

CULTURE ACCESS AND TECHNOLOGY

How can technology democratize cultural access?

Helena Isabel Machado Gaudêncio

Dissertation presented as partial requirement for
obtaining the Master's degree in Information Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação Universidade
Nova de Lisboa

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by

Helena Isabel Machado Gaudêncio

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Advisor: Vitor Manuel Pereira Duarte dos Santos

Co Advisor: Miguel Muñoz Duarte

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ABSTRACT

Technology has improved life in all its shapes, transforming the way we perceived culture. In the age of the digital culture, powered by social media and the advancements in Information and Communication Technologies, the world still faces barriers in a fair and equal cultural access. This study proposal intends to provide the basis to sustain a further study into how technology can help transform how individuals access cultural creations. Through a deep study of the difficulties faced in cultural access nowadays, together with the knowledge of the power and capabilities of recent and emerging technologies, it is proposed the creation of an artefact that will help decision-makers in addressing such issue.

KEYWORDS

Information Systems; Culture; Technology; Culture accessibility

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1. INTRODUCTION

1.1. BACKGROUND

Throughout the years, cultural access and participation has been a privilege restricted strictly to some minorities of more privileged classes or at least restricted to their rules and tastes since until the early twentieth century most of arts and culture investments were made through patronage and philanthropic donations from the higher classes (Mulcahy, 2006). It became the role of the government to provide regulations to ensure the democratisation of culture, ensuring that even the less wealthy classes could have access to significant cultural creations, creating a centralised model of cultural dissemination, responsible for making culture accessible to everyone in the network (Evrard, 1997).

Culture itself and its artefacts have been evolving, now comprising also media artifacts and the concept of digital culture, that results from the effects of digitization and developments on Information and Communication systems in such a way that it altered our participation in culture in all its levels: how we create, distribute and own content (Lavender, 2010). According to Gattinger (2010), it is crucial that the decision-making process to achieve cultural democratization bases itself in collaboration and coordination, not only due to the different agents present in the process, but also in consequence of the fast-paced social and technological change, that has led to the emergence of new publics and very diverse forms of culture creation.

1.2. MOTIVATION

However, the question of how to achieve this collaboration and coordination remains, with the entities involved in the process of decision-making lacking most of the times the necessary knowledge in terms of which technologies are available and how they can be applied.

To approach the relationship between technology and culture we need to include a broad range of subjects, we can study the impact of technology on culture creation, and vice-versa, how the several areas of cultural creation can be transformed in the future, but also how can we use technology to facilitate the access to the culture that exists across the world. Access implies that everyone has the choice to consume culture and its goods, in all its forms and genres, according to their tastes and preferences, therefore it means we should focus on providing access to new audiences, this is previous non-consumers of culture due to constraints in place (Access to Culture – Policy Analysis Review on the Policies at European Level, 2013).

While studying the democratisation of access to culture, it is crucial to understand what progress has been achieved, since this is one of the main areas of concern from cultural policy, mainly approached by governments from the right. This way we can understand which problematics present a more significant concern, that can be solved through technology.

Even in this subject, we can subdivide our study into making culture accessible to the common public across geographical boundaries, this is, how can we proportionate to someone in Asia the experience of visiting a museum in the US. Or, how can we transform how people access the cultural and historical inheritance in the world, changing the way people interact and deal with culture, such as instead of a war museum we could recreate history through virtual reality, or even how can we make people with

disabilities have access to all forms of cultural creation, how can a blind person appreciate the beauty of the well-known Mona Lisa?

The easiness of access in the developed world to culture, and consequent translation to criticism and reactions to what is presented, allowed for an increase in speed in the evolution of cultural goods and mediums, this together with the development of mass consumption and production, led to an increase in demand for these goods, with higher engagement from youngsters, and higher rates of change of tastes, values or what is cool in the moment (Pratt, 2007).

It is becoming more relevant in society and for individuals, the consumption of culture, shaping their identities, proved by an increase in the expenditure in the sector (Pratt, 2007). Therefore it is relevant to guarantee that no one is left behind in this upspring of cultural consumption.

