. This remains the case today. According to ICOM (2021), many museums still lack sufficient funding to provide basic support for their collections, develop their digital infrastructure and offer staff training. In a similar vein, UNESCO (2023) notes that, in developing countries, cultural organisations struggle to secure sustained funding for their digital initiatives, which contributes to the considerable imbalance that exists between different museum systems around the world.

Attributing the constraints of digitisation primarily to issues of insufficient funding now seems too simplistic. Nylén and Holmström (2015) argue that the failure of digital transformation is rarely the result of a lack of available technology. More often, failure occurs when an organisation

lacks the capacity to integrate the relevant technology into its day-to-day operations. In line with this thinking, Vial (2019) asserts that the main challenges relate to change management within the organisation rather than to the technology itself. Today, the pace of development of digital technologies is, and will continue to be, much faster than that of organisational structures, which will widen the gap between the potential offered by digital technology and organisations' ability to harness that potential effectively and efficiently.

This gap is particularly pronounced in museums. Bellio, Casarin and Nuccio (2022) argue that many museums undertake the purchase of digital technologies without a strategy, or with little or no strategy, for a corresponding comprehensive transformation of the organisation. Such unplanned investment often leads to low-impact projects where the work is confined to IT or technical departments. In a similar vein, Nikolaou (2024) asserts that the most effective digital projects are those that involve all departments of the museum in developing a common objective, whereas technology-led projects tend to face sustainability issues.

One of the constraints frequently mentioned in the literature is the lack of digital skills. As the digital landscape becomes more advanced and complex, the demand for more sophisticated digital skills is increasing. As Westerman, Bonnet and McAfee (2014) point out, digital skills require a combination of more advanced technical, managerial and interpersonal skills. Given the wide variety of professional roles involved in digital projects within the museum sector – for example, curators, conservators, historians, cultural mediators, IT specialists, interface designers and communications managers – all of whom must work together, the museum sector faces a more pressing concern. Bellio et al. (2022) illustrate that whilst this situation offers a degree of flexibility and adaptability, it also presents challenges, particularly when there is a disparity in digital skills amongst the various stakeholders involved in a project.

Similarly, the researchers highlight the presence of a more reluctant attitude towards change. Since Kotter's (1996) pioneering work, change management has been recognised as a crucial element in the successful transformation of any organisation. In the context of museums, several authors have noted that many museum professionals perceive the introduction of digital technologies as a threat that could undermine their traditional methods of collection management and cultural mediation. In this context, Parry (2013) argued that the fear of compromising the integrity of face-to-face cultural encounters has led to resistance. Economou (2016) also pointed out that many cultural heritage specialists consider that digital technologies should be treated as

supplementary tools within the framework of overarching 'museums of the future' strategies. In contrast, Trunfio and Campana (2020) argued that digital technologies extend and reinforce traditional methods of cultural mediation.

Another category of constraints relates to the limitations of existing technologies. Of course, there are now more digital technologies available. However, their integration into museums remains problematic. Rapid advances create a hostile environment of constant change. There is a serious issue regarding system interoperability, rapid technological obsolescence, as well as the confidentiality and security of digital data. Bekele et al. (2018) note that immersive technologies require constant modification, updating and maintenance. Yang et al. (2025) emphasise that technological systems using artificial intelligence demand new governance frameworks, as well as ethical and moral frameworks, to address the newly created dependence on 'data'.

Recent studies have also highlighted several institutional limitations. According to Verhoef et al. (2021), the digital transformation of the environment stems primarily from the interplay of various public policies, funding mechanisms and regulations. Many cultural institutions are locked into relatively rigid bureaucratic systems that slow down technological investment and severely limit their capacity for innovation. This is the case for the majority of public institutions, where slow bureaucratic decision-making contrasts sharply with the more agile decision-making found in private institutions. Kraus et al. (2022) argue that this is a major obstacle to public sector initiatives aimed at advancing digital transformation.

In less developed regions, these problems are exacerbated by more severe structural constraints. Reports by UNESCO (2023) show that a number of African countries still face problems linked to budgetary constraints, inequalities in access to digital resources and a shortage of qualified staff in the fields of cultural heritage and digital technologies. This has a negative impact on the ability of cultural institutions to pursue ambitious plans and initiatives to create digital resources, even when the intentions of cultural policymakers are sound.

Morocco has also been affected by these factors. Research by Selkani (2021) reveals that, in Morocco, the digital projects of the National Museum Foundation are making a significant contribution to the modernisation of the country's cultural heritage. However, the author points out that these projects are concentrated in a limited number of museums, with a narrow network reach. According to Nabil and Moutaoukil (2024), these projects face common challenges, such as a lack of

funding, low digital skills, disparities in equipment, and the absence of a comprehensive digital transformation strategy for Moroccan museums. However, the authors note that a number of institutions, which have established partnerships with universities, technology companies or international organisations, are better placed to innovate.

In their work, Ez-zahrany et al. (2024) cite similar challenges and emphasise that the promotion of Moroccan heritage through tourism faces the same obstacles. The authors note that several digital initiatives are poorly aligned with, and integrated into, efforts to promote the country's tourism and economic sectors. This fragmented approach to cultural; digital and tourism policies constitute the greatest challenge to the implementation of a comprehensive digital strategy for Moroccan heritage.

Several researchers have expanded on these arguments by highlighting the positive aspects associated with the obstacles to digitalisation. Warner and Wäger (2019) argue that constraints can act as drivers of innovation if they compel organisations to acquire new skills and adopt new forms of collaboration. Teece (2018) shares a similar view when he states that the essence of dynamic capabilities lies in organisations' ability to transform environmental constraints into strategic opportunities. In the context of museums, this implies that the obstacles encountered during digital transformation processes can lead to the development of new organisational models, new collaborative governance structures and new models of cultural mediation.

A comparative review of the existing literature on the subject reveals a consensus in the most recent studies regarding the barriers to digital transformation. Today, the obstacles most commonly associated with the digital transformation of museums are organisational in nature, rather than technological. Whilst early studies focused on barriers related to material and financial resources, recent studies emphasise those linked to governance, human and social capital, strategic leadership and organisational culture. This shift in thinking logically lays the foundations for the next section of this study concerning the visitor experience, which has become the primary focus of contemporary digital transformation strategies in museums.

4. Visitor-Centred Digital Museums: Enhancing the Experience Through Digital Transformation

Over the past decade or so, scholarship on museums has increasingly focused on visitors rather than on technologies. The majority of early writings centred on digital frameworks and technical mechanisms. More recently, authors have

argued that the success of an institution's digital transformation should be assessed in terms of its ability to enhance the visitor experience. This represents a significant shift in the paradigm of museum studies. The museum is no longer seen merely as an institution that houses and protects collections of artefacts, but as an organisation that provides and/or facilitates cultural, emotional, educational and social experiences. This vision is in line with Pine and Gilmore's (1999) framework of the experience economy, in which contemporary organisations achieve a higher level of value by offering experiences so remarkable and memorable that they far exceed the provision of goods and services.

This shift is particularly evident in studies on digital museums. According to Falk and Dierking (2016), the museum experience is the result of an ongoing interaction between three elements: the visitor, the social and cultural context of the visit, and the space – whether physical or digital – provided by the museum. This breaks with the traditional view that a visit is merely a one-way transfer of information. On the contrary, this perspective shows that the museum visitor is an active participant in the experience and is influenced by their own expectations and knowledge, as well as by the social and relational interactions they establish with the museum's mediation tools.

Recent studies confirm this trend. Trunfio and Campana (2020) illustrate how digital technologies in museums offer more interactive, personalised and participatory experiences compared to traditional models. The authors explain that freedom and control over the discovery process are enhanced by mobile technologies, through the use of flexible and controllable augmented and virtual reality, as well as digital audio guides and digital support frameworks. Similarly, Bec and al. (2024) demonstrate how immersive technologies not only enhance learning and positive emotions, but also visitors' cognitive engagement, contributing to greater public involvement. For this reason, digital experiences engage the public more deeply and serve to bring the public closer to the collections, rather than being perceived, as in the past, as a mere technological add-on.