1.3. OBJECTIVE

The main objective of this study is to create an artefact, more specifically, a framework that facilitates the choice of cultural decision-makers regarding which technologies to use in order to achieve the different targets of cultural access and creating the conditions to increased participation. With the current speed of change, new technologies and developments occur at an unseen rate, making it challenging to keep up with all the new possibilities created. The objective is to make an easy read tool, that provides succinct and concrete information in which technologies to apply to solve each of the different problems that government entities and cultural businesses can face, while trying to achieve a new way to diffuse culture, being more inclusive and embracing in its communication and distribution.

2. LITERATURE REVIEW

The literature review is divided into two phases that correspond to the two axes of the framework we intend to create as output of this study, first we will start by exploring Culture and the related concepts, from this study we will obtain the list of cultural assets to consider in terms of access, as well as the problematics in culture accessibility that we intend to solve with technology. In the second stage, the literature review will focus the technology side, to understand its historical and present relationship with culture and how the current state-of-the-art technology and future developments may impact even further the access to culture.

2.1. CULTURE

2.1.1. Concepts

2.1.1.1. Culture Definition

Culture is one of the most complicated words to define, its meaning depends on the context it is being applied, but even in the same context, it can have different connotations. Therefore, we must start by presenting our understanding of culture for the context of this study.

Culture surged in language to refer to the tillage of the soil, in the 16th century it was associated to the cultivation of the individual, in terms of mind and intellect, use that prevails to these days, to refer to someone that is well versed in arts and letters. In the 19th century, a broader connotation was added, culture as “the intellectual and spiritual development of civilisation as a whole”, expanding to represent how people live in a society (Throsby, 2001).

Throsby (2001) considers two definitions for culture, the first from a sociological point of view, corresponding to “a set of attitudes, beliefs, morals, customs, values and practices which are common to or shared by any group”, this may translate into “signs, symbols, texts, language, artefacts, oral and written tradition”. The second approach refers to specific activities and its products, related to the intellectual, moral and artistic aspects of life, the cultivation of the mind.

Based on T.S. Elliot (1962) definition of culture as “the development of an *individual*, of a *group* or *class*, or of a *whole society*”, we can observe three levels to define culture, the last two correspond to the definitions used by Throsby (2001), this author, however, does not emphasize the development of the individual as a meaning of culture.

We will be referring to the third notion of culture, the development of the society, the one related to the production and creation of cultural products. This definition by itself highlights the importance of culture and the equality of opportunity in accessing it, contributing to the societal development as a tool for social integration through the work of creation and reinforcement of cultural identity (Vilar, 2007). As such there is a need for the governments to support the cultural sector, either in the creation, distribution and access, since there are positive externalities for society as a whole, making culture too relevant to define it solely based on economic concepts of demand (Vilar, 2007).

2.1.1.2. Cultural Products

The introduction of the concept of cultural products requires the existence of rules to classify what can be comprehended under this label. David Throsby (2001) suggested three criteria that need to be met: involve creativity in their creation, communicate or create some symbolic meaning and the outputs of these activities should be liable to intellectual property rights.

Considering the definition of culture presented and the criteria to be a cultural product, culture will then include the traditional or fine arts such as music, literature, poetry, dance, drama, visual art, but also, filmmaking, storytelling, festivals, journalism, publishing, television and radio (Throsby, 2001). Other classification systems such as “UNESCO Institute for Statistics Model” or “Americans for the Arts Model” can go to include, in some level of their classification, areas such as software, computer games, fashion, design, advertising, with different systems dealing with these categories in different manners. We will exploit the categorisation of cultural products and services in more detail in section 2.2.1. Cultural Assets.

When thinking about culture, arts are commonly referred to as a synonym, since until as late as the '50s, it was what society mainly regarded as cultural products. Adorno and Horkheimer came to bring the concept of cultural industries, due to the commodification that cultural products were suffering and their loss of significance. We still use the term nowadays but with a more positive connotation, according to Garnham (2005), the term cultural industries, from the Frankfurt School had in its initial times, an elitist feeling, this new concept did not respect culture at that time, restricted to the fine arts, a high level of culture, that was being lost due the massification of cultural production (Garnham, 2005).