This development is confirmed by Styliani et al. (2009) who, like others, emphasise that in virtual environments, the physical constraints of museums no longer constitute an obstacle. Thanks to digital technologies, visitors can access collections before, during and after their visit, follow their own itineraries, and even determine the levels of content they wish to explore. More recently, Yang et al. (2025) demonstrate how artificial intelligence offers even greater personalisation of content based on visitors' profiles, age,

language and interests. This personalisation represents one of the most significant advances in Smart Museums.

Nevertheless, some researchers are not as optimistic about this development. With regard to immersive technologies and their educational opportunities, Bekele et al. (2018) take a more optimistic view. Economou (2016) argues that the development of more advanced digital technologies must not come at the expense of the heritage artefacts themselves. According to this author, the greatest threat to the sector is the 'spectacularisation' of museums, that is, when visitors are more interested in digital devices than in the artefacts and collections that these devices are supposed to showcase. He also believes that a balance must be struck between technological advances and the authenticity of heritage. This position has been shared by many researchers in the sector.

This opposing viewpoint has become one of the most significant and widely recognised debates in the literature. The majority of researchers cite digital technologies and their impact on the modernisation of cultural institutions (Verhoef et al., 2021; Kraus et al., 2022; Li et al., 2024) as some of the most critical aspects of the profession. On the other hand, many authors still emphasise the importance of a certain level of non-digital interaction with artefacts in order to fulfil the essence and mandate of the museum as a social space (Cameron & Kenderdine, 2007; Economou, 2016). Rather than being in opposition, these two perspectives—on the continuum between non-digital and digital technologies—have now been documented and appear to complement one another. The findings of more recent studies have shown that, in reality, when digital technologies are integrated into a non-virtual or physical context, they have more positive effects.

The visitor's experience is multifaceted. Packer and Ballantyne (2016) identify interrelated components that make up this experience: cognitive, relating to knowledge acquired; emotional, resulting from the affective response to the artwork; social, developed through visitors' interactions; and hedonic, relating to the pleasure experienced during the visit. These components are not mutually exclusive. For example, digital technologies offer opportunities to learn interactively, to engage emotionally through immersive experiences, and to expand social interactions before, during and after the visit, through the use of social networking technologies.

Participants are no longer simply seeking information. They want to become active contributors to the creation of their cultural experience. Prahalad and Ramaswamy (2004) describe this transformation as a system of co-creation of value. Here, the cultural service experience is redefined, with the visitor established as a key contributor. Simon (2010)

identifies this paradigm shift, as visitors now actively participate in the construction of cultural experiences by sharing their comments and photographs on social media and engaging with collaborative online platforms. Consequently, museums are no longer merely repositories of one-way factual knowledge. They have become active forums for engagement and collaboration between cultural professionals, visitors and communities.

Social media and its significance for various sectors cannot be ignored. As stated by Kaplan and Haenlein (2010), social media is radically changing the way organisations and users interact, as it enables a continuous exchange of information and experiences. For the museum sector, as noted by Villaespesa and Wowkowych (2020), social media offers visitors the opportunity to extend their experience beyond the museum's walls, to provide feedback, to interact with other visitors, and to help promote the institution. Digital social media is a way of extending the experience and helps museums achieve social visibility and enable visitors to become part of a wider cultural community.

This phenomenon is beginning to emerge in the Moroccan context. Many museums within the National Museum Foundation in Morocco now use social media, virtual tours, interactive technologies and digital content to enrich the visitor experience. Selkani (2021) notes that the Moroccan Virtual Museum facilitates greater access to national collections for visitors who live far away. Nabil and Moutaoukil (2024) also state that the digital technologies employed in Moroccan museums promote cultural mediation and improve communication between museums and their visitors. The same authors note that the lack of empirical studies to assess the visitor experience and the heterogeneity of initiatives are challenges in this field.

This observation constitutes the first notable gap in the Moroccan literature. Unlike international studies, which use quantitative models to measure the relationship between digitisation, experience, satisfaction and loyalty, Moroccan studies are primarily descriptive. The analyses focus on the presentation of digital tools or institutional initiatives without examining visitors' perceptions or the mechanisms that underpin the construction of cultural value. The aforementioned absence of empirical validation is identified as a key gap to be addressed in the Moroccan context.

A comparative review of the literature suggests that the visitor experience is now the key indicator of the success of digital transformation strategies. The evaluation of digital technologies goes beyond their technical performance to consider their ability to offer a richer, deeper, more inclusive

and memorable experience. It is this development that explains why recent literature is focusing more on the impact of these experiences on satisfaction, the most widely studied variable in research on digital museums. This variable will therefore be the focus of the next section.

4.1. Visitor Satisfaction in Digital Museums

Currently, visitor satisfaction is a central focus in the majority of studies on museum management and the cultural tourism sector. Although early studies focusing on satisfaction described it as an indicator of the quality of services provided, recent approaches recognise that satisfaction is a complex construct linking elements of the experience and the subsequent actions visitors will take. With regard to digital museums, satisfaction is one of the key impacts of digital transformation, as well as acting as a bridge between the cultural experience, visitor engagement and the intention to take action. This trend helps to explain why most models addressing the digital transformation of cultural institutions incorporate satisfaction.

The concept of satisfaction dates back to Oliver (1980), who proposed a single definition combining both cognitive and emotional aspects. It stems from the consumer's expectations and their perception of how well the service has been delivered. Within this framework, satisfaction is independent of service quality and is determined by the expectations set prior to the experience. The theory of expectation confirmation is, by far, the most widely adopted in the study of tourism, services marketing and cultural management. Oliver (1999) extends this framework by suggesting that satisfaction influences loyalty, as well as the intention to revisit and recommend the service.

The gradual application of this theory to museums has deepened our understanding of the concept. Kotler and Kotler (2000) argue that visitor satisfaction is not solely linked to the museum's collections, but results from every interaction with the cultural institution. According to them, satisfaction is the result of the quality of exhibitions and services, the welcome, accessibility and the environment, as well as the museum's cultural mediation. This multidimensional approach has been reflected in recent studies on digital museums.

With the advent of digital technologies, several authors have noted that the traditional elements of satisfaction have begun to evolve. According to Trunfio and Campana (2020), visitors have started to assess the quality of the digital resources offered by the museum. Consequently, mobile apps, virtual tours, audio guides, augmented and touchscreen interfaces have become essential components of the quality of service

provided by museums. This phenomenon has been further supported by Bec et al. (2024), who argue that, unlike traditional, immersive technologies incorporated into a museum setting significantly enhance satisfaction by offering an emotional and interactive learning experience.

However, digital technologies can lead to user dissatisfaction, and research suggests that not all such effects are positive. Bekele et al. (2018) argue that, in some cases, the use of immersive technologies facilitates understanding of exhibition objects and enhances the visitor experience. However, unnecessarily complicated or disconnected technologies, which do not intuitively link to heritage content, can be unsatisfactory. Such dissatisfaction may be caused by the over-use of certain technologies. Economou (2016) emphasises the importance of intentionally incorporating digital tools for cultural mediation rather than simply relying on digital technologies for their own sake.

Empirical studies also show that the level of satisfaction depends on the context and can therefore be tailored to some extent. Verhoef et al. (2021) argue that the digital age offers an opportunity to improve service delivery in a way that is specific to each user. Museums have utilised personalisation in a variety of ways, such as tailored messages, content adapted to age or cognitive abilities, interpreters from diverse linguistic backgrounds, and assistive technologies for people with disabilities. Li et al. (2024) have argued that personalisation is context-dependent and that greater satisfaction is associated with a higher perception and perceived quality of cultural services.

Satisfaction results from multiple dependent variables. Antón, Camarero and Garrido (2018) also distinguish between cognitive, emotional and social satisfaction, as well as the overall satisfaction that encompasses them all, which they term 'general satisfaction'. The cognitive dimension concerns the quality of the information. Emotional satisfaction refers to the emotions (generally positive) evoked by the visit. Social satisfaction relates to the interactions the visitor has had with other visitors. Overall satisfaction encompasses all of the above. This approach to the structure of satisfaction in digital museums is highly relevant, as the various technologies used in these museums can simultaneously influence multiple dimensions of learning, emotions, social interactions and aesthetic perceptions.