Cultural industries are characterised by activities that allow the creation, distribution and commercialisation of cultural goods and services (Vilar, 2007), is associated with mass culture, the capability that the industrialisation of culture brought of mass-reproduction and mass-distribution of cultural goods (Study of the Economy of Culture in Europe, 2006).

The developments of culture across the years, lead to the need to distinguish a broader term, the cultural sector, that encompasses the cultural industries and the non-industrial sector, which mainly comprehends the art sector, which refers to cultural goods and activities for consumption on the spot (Study of the Economy of Culture in Europe, 2006).

In *Bastard Culture!* (Schäfer, 2011), there is a mention to another type of cultural creation that derived from the increasing technological development and digitisation of live processes, labelled as participatory culture which can be seen in cases such as social networks, where the notion of creator and consumer blurs itself, increasing participation. This way the new media enabled, not only more extensive access to content but also a new form of cultural participation that it is crucial in shaping the current information and knowledge society.

2.1.1.3. Cultural Spaces and Agents

Besides comprehending what culture is, it is also relevant to understand how we can relate with it since it occurs in a dynamic relationship between space and agents. There are four ways in which one can relate directly with culture, either through cultural creation, cultural expression, participation or reception of culture (Costa, 1997). In short, we can create or consume culture in a dynamic relationship that has been evolving with the development of Information and Communication Technologies (ICTs). Cultural participation refers to a more active form of cultural consumption, that relies on the

engagement of the individual to attend cultural events or infrastructures such as museums, while reception refers to a more passive way of consuming culture. It is what we are exposed to through the media (Costa, 1997).

Culture has several social spaces associated, with different levels of legitimacy and acknowledgement, José Madureira Pinto divides them into five spheres: the space of high culture, the space of cultural industries, but it also expands to less institutionalized areas, such as the organized space of subcultures, mainly regarding activities of associations, the collective space and the domestic space (Costa, 1997). These spaces comprehend both the consumption and the creation of cultural assets, comprehending all levels and sources of culture.

Besides understanding the types of relations and spaces of cultural affirmation, it is also valuable for our study, to understand who the cultural agents are, and how are the dynamics in the cultural sector. First of all, there are two sides: the state, divided into its layers of power and competencies from the local to the national, and the civil society, a very diverse group, which includes all the players from cultural enterprises to foundations and associations, informal groups and amateur and mediating agents. The cultural activity mostly results from a network association between several of these agents, and despite the importance of these partnerships, Augusto Santos Silva affirms that the state should always be the main responsible for providing structural services and activities to the public (Costa, 1997).

Despite its recognized importance in terms of policy, it was only in the middle of the 20th century that the arts and culture created interest in the economic sector, and the field of the economy of culture surged, however, this market demanded a different approach from all the others that economists were used to, due to the diversity, uniqueness and rarity of the goods considered (Vilar, 2007). These characteristics make it difficult to evaluate the value of such goods, much due to the change of the nature of culture, that got further away from the canons that lead the field of fine arts, now the value of cultural goods depends on a variety of agents, and from the circumstances in society (Vilar, 2007).

In *The Urgency of Theory*, Pratt quickly sums up the main dualities in cultural activities, in all its fronts: “cultural and creative, commercial and non-commercial, formal and informal economies, and across production and consumption”, that give us an outlook of how diverse and complex the culture world is nowadays.

2.1.1.4. Cultural and Creative Industries

The concept of cultural industries is a relatively recent concept, that arise due to the growth of the bourgeoisie, and posterior increase in access of the middle class, representing an increase in the demand side, which dictated the evolution of cultural creation and diffusion, supported by the surge of technologies that allowed the reproduction and distribution of cultural goods in mass scale (Vilar, 2007). This evolution created an unprecedented easiness of access, also supported by the increased levels of patronage to cultural events since it is becoming more common to have cultural events as part of marketing strategies of companies, politics and sports (Vilar, 2007).

Cultural industries, in the economic view, have two main features: “high fixed costs of production and low to zero marginal costs of reproduction and distribution”, these characteristics favour “economies of scale, audience maximisation and both vertical and horizontal concentration” (Garnham, 2005). These concepts were remarkably important during the regulation of broadcasting and the discussion

about the need of public services to offer cultural products and services, focusing the economic and political discussions of culture in the change of access and distribution.