The influence and role of emotions in satisfaction are also examined in recent literature. Whilst the initial focus was on visitors' cognitive evaluations, the role of emotions in this process is now recognised by various authors as a key determinant of satisfaction. In this regard, Hosany and Gilbert

(2010) state that the positive emotions experienced during a visit have a direct impact on visitors' overall evaluation of the experience. The same applies to the museum experience. In their research, Packer and Ballantyne (2016) found that visitors who experienced high-intensity emotions also reported higher overall satisfaction and a greater willingness to return to the museum.

A large number of authors also agree that satisfaction and the quality of the experience are closely linked. According to Falk and Dierking (2016), in addition to the works on display, visitors also evaluate the rest of their visit to the museum. Entrance areas, signage, interactions with staff, digital and other learning opportunities, as well as the flow of visitors through the space, also influence overall satisfaction. In this regard, digital technologies form part of the experience, as they are considered an element of the overall experience.

Research on smart museums demonstrates the role of satisfaction in assessing the effectiveness of digital strategies. In particular, Yang et al. (2025) found that museums using AI to create personalised, engaging and inclusive experiences are rated more highly by visitors. However, the authors note that the quality of digital interfaces is a major concern. Visitors may experience reduced satisfaction due to poorly designed or overly complicated interfaces, even if a museum employs advanced technologies.

There are few studies on visitor satisfaction in Moroccan museums. The available literature on Moroccan museums tends to focus on digitisation initiatives and their impact on cultural institutions rather than on public satisfaction. However, Selkani (2021) asserts that the virtual tours produced by the National Museums Foundation improve the accessibility of museum collections and the visibility of Moroccan heritage. In the same context, Nabil and Moutaoukil (2024) note that new digital technologies in national museums facilitate visitors' interaction with art, but they acknowledge the lack of quantitative studies measuring the effect of these technologies on satisfaction.

The lack of empirical studies is a major concern in the majority of Moroccan literature. Unlike the international literature, which uses structural equation modelling to assess the relationships between digitisation, experience, satisfaction, loyalty and engagement, the majority of studies on the Moroccan context are descriptive. Visitors' behavioural variables remain largely unexplored, making it difficult to understand how digital technologies create value for national cultural institutions.

Finally, a comparative analysis of the studies reveals a notable degree of agreement. Satisfaction is a key variable linking digital tools and visitors' future behaviour. The main differences between the studies concern the factors that lead to this satisfaction. Some researchers emphasise the technological aspect (Bekele et al. 2018; Yang et al. 2025), others the emotional aspect (Hosany & Gilbert 2010; Packer & Ballantyne 2016), personalisation (Verhoef et al. 2021; Li et al. 2024), or on the quality of the overall experience (Falk & Dierking 2016; Trunfio & Campana 2020). This complementarity illustrates that satisfaction is a multidimensional concept that can stem from the technological aspect, the experience itself and visitors' perceptions. As satisfaction is linked to digital tools and other factors, it leads to visitors' interest in engaging more actively with cultural institutions, which paves the way for the definition of cultural engagement, the next dimension addressed in this literature review.

4.2. Cultural Engagement in the Era of Digital Museums

Cultural engagement has become one of the key concepts in the study of digital museums, cultural tourism and the management of culture and heritage over recent decades. Most of the early studies on engagement in museums primarily measured participation using quantitative indicators, such as visitor numbers or the average length of time spent in museums. However, in more recent studies, the actual performance of cultural institutions is measured by their ability to forge ongoing relationships between visitors and heritage. This perspective marks a radical shift in the understanding of what a museum is. Museums are no longer merely repositories for collections, but are instead cultural organisations with the potential to foster relationships with their audiences before, during and after a visit to the museum. In this regard, new digital technologies offer opportunities to strengthen connections, promote participation and increase the engagement of cultural audiences.

The phenomenon of engagement was first studied in the context of relationship marketing. According to Brodie et al. (2011), engagement is a psychological state that arises from a series of interactions between an individual and an organisation. In this respect, engagement, as described by the authors, goes far beyond satisfaction, as it involves a long-term cognitive, emotional and behavioural state. Gradually, this definition has been contextualised within the field of culture and, in this context, engagement has been understood as the level of emotional connection that visitors develop with a heritage institution. In the context of a museum, Hollebeek (2011) argued that engagement is a relationship that is built up

as a result of visitors' experiences and the emotions they feel during their interactions with various mediation tools.

Dessart, Veloutsou and Morgan-Thomas (2015) contribute to this view by advocating a multidimensional perspective on engagement. As the authors describe, the cognitive dimension relates to participants' interest in cultural content, the emotional dimension concerns participants' feelings towards the institution, and the behavioural dimension relates to visitors' participation in the activities offered by the institution. This perspective predominates in studies on digital museums, as it explains why some visitors cultivate a relationship with the cultural institution, whilst others limit their experience to a one-off, transactional visit.

In the context of digital engagement, the way in which visitors interact with museums has fundamentally changed. Before the widespread adoption of digital technologies, interactions between museums and visitors took place mainly during in-person visits. Today, it is possible to maintain relationships with visitors through digital platforms, mobile technologies, social media, virtual (and augmented) activities, and a multitude of other interactive offerings that can extend beyond the museum's walls. Simon (2010) argues that this shift from the traditional museum to the participatory museum is characterised by a transformation in the way visitors experience and create cultural offerings. This shift, from a passive to an interactive role, strengthens visitors' sense of belonging to cultural communities.

This evolutionary process can also be explained by Prahalad and Ramaswamy's (2004) theory of value co-creation. According to the authors, the value generated by an organisation results from the ongoing engagement between the organisation and its customers. With regard to digital museums, this theory implies that visitors can design their own itineraries, leave comments on the collections, share their experiences and feedback on social media, create their own digital artefacts, and/or participate in various forms of collaboration. Numerous researchers have demonstrated that all such participation helps to enrich the learning process, reinforce positive emotions and foster a sense of ownership of cultural heritage.

From this perspective, digital technologies play a vital role in fostering this engagement. According to Trunfio and Campana (2020), the use of interactive tools enables users to establish a much more personal relationship with the works on display. Compared with traditional methods of cultural mediation, digital technologies allow users to navigate freely through the collection, access a variety of supplementary materials, and tailor the information to their personal

preferences. The authors note that the personalisation of technologies and services makes the cultural collection and its artefacts far more relevant to visitors.

Studies relating to immersive technologies yield similar results. According to Bekele et al. (2018), virtual reality and augmented reality create opportunities for visitors to engage with cultural heritage on a far deeper level. The authors confirm that these immersive environments aid the learning process by making the various contexts of historical heritage enjoyable and easy to understand. This is further confirmed by Bec et al. (2024), who explain that immersive technologies increase engagement and the intention to revisit a site.

However, some researchers prefer to err on the side of caution, advocating a broader view of cultural engagement that goes beyond technology. Economou (2016) argues that increased digital engagement is not a given. It depends on the ability of digital tools to deepen understanding of collections and improve cultural mediation. Technologies can, in fact, focus visitors' attention on heritage objects. This argument is similar to that of Parry (2013), who maintains that, beyond the 'wow' factor of technologies, digital transformations must serve the essential functions of museums.

One of the most significant changes in recent academic literature is the perception of the role of social media in promoting cultural engagement. Kaplan and Haenlein (2010) argue that social media facilitates a continuous and unprecedented two-way flow of information and experiences between organisations and users. In the museum sector, Villaespesa and Wowkowych (2020) state that visitors use (and have used) Instagram, Facebook, X, TikTok and YouTube to post and share their museum experiences, promote and critique exhibitions, share and create cultural and educational content, and deepen their relationships with cultural institutions. As a result, museums are becoming participatory digital communities offering opportunities for engagement that extend far beyond the physical visit, spanning the entire digital sphere.

This also has a lasting effect, as Harrigan et al. (2018) state that digital engagement motivates visitors to change and enhances their level of engagement. They note that those who interact with an organisation's digital assets build a sense of community with that organisation, are more likely to return to its venues, recommend it, and are more inclined to engage with its offerings. This phenomenon of community building is also evident in other cultural organisations, such as museums. Visitors who engage with museums' digital content tend to become advocates for cultural heritage and actively help to reach new audiences with the museum's collections.

Recent years have seen a proliferation of studies recognising the educational potential of cultural participation. Falk and Dierking (2016) acknowledge that participation in museums can be a strong motivator for lifelong learning, particularly when visitors take part in activities. Digital resources enhance this potential as they can provide learning opportunities and resources before, during and after a museum visit. In this regard, Styliani et al. (2009) note that digital resources support visitors' learning processes beyond the museum visit and help to enrich the cultural experience.

With regard to cultural tourism, some authors regard participation as a factor in a region's development. According to Richards (2018), engaged visitors are more likely to promote a cultural destination through digital means, thereby influencing other visitors. This virtual promotion plays a key role in showcasing the culture of the heritage region and making it more attractive to travellers. Like Della Corte and Aria (2016), other authors argue that cultural participation is a key element in the development of a tourism ecosystem based on innovation, participation and an appreciation of local heritage.

In Morocco, the literature on cultural engagement is still in its infancy. Selkani's (2021) research indicates that the digital projects of the National Museums Foundation help to engage visitors and enhance interaction through virtual tours and digital resources. Nabil and Moutaoukil (2024) go on to state that a significant number of Moroccan institutions use social media for cultural outreach, fostering interaction with their audiences. However, the authors emphasise that very few studies measure the actual impact of these activities on public engagement and participation in cultural activities.

The digital tools employed provide access to diverse national collections and strengthen the cultural identity of the nation as well as that of young Moroccans. These tools have the potential to increase national engagement with Moroccan heritage. However, the authors note that these tools remain very limited in scope and scattered across institutions, creating an increased demand for digital infrastructure, specialised staff and the development of customisable interactive content for a wide variety of visitors.

A comparative review of the literature reveals several significant points of convergence. The majority agree that digital technologies enhance engagement through participation, personalisation and social interaction. However, disagreements persist regarding how to describe this relationship. Simon (2010) emphasises participatory collaboration, Prahalad and Ramaswamy (2004) focus on the co-creation of value, Brodie et al. (2011) on the psychological

dimension of engagement, and Richards (2018) on engagement within a regional and tourism context. This diversity illustrates the richness and complexity of the concept.

Although there has been a rapid increase in the number of academic publications, several gaps remain. Most international studies focus on major European, North American or Asian museums. African cultural institutions have been largely neglected, including Moroccan cultural institutions. There are even fewer quantitative studies in the Moroccan context on the relationship between digital technologies, cultural engagement, satisfaction, behavioural intentions and territorial reach. Most existing studies are descriptive and classify digital tools rather than visitors' behavioural mechanisms. This justifies the need to develop conceptual models combining these variables within the context of Moroccan museums.

Digital transformation strategies in cultural institutions have clearly led to an increase in cultural engagement. However, most studies emphasise that this engagement is not an end in itself. Cultural engagement is a key prerequisite for other behavioural intentions such as repeat visits, positive word-of-mouth and loyalty. The following section will focus on this framework of behavioural intentions.

4.3. Behavioural Intentions in Digital Museums

Over the past twenty years, research focusing on user behaviour has shown that the success of a cultural organisation is characterised not only by an institution's ability to attract a large number of users, but by its ability to generate sustainable positive user behaviour. This has led to the use of the term 'behavioural intention' as a means of understanding the fields of marketing, tourism, behavioural psychology and cultural management. Specifically for digital museums, behavioural intention encompasses the user's willingness to (re)visit a cultural institution, to recommend and/or share a digital museum experience and/or content, to engage in new cultural activities, and to interact with cultural heritage institutions in other ways. Consequently, the digital transformation of cultural organisations has focused significant attention on engageability, and behavioural intention is seen as one of the best indicators of the digital transformation of cultural organisations.

Behavioural intention is based on Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA), which states that the majority, if not all, of an individual's future behaviour is centred on their intentions. This theory was further developed by Ajzen's (1991) Theory of Planned Behaviour (TPB), which

introduces the concept of perceived behavioural control to account for certain intentions that do not translate into behaviour. Both theories have had a significant impact on research in cultural tourism and the museum sector, where behavioural intentions predict repeat visits and loyalty recommendations.

The rapid expansion of digital technologies has led some specialists to apply technology acceptance models in their analysis of visitor behaviour. According to the Technology Acceptance Model (TAM) developed by Davis (1989), the intention to use a particular technology depends primarily on its perceived usefulness and ease of use. In the context of museums, this model helps to explain the varying levels of visitor acceptance of mobile technology, digital audio guides and augmented reality. Studies by Venkatesh and Davis (2000) and Venkatesh and Bala (2008) indicate that these technological differentiators play an indirect role in shaping visitors' future behaviour based on the perceptions they form during their visit.

However, recent studies show that behavioural intentions are no longer determined exclusively by technological attributes. As Verhoef et al. (2021) observe, visitors evaluate the quality of all digital touchpoints along their journey before deciding whether to return or recommend the experience. This is consistent with the findings of Trunfio and Campana (2020), who argue that the combination of interactivity, personalisation and immersion in the experience increases a visitor's likelihood of returning to a museum. For these authors, digital technologies should be viewed as facilitators of positive experiences rather than as behavioural differentiators.

Returning is one of the most well-documented dimensions of behavioural intention. Baker and Crompton (2000) argue that the decision to revisit a particular cultural site is determined by satisfaction with the previous visit. This phenomenon is well documented in studies on museums. Antón and Camarero (2015) indicate that visitor satisfaction is a key driver of museum attendance, particularly for museums that frequently change their exhibitions or digital experiences. This is reinforced in many digital museums, where the use of technology allows for continuous changes to the content available to visitors.

Similar conclusions can be drawn from research on loyalty. Oliver (1999) argues that loyalty is primarily the result of satisfaction, as well as the development of a commitment to the organisation. In the case of cultural organisations, loyalty is defined as revisiting the museum, participating in the services on offer, becoming a member, making financial

donations to the organisation, and acting as an advocate for cultural heritage. Rather (2021) describes loyalty as the emotional connection that visitors have with the cultural organisation.

Recommendation intentions, particularly in the context of social media and electronic word-of-mouth (eWOM), have attracted the most attention from researchers. Hennig-Thurau et al. (2004) state that recent advances in digital technology provide visitors with a platform to share their experiences with a wide audience, thereby increasing the importance of individual recommendations. Museums' communication strategies have had to adapt to this change. Unlike in the past, when communication relied on advertising and articles, museums can now draw on user-generated content.

In the museum sector, Villaespesa and Wowkowych (2020) note that social media posts influence people's decisions to visit a museum. Comments, reviews and other digital content posted on Instagram, Facebook, X, TikTok, etc., shape the museum's image and even influence its appeal. With regard to cultural tourism, Richards (2018) observes a similar phenomenon, whereby digital recommendations strongly influence the choice of heritage tourism destinations.

The quality of the experience also has a significant influence on the intention to revisit. Falk and Dierking (2016) suggest that a visit during which the individual is educated, happy and socially stimulated provides a memorable experience, thereby encouraging the individual to return. This theory is supported by Bec et al. (2024), who, in their research, state that the use of immersive technology increases an individual's intention to return due to the highly engaging and personalised experiences that this technology offers.

In contrast to the authors mentioned above, several others believe that personal intentions do not depend solely on an experience. Brodie et al. (2011) suggest that an experience also influences an individual's intention to engage with the organisation. Hollebeek (2011) indicates that active visitors also form an emotional connection with the organisation. In this case, the experience must be complemented by meaningful cultural engagement in order to maintain loyalty to the organisation.

This relationship between satisfaction and commitment has led several researchers to propose integrated models. According to Rather (2021), individuals who have a cultural experience report higher level of satisfaction. They are more likely to engage with the organisation, remain loyal to it and recommend it to others. Parallel findings by Verhoef et al. (2021) support the view that, following digital transformation,

the experiences, perceptions and feelings formed during a visit also influence future behaviour. These models are useful for research involving structural equation modelling (SEM) as they illustrate the direct and indirect relationships between the variables under study.

The importance of emotions in influencing behavioural intention is also recognised in more recent literature. Hosany and Gilbert (2010) found that positive emotions among visitors foster a greater intention to return and to recommend the visit, in contrast to participants whose experience was more rational. The use of digital technologies in museums is particularly well-suited to creating positive emotions through the use of immersive technologies, combined with interactive narratives and the use of personal devices. Economou (2016), however, cautions that these technologies must serve the interpretative content of the heritage in order to preserve the quality of the cultural experience.

Research on smart or modern museums also highlights the importance of behavioural intentions for the development of cultural regions. Yang et al. (2025) argue that satisfied and engaged visitors become advocates for a cultural site, subsequently sharing their digital experiences and influencing the behaviour of other visitors. This process creates a virtuous cycle for a region's cultural appeal and the development of cultural tourism.

In the Moroccan context, there are few studies dedicated to behavioural intentions. Selkani (2021) notes that the National Museums Foundation's digital projects facilitate access to heritage and foster greater engagement between the Foundation and its visitors. However, the author does not assess the impact of these projects on the likelihood of repeat visits or on recommending a visit to others. Nabil and Moutaoukil (2024) also note digital progress in several Moroccan museums and positive changes in visitor numbers, but they highlight the continuing shortcomings in the analysis of museum visitors' behavioural responses. The lack of quantitative analysis is one of the main limitations of the available literature in Morocco.

The majority of studies in Morocco address the digitalisation of museum networks in terms of digital policies, but integrated behavioural frameworks, relating to the functioning of cultural institutions, remain absent. The same applies to frameworks that integrate digitalisation, organisational capabilities, perceived constraints, visitor experience and satisfaction, as well as cultural engagement and behavioural intentions. This represents a profound conceptual gap, as national frameworks for integrated strategies to promote heritage and cultural tourism rely heavily on new digital technologies.

Having conducted an exhaustive review of the available international studies, we observe numerous similar patterns. Several authors emphasise that behavioural intentions result from a multi-dimensional system based on the quality of the experience, satisfaction, emotional involvement and digital interaction. The main differences in the literature concern which variable has the most significant impact. In marketing, for example, models prioritise satisfaction (Oliver, 1999), whilst in more recent literature, engagement (Brodie et al., 2011; Hollebeek, 2011) or immersion (Bec et al., 2024; Trunfio & Campana, 2020) are given greater prominence. Although differences exist, the main consensus is that improving the quality of the visitor experience at a cultural institution is the primary objective of digital transformation, and consequently, this transformation has a considerable impact on visitors' future behaviour.

This review complements the fourth theme concerning visitor behaviour and highlights the interrelationship between experience and satisfaction, cultural engagement and behavioural intentions. However, research indicates that the impacts of digitalisation are not limited to museums. Digital technologies help to enhance the image of tourist destinations and strengthen the competitiveness of their tourism markets, whilst promoting the economic, social and cultural development of their respective regions. These aspects will be explored in the following section on Digital Heritage and Territorial Development.

5. Digital Heritage and Territorial Development

Advances in digital technology have diversified the methods available for integrating cultural heritage into modern regional development. Early versions of policies aimed at the protection and promotion of cultural heritage focused primarily on the preservation of sites, monuments and collections. More recent policies and frameworks focus on digitisation and (inter)active communication, as well as the mediation of cultural heritage. This trend extends beyond the confines of cultural institutions and aligns with regional development policies in which cultural heritage is regarded as a catalyst for competitive advantage, attractive tourism, innovative practices and a sustainable economy. The majority of researchers now regard digital heritage as the key driver of change for cultural destinations in the 21st century.

The understanding of digital heritage has evolved since UNESCO adopted the Charter on the Preservation of Digital Heritage in 2003. This concept was used to describe cultural assets created in or converted to digital form in order to preserve them for posterity. More recently, the literature has argued that digital heritage transcends the mere digitisation of

collections. According to Cameron and Kenderdine (2007), digital heritage forms a new mediating environment that facilitates new forms of interaction between visitors, collections and spaces. This view is supported by Economou (2016), who asserts that digital technologies are significantly changing the ways in which cultural heritage is produced, disseminated and experienced.

This development is particularly evident in studies focusing on tourist attractions. Today, according to Richards (2018), the competitive advantage of heritage cultures lies as much in their heritage resources as in their use of digital technologies to transform the visitor experience. The most innovative tourist attractions are building digital ecosystems comprising museums, monuments and archaeological sites, as well as information and communication technology (ICT) services, social media and other connected services. This not only improves the services on offer but also provides an opportunity to better integrate the various stakeholders at local and regional level, whilst increasing the visibility of the tourist destination on a global scale.

This development is also reflected in the work of Boes, Buhalis and Inversini (2016) on Smart Destinations. The authors state that smart destinations result from the integrated use of digital technologies, organisational change, collaborative governance and visitor engagement. From this perspective, digital museums are not isolated institutions, but critical infrastructure within smart territorial systems. Consequently, digital technologies offer the opportunity to simultaneously improve the management of tourist flows, the promotion of cultural heritage, the dissemination of information and the stimulation of the local economy.

This development is also in line with the objectives of sustainable regional development. According to UNESCO (2015), cultural heritage contributes directly to several Sustainable Development Goals (SDGs), notably social inclusion, the preservation of cultural identity, job creation, the promotion of sustainable and purpose-driven tourism, and the stimulation of creativity and innovation. In this sense, digital technologies support and enhance cultural heritage resources by improving access to cultural resources, reducing certain spatial constraints, and offering opportunities for local residents to participate in the transformation and promotion of cultural heritage.

This new perspective is encouraging many researchers to view museums as instruments of regional development rather than merely as cultural institutions. Della Corte and Aria (2016) argue that, unlike in the past, museums contribute to the creation of regional value by enhancing the attractiveness and

competitiveness of the economy, as well as the cultural and social cohesion of regions. This is particularly true of heritage tourism, where museums are often at the heart of the tourist offering.

Furthermore, researchers emphasise that the territorial impacts of digitalisation do not occur spontaneously. Verhoef et al. (2021) assert that the use of digital technologies will only create value when combined and integrated with a certain level of governance, innovation and organisational capacity, as well as the participation of various stakeholders. This is also supported by Kraus et al. (2022), who argue that the digital transformation of regions depends primarily on the interdependencies and links between public institutions, private companies, universities and cultural organisations.

This is particularly true for the majority of developing countries. According to reports by UNESCO (2023), the most impactful and effective digital strategies are the result of collaborative efforts and partnerships involving the sharing of resources, the joint development of digital skills and the transfer of technology. The authors argue that, when integrated into a coordinated regional vision, digital heritage has the potential to act as an economic driver.

Morocco is gradually beginning to demonstrate how cultural evolution takes place, and for several years now has been focusing on the digitisation of cultural heritage within the context of tourism and regional development. This has been achieved through the work of the National Museum Foundation, as evidenced by the digitisation of heritage, virtual tours and the creation of interactive digital outreach platforms, with the aim of positioning Moroccan museums within the ecosystems of international digital transformation. As Selkani (2021) and Nabil and Moutaoukil (2024) state, this transformation is limited to uneven efforts amongst cultural institutions and calls for the integration of cultural, digital and tourism policies.

Ez-zahrany et al. (2024) state that Morocco's cultural heritage is gradually being digitised on the international stage, enabling the continued growth of cultural tourism. The authors emphasise the importance of digitising Morocco's heritage; as a result, new audiences are being engaged, and Morocco is increasingly positioned as a cultural destination, although the economic and territorial impacts of these initiatives have not been sufficiently assessed by empirical studies.

This analysis highlights a major weakness in the existing literature. The impact of digitisation on various cultural institutions has been analysed in detail, as has been the case

for cultural tourism policies. A cross-analysis of the various components of the digital ecosystem – such as the organisational logic of museums, the digital technologies that mediate visitor experiences, and behavioural patterns – in which the integration of organisational, behavioural and territorial dimensions is analysed in depth, is of great importance.

This preliminary examination of digital heritage thus refers to the more concrete concept of territorial attractiveness, which is currently one of the predominant concepts used to describe the impacts of heritage digitisation on the economy, society and culture. Consequently, the following section will address the theoretical basis of territorial attractiveness and how digital museums enhance the competitiveness of cultural destinations.

5.1. Territorial Attractiveness: Digital Heritage as a Driver of Competitive Destinations

Territorial attractiveness is currently one of the key concepts in the fields of cultural tourism, regional development and destination management. Originally, this concept analysed regions' ability to attract investment, businesses and a skilled workforce. It has since been expanded to include heritage and culture. Researchers have come to regard cultural assets as a key element in distinguishing regions, combining economic competitiveness and international visibility whilst supporting the sustainable development of destinations. In this context, digital museums are seen as a lever for shifting this balance by showcasing local heritage and enriching the visitor experience.

Early studies on regional attractiveness focused on economic factors. According to Porter (1990), this refers to regions' ability to create sustainable competitive advantages through various tactical resources, infrastructure and innovations that will determine regional competitiveness. This paradigm was the main driver of regional development policies in the 1990s. However, contrary to this dominant approach, a number of researchers have shown that, in the changing context of the global economy, international competition and the knowledge economy, economic factors are, in the majority of cases, insufficient to explain regional productivity.

Florida's work (2002) provides a partial basis for the development of the Creative Class theory. Florida argues that the regions with the highest levels of attractiveness are those characterised by environments enriched by a culture of creativity and innovation, and by a good quality of life. From this perspective, a region's attractions – such as cultural facilities, museums, cultural festivals, heritage sites and arts

organisations – are key to its appeal. This perspective encourages placing culture at the forefront of strategies for economic development and cultural tourism.

Richards (2018) notes that, when considering cultural tourism, the contemporary consumer of culture is not satisfied with the commodification of culture in the form of all-inclusive tourism. Consequently, this requires the implementation of culturally innovative services to maintain a viable position in the competitive market. Museums play a vital role in this development as they help to shape a tourist destination's identity and its cultural offering. Innovative digital technologies provide a further advantage in this endeavour by creating a more accessible and immersive experience.

This line of thinking is explored in greater depth in the context of Smart Destinations. In the work of Boes, Buhalis and Inversini (2016), the integration of smart technologies works together to create a seamless travel experience. As part of this integration, mobile apps, digital platforms, geolocation, artificial intelligence and the Internet of Things can enhance the range of tourism services whilst strengthening the functionality of a specific region. Consequently, the context of smart destinations also involves the role of digital museums.

Buhalis and Amaranggana (2015) outline another aspect of this development by pointing out that smart destinations stem from collaborative governance involving the public and private sectors, cultural organisations, higher education institutions and citizens. According to them, digital tools are only valuable when they foster collaboration between different stakeholders within a given region. This argument is supported by the work of Della Corte and Aria (2016), who argue that museums play a key role in the creation and development of regional networks, enhancing not only the attractiveness of the destination and tourism, but also cultural and economic competitiveness.

Recent studies have confirmed these phenomena, asserting that a destination's digital visibility is an essential prerequisite for its attractiveness. Xiang and Gretzel (2010) argue that, with the advent of the internet, a tourist's preparation for a trip takes place mainly via the internet or by using its resources. Consequently, the content available on digital channels, search engines, official websites and social media exerts a dominant and decisive influence on a destination's image and perception even before the actual visit takes place. The implications of this trend are immense for the cultural industry, and are driving a move towards higher-quality digital content production.

Among emerging digital tools, social media are the most significant. Kaplan and Haenlein (2010) argue that these tools have the capacity to disseminate tourist experiences to a wide audience in real time. In the cultural sector, Villaespesa and Wowkowych (2020) argue that museum visitors have become producers of digital content by taking and sharing photographs and videos, and by posting their comments and recommendations. This type of content, through its online presence, shapes a destination's image and influences potential visitors' choice of destination. In this context, a digital museum represents a type of museum that contributes to the development of destination marketing based on the user experience.

The future development of these tools will involve a combination of artificial intelligence, big data and predictive tools. Verhoef et al. (2021) state that tourist destinations can use these digital datasets to adapt rapidly to tourists' expectations and refine the experiential offering of destinations. This also applies to museums, which can respond to their visitors' behaviour, design personalised visitor itineraries and manage visitor flow within the museum. This leads to greater visitor satisfaction, whilst reinforcing the region's image as an innovative tourist destination.

The impact of integrating digital technologies is not limited to the economy. UNESCO (2015) maintains that digital heritage is a means of promoting social cohesion, safeguarding the diversity of cultural expressions, preserving local heritage and ensuring citizen participation. Digital technologies maximise the opportunity to make museum collections accessible to visitors who may never be able to visit the museum in person, including international visitors, people with disabilities and visitors from remote areas. This opportunity also strengthens a region's cultural presence on the international stage.

Morocco is a fascinating country in which to study such integration. For many years, the Kingdom has been implementing an ambitious plan to integrate its cultural heritage into its tourism development. The programmes run by the National Museums Foundation demonstrate a commitment to enhancing the country's cultural appeal. Selkani (2021) highlights the positive impact of the creation of the Moroccan virtual museum on the international visibility of national collections and on their accessibility to foreign visitors.

Nabil and Moutaoukil (2024) argue that, in Morocco, digitisation is becoming an integral part of the modernisation of museums. It has helped to improve digitally-mediated cultural communication and foster a more interactive and communicative relationship with museum visitors. However, the authors argue that the extent of digitisation varies between

institutions, and that there is no clear link as to how these fits into a national strategy for integrated regional development.

Ez-zahrany et al. (2024) agree with Nabil and Moutaoukil, and assert that the considerable volume of Moroccan cultural products has the potential to put the country on the global tourism map. The authors agree that without the integration of cultural, digital and tourism policies, the full potential of digital tools cannot be realised. They maintain that integrating cultural policies with the heritage sector and regional policies can make a significant difference to the global appeal of Moroccan cultural tourism.

Research into Morocco's heritage cities has also yielded similar findings. Rabat, Marrakesh and Fez possess a significant cultural and historical heritage, and are beginning to prioritise its digital preservation and showcase it to an international audience. The development of two museums – the Mohammed VI Museum of Modern and Contemporary Art and the Museum of Water Civilisations at the Mohammed VI Museum in Marrakech – supports this digital cultural shift in Moroccan museums; however, there is little research into the impact of this shift on tourism.

A critical review of the literature reveals significant gaps. Firstly, international studies focus mainly on Europe, North America and Asia, whilst African countries are largely overlooked. Secondly, research on territorial attractiveness examines the impact of heritage and/or tourism without incorporating the structures and flows linked to the behavioural and organisational aspects of the digital transformation of museums. Thirdly, most studies on Morocco are descriptive and do not formalise explanatory models to address simultaneously the relationships between digital technologies, visitor experience, cultural and behavioural engagement, and territorial attractiveness.

These gaps highlight the need for an integrated model to understand how the digital transformation of museums impacts regional attractiveness. However, attractiveness is merely the initial phase in the creation of value for a region. It has already been documented that digital museums have an impact on regional attractiveness and on the sustainable transformation of a destination's social, economic, cultural and environmental aspects. This will be the subject of the next section on Regional Development.

5.2. Territorial Development: Museums as Catalysts for Sustainable Regional Transformation

Over the past twenty years, the integration of culture, heritage and tourism into integrated regional development policies has

contributed to the emergence of new models for the sustainable development of regions. In contrast to traditional approaches, recent studies tend to highlight the potential of heritage to generate social, economic, cultural and environmental value. When combined with an integrated approach to regional development, these heritage resources can foster innovation, social cohesion and improve quality of life. In this sense, digital museums can serve as innovative tools for reconciling heritage preservation with the promotion of sustainable regional development.

Pecqueur (2005) describes regional development through an approach that goes beyond the economic dimension. With regard to regional development, the identification and promotion of resources are achieved through collaboration between local stakeholders, public authorities, the private sector and the community. Unlike conventional growth models, this approach highlights a region's potential to generate distinctive competitive resources based on its identity, such as culture, history and nature. In this respect, museums play a vital role because, by their very nature, they promote identity-based resources.

Camagni (2008) supports this view, arguing that a region's competitiveness depends more on its intangible assets, such as its cultural heritage, knowledge, innovation and social capital. It is those regions capable of promoting their heritage as a resource that are most effective at attracting visitors, investors and human capital. In this context, an integral component of heritage resources is information and communication technology (ICT), which facilitates the capture and dissemination of heritage resources worldwide and offers greater accessibility.

There are several ways in which museums are expected to contribute to a region's development. The first is through their direct economic contribution. ICOM (2022) argues that museums create employment opportunities, support businesses, encourage cultural investment and promote the development of tourism. Museum patronage stimulates the consumption of other services and generates a positive multiplier effect on the economy. This phenomenon is all the more pronounced when museum networks are integrated into the region's wider tourism network.

Museums also contribute to social development beyond their economic contribution. UNESCO (2015) maintains that social equity and the development of dialogue through knowledge transfer are fostered by cultural institutions, which strengthen the sense of belonging to the region. In this context, it is argued that digital museums have the potential to enhance this contribution. Digital and virtual museums, through their use

of ICT, can offer cultural resources to a more diverse audience and break down barriers to access to culture.

Falk and Dierking (2016) describe how museums support the development of human capital and lifelong learning. They explain how cultural experiences encourage learning and how digital technology contributes to this by offering interactive and personalised content for different types of visitors. They argue that this contribution to learning extends far beyond the classroom, fostering the development of knowledge-based societies.

The digital age will transform this contribution to a region. Verhoef et al. (2021) suggest that the digitisation of culture will enable organisations to extend their reach beyond their physical boundaries. Visitors will be able to access collections, plan and prepare for their visit, continue learning through the museum and interact with it digitally, creating a lasting cultural experience.

Digital technology creates innovative cultural ecosystems. Warner and Wäger (2019) argue that digital transformation encourages cooperation between various regional organisations and facilitates the exchange of data, as well as collaboration on knowledge and technology. This leads to collaboration between museums, universities, research institutes, technology companies, public authorities and the tourism sector. Such collaboration stimulates innovation and gives the region a competitive advantage.

This research validates the Smart City and Smart Destination paradigm. Boes, Buhalis and Inversini (2016) indicate that the application of digital technologies to urban, cultural and tourism systems can be used to build an improved system that enhances residents' quality of life and the visitor experience. Museums in digital cities are therefore key components of a Smart City due to their contribution to the dissemination of knowledge, cultural creativity and the articulation of territorial identities.

The contextualisation of digital heritage within a framework of sustainable development is further reinforced by the recent focus on digital heritage in sustainable development. According to UNESCO (2015) and the United Nations Sustainable Development Goals (SDGs), culture can be regarded as an integrative means of promoting economic, social, environmental and territorial inclusion. Digital technologies can complement this role by enabling the economic, ecological and sustainable management of cultural institutions, whilst reducing the environmental impact of disseminating cultural resources.

In the context of tourism, several authors argue that the digital economy is a key driver for improving the resilience of destinations. The recent health crisis, COVID-19, is a clear illustration of this transformative and adaptive potential. UNESCO (2021) notes that museums which had implemented digital systems were able to continue fulfilling their educational and cultural functions, even when closed to the public. This situation demonstrates that, today, digital systems are essential for preserving an institution's cultural functions and for strengthening regional resilience in the face of crises.

Morocco is making significant progress in this direction. National tourism development strategies are increasingly using cultural heritage as a tool for economic diversification and competitiveness in the international market. The efforts of the National Museum Foundation, the Ministry of Youth, Culture and Communication, and other local authorities demonstrate their commitment to strengthening the contribution of museums to regional development. With regard to ongoing efforts to digitise collections, virtual tours, other digital exhibitions and platforms, the modernisation of museums is a gradual process.

According to Selkani (2021), the digitisation of the Moroccan museum network provides greater international access to the country's museums and thus fosters a better appreciation of Moroccan cultural identity. It also helps to preserve local cultural identity. The author asserts that, with these developments, Morocco is on the verge of becoming a more culturally innovative and attractive destination. The interactions and economic impacts resulting from these efforts remain undocumented.

Nabil and Moutaoukil (2024) also note that many Moroccan cultural institutions have begun to introduce digital innovations into their services. The authors emphasise, however, that the impact of these digital innovations in attracting more visitors and collaborating with stakeholders in tourism, local government and the technology sector remains limited and underdeveloped.

According to Ez-zahrany et al. (2024), the richness of Morocco's cultural heritage offers an opportunity for the country to focus on developing both the local economy and its international presence, through the creation of new employment opportunities. The authors agree that emphasis must be placed on the strategic development of culture, technology and the region as a priority within an integrated governance framework in order to achieve the desired outcomes.

A review of the literature illustrates the important roles played by museums in promoting balanced regional development, and provides a framework for understanding the interactions between economic, social and cultural development. Although some authors agree on the impact of cultural institutions on economic development, social integration, the preservation of cultural identities and the attractiveness of regions, they often disagree on the mechanisms underlying this impact. With regard to these mechanisms, Pecqueur (2005) emphasises the enhancement of territorial resources, Camagni (2008) refers to the enhancement of intangible resources and the role of innovation, whilst Boes et al. (2016) highlight the importance of digital evidence and smart technologies for the development of smart territorial systems. Furthermore, Verhoef et al. (2021) emphasise the importance of integrating organisational, technological and social systems to explain a territory's performance.

Although there is a wealth of international research on this subject, significant gaps remain. Studies often fail to construct an integrated framework for examining the impacts of digital transformation, the visitor experience, regional development and the attractiveness of the region. This gap is even more evident in Morocco, as in most African countries, and is particularly problematic in the field of quantitative research based on the modelling of causal relationships. It is therefore necessary to conduct research to develop theoretical models explaining the relationships between the digital transformation of museums, organisational capacity and constraints, the visitor experience, engagement and intention to act, as well as the attractiveness and development of the region.

This will lead into the final section of the literature review. It will provide a critical synthesis of the literature and outline the conceptual research model, identifying the main scientific gaps and proposing working hypotheses for the empirical analysis.

5.3. Critical Synthesis of the Literature and Identification of Research Gaps

An in-depth analysis of academic publications reveals the evolution of research into the digital transformation of museums. Early studies focused on the digitisation of collections, digital preservation and the construction of digital heritage databases. Gradually, various aspects of the transformation, such as organisation, experience, behaviour and space, have become subjects of research. This evolution illustrates the shift in focus from an approach emphasising technology towards a more holistic approach, where the use

of digital technologies enables the creation of various types of benefits for users, cultural institutions and regions.

The literature has initially highlighted a growing consensus on the importance of digital transformation for the evolution of museums. Parry (2013), Vial (2019), Verhoef et al. (2021) and Kraus et al. (2022) argue that the use of digital technologies goes far beyond the application of new tools, and involves a substantial reconfiguration of the organisational structure, the management system and the relationship with visitors. In the context of cultural heritage preservation, the use of digital technologies offers the potential to improve cultural mediation and institutional communication, as well as to enhance the organisation's overall efficiency. The authors agree that transformation is a complex phenomenon, but they focus on different aspects. They highlight the importance of elements such as organisation, leadership, innovation and digital skills.

Research shows near-universal agreement on the role that an organisation's capabilities play in the outcomes of digital transformation initiatives. The Resource-Based View (Barney, 1991) and Dynamic Capabilities (Teece, 2007) models stipulate that, in addition to appropriate organisational capabilities, an organisation's technological resources can foster a sustainable competitive advantage. This view is largely corroborated by studies focusing on museums, as a number of authors demonstrate that -leadership, governance and an organisation's capacity to learn, as well as its culture, have a direct influence on the success of a museum's digital strategy. However, there is a notable lack of research that addresses these dimensions concurrently, particularly with regard to heritage organisations in the Global South.

With regard to barriers to digital transformation, the literature shows almost complete consensus. Financial constraints, a lack of digital skills, resistance to change, inadequate technology and poor governance are the main challenges faced by cultural organisations, as described in studies by UNESCO, ICOM, Bellio et al. (2022) and Yang et al. (2025). However, this research is primarily descriptive in nature and often fails to propose models that attempt to quantify the impact of these barriers on the phenomenon of digital museology.

As regards visitors, the literature illustrates a parallel evolution. Early studies on museums focused on institutional aspects, using indicators such as visitor numbers or satisfaction levels. Current studies cover a much broader spectrum, including the visitor's experience and emotions, cultural and digital engagement, as well as behaviour. Falk and Dierking (2016), Pine and Gilmore (1999), Trunfio and Campana (2020) and Bec et al. (2024) agree that when digital

technologies enhance immersion, personalisation and the proactive role of visitors, they improve the cultural experience. However, the way in which these experiences relate to behaviour remains largely unexplained.

The literature on engagement and behavioural intention also demonstrates a close relationship with satisfaction. Relationship marketing models focus on satisfaction as the primary driver of visitor behaviour (Oliver, 1999), whilst more recent studies examine visitors' psychological engagement with the institution (Brodie et al., 2011; Hollebeek, 2011). Rather (2021) proposes an integrated perspective on experience and satisfaction that fosters engagement and subsequently generates intentions to revisit, recommend and remain loyal. Although some progress has been made, the simultaneous application of these models to digital museums has been very limited.

Research on digital heritage and territorial development points to the creation of second-order value that extends beyond the boundaries of the cultural institution. According to Richards (2018), Boes et al. (2016), Della Corte and Aria (2016) and various UNESCO reports, digital museums play an active role in a region's competitiveness in terms of cultural and sustainable development, as well as in the preservation of cultural identities and innovations. Nevertheless, these authors tend to study the effects of culture on the region without incorporating the variable of visitor behaviour into their explanatory frameworks.

One of the most significant shortcomings identified in the international literature is the separation between organisational, behavioural and territorial components. In studies on digital transformation, the focus is primarily on the organisational level of museums, whilst those on the visitor experience emphasise behaviour at the individual level. By contrast, studies on territorial development focus primarily on public policy, tourism and various economic factors. Very few studies offer an integrative approach combining all these elements within a single framework capable of explaining the value created by digital museums.

This is particularly true for the majority of African countries. The majority of global academic research is conducted in Europe, North America and Asia, where cultural institutions have abundant technological resources and digital strategies. There remains a research gap concerning African countries, which possess a rich cultural heritage and are undergoing radical digital transformations. This lack of research has led to the regrettable inability to apply the theoretical models developed in developed countries.

This scientific gap is particularly evident in the case of Morocco. The existing literature tends to focus either on heritage promotion, cultural policies, or the digital projects of the National Museums Foundation. Selkani (2021), Nabil and Moutaoukil (2024) and Ez-zahrani et al. (2024) document some of the progress made in Moroccan museums and the use of digital tools for the development of cultural tourism. These studies are primarily descriptive in nature and do not propose any frameworks for assessing the impact of organisational digital transformation on museum development, nor do they examine the interface between regional development and the visitor experience.

There is a second significant limitation concerning the research methods used in the literature. Firstly, there is an overwhelming predominance of qualitative studies and case studies, and the contribution of descriptive research is acknowledged. There is a significant gap in the application of structural equation modelling in studies on digital museums. However, the use of SEM is justified for analysing the interrelationships between a number of latent variables, focusing on direct, indirect and mediating relationships. These modelling techniques are useful for studying the relationships between digitalisation, an organisation's capacity, an organisation's constraints, the visitor experience, and the attractiveness and development of a region.

A critical review of the literature reveals four main research gaps. The first is a lack of comprehensive conceptual models of the digital transformation of museums that address the integration of technological, organisational, behavioural and spatial (territorial) dimensions. The second gap is the absence of research on African museums, and in particular Moroccan museums, despite the growing importance of the country's policies for the national digitisation of cultural heritage. Thirdly, the gaps in the literature do not sufficiently explain the relationships between visitor experience, engagement with culture, behaviour and regional performance. Finally, there is a general lack of use of quantitative approaches and, in particular, structural equation modelling, which limits the empirical grounding of the frameworks outlined in the literature.

These gaps provide a clear and strong case for this proposed research. Unlike other studies, which tend to analyse these variables in isolation, this research constructs an integrated conceptual model of the digital transformation of museums, as well as the capabilities and constraints of the organisation, the visitor experience, cultural engagement, behaviour, and the attractiveness and development of the region, all within the context of Moroccan museums. The aim is to provide a combination of theory and practice in the respective fields,

with specific recommendations for guiding cultural policy and the management of cultural organisations.

Conclusion

This systematic literature review has examined the growing body of research on museum digital transformation and its implications for visitor experience, cultural engagement, territorial attractiveness, and sustainable territorial development. The review demonstrates that digital transformation has fundamentally reshaped the role of museums, moving them beyond their traditional functions of conservation and exhibition toward more dynamic, interactive, and innovation-driven cultural institutions. Contemporary museums increasingly operate as platforms where technology, heritage, education, tourism, and territorial development converge to create value for both visitors and local communities.

The analysis reveals that digital transformation cannot be reduced to the implementation of technological tools alone. Rather, it represents a comprehensive organizational process involving strategic leadership, governance, organizational capabilities, innovation culture, and digital competencies. Technologies such as virtual reality, augmented reality, artificial intelligence, mobile applications, and interactive platforms provide significant opportunities for enhancing museum services; however, their effectiveness depends primarily on the institutional capacity to integrate them into coherent organizational and cultural strategies. Consequently, organizational readiness appears to be as important as technological investment in determining the success of digital transformation initiatives.

From the visitor perspective, the literature consistently indicates that digital technologies contribute substantially to improving museum experiences by increasing accessibility, personalization, interaction, and immersion. Enhanced visitor experiences positively influence satisfaction, strengthen cultural engagement, and encourage favourable behavioural intentions, including revisit intention, recommendation, and long-term loyalty. These behavioural outcomes extend the impact of museums beyond individual visits by creating stronger relationships between cultural institutions and their audiences. Digital technologies therefore serve not merely as communication tools but as mechanisms for enriching cultural participation and lifelong learning.

The review further demonstrates that the benefits of museum digitalization extend well beyond institutional performance. Digital heritage has become an increasingly important component of territorial attractiveness by improving

destination visibility, supporting cultural tourism, promoting local identity, and encouraging sustainable regional development. Museums are progressively recognized as strategic territorial actors capable of generating economic, cultural, educational, and social value through collaboration with tourism organizations, public authorities, universities, and local communities. This broader territorial perspective represents one of the most significant developments in recent museum research.

Despite these advances, the literature continues to present several important limitations. Existing studies remain highly fragmented, frequently focusing on technological innovation, visitor behaviour, or territorial development separately rather than adopting integrated multidisciplinary perspectives. Furthermore, empirical evidence remains concentrated in Europe, North America, and parts of Asia, while African contexts—and particularly Morocco—remain significantly underrepresented. Research on Moroccan museums has primarily documented digital initiatives and institutional reforms, but relatively few studies have investigated their organizational effectiveness, visitor perceptions, or territorial impacts through robust empirical methodologies.

This review therefore contributes to the literature by bringing together dispersed research streams from museum studies, digital transformation, cultural heritage management, tourism, and territorial development into a coherent synthesis. It provides a comprehensive overview of current knowledge, identifies the principal theoretical convergences and divergences, highlights persistent research gaps, and outlines future research priorities. For museum managers and policymakers, the review emphasizes that successful digital transformation requires integrated strategies combining technological innovation, organizational capacity building, visitor-centred service design, and collaborative territorial governance. Such an approach is essential for maximizing the contribution of museums to cultural sustainability, destination competitiveness, and regional development.

Ultimately, digital transformation should be understood not simply as a technological evolution but as a strategic process capable of redefining the relationship between museums, visitors, and territories. As digital technologies continue to evolve, museums will increasingly play a pivotal role in preserving cultural heritage while simultaneously fostering innovation, cultural participation, sustainable tourism, and inclusive territorial development. Continued interdisciplinary research, particularly within emerging cultural contexts such as Morocco, will be essential to deepen our understanding of these transformations and to support evidence-based strategies for the future of digital heritage.

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