Nowadays, we have seen a shift in cultural policy, evolving from focusing in the cultural industries to target now the creative industries, which, according to Garnham (2005), arise due to the information society in which we live today, from the changes that the development of information and communication technologies have created in the way we live, work, learn, and can only be applied in this context, representing more than a change in nomenclature.

Previously in the UK, there were two main areas of concern: the arts, on principles of patronage, and the mass media, to provide popular culture, both with focus on the distribution and consumption (Garnham, 2005). The creative industries broaden the scope to the level of including the software sector, and bringing the focus back to the creative worker, an artist-centred approach, with four critical strains presented as “access”, “excellence”, “education” and “economic value”. This concept was introduced in 1998 in the UK, propelled by this desire to shift from a policy where the state provided culture with focus on distribution and access under the previous scheme of cultural industries, to one where the market was responsible by the supply side, and public spending in the area should be viewed as investment (Garnham, 2005).

If we think about the relation between these two types of industries, cultural industries are a part of the creative industries, since these two concepts are inseparable, to have any artistic or cultural production, creativity is a requirement (Einarsson, 2016), such that according to Throsby (2001) one of the requirements to be classified as activities and products of culture is that it indeed involves creativity in their creation. However, going from cultural to creative industries is the most significant change we have seen, with governments showing the will to part from a view of the high arts to this new world of information and knowledge.

In fact, in 2006, a first approach to study the culture economy in Europe, and define its scope, was attempted, and resulted in a centric classification of the sectors and activities encompassed, divided in 4 main areas: the core arts field at the center, the older concept of culture, then the cultural industries in circle 1, followed by the creative industries in circle 2. Additionally, it was also considered a third circle to explore the development of related industries, such as cultural tourism (Study of the Economy of Culture in Europe, 2006). This enlargement from cultural to creative industries makes sense by analysing consumer behaviour and the economic foundations of our society in the present. One significant change is that the consumer is now, not only available to pay premiums for specific characteristics in products or services, as in fact, they demand a diverse supply, people are no longer satisfied with one model in one colour (Pratt, 2007), in the current service economy, this allows companies to sell more than their end product, they sell the design, they sell the experience, and this implies the input of a new class of workers, the creatives.

2.1.2. Cultural Assets Classification

When analyzing the concept of creative industries, we referred that there were several different models of classification of creative and cultural industries, depending on the entity or country that created it, this complexity regarding the study of European cultural policy, can be explained by public policies heavily dependent on history and tradition, influenced by the politic ideology and the cultural movement prominent at the time of definition (Santos Silva, 2003). The influence of these factors

implies that different countries have a different basis for constructing their current classifications, with no right or wrong approach.

However, there are powerful cultural policy currents due to the crucial impact of some countries in the development of culture. In Europe, France and the UK were the leading influencers, however, with the creation of the European Union, whose policies are influenced by others, new authorities and policymakers appeared in the sector, such as the European Council (Silva, 2003), that now influences the cultural policy of its member states. Before this, we already had UNESCO, which is the most prominent authority worldwide relating to cultural policy and initiatives.

The consideration of design in these frameworks is highly influenced by the consumer behaviour, that nowadays has made the design to be a real competitive advantage, much associated with identity and culture definition of the individual (Pratt, 2007). Cultural consumption is now more prevalent, becoming a key factor for countries looking to attract foreign investment since the creative workers want to be in the epicentres of cultural activity and value it as a life quality criterion (Pratt, 2007).

As pointed by Colbert and Courchesne (2012) and Olivier (2009), one key fact about current cultural consumers is their eclecticism and consequent diversity in consumption either in the form, genre or current of cultural products and services. As such, it is relevant to approach the study of democratisation of access for a broad range of products, not only focusing on the old concept of high culture, the main scope of cultural policy.

To define the cultural assets we will study, we will use the classification frameworks of the leading institutions, as well as the frameworks created for the harmonisation cultural statistics. In the “Creative Economy Report” (UNESCO, 2013) we have an overview of the main models to classify cultural and creative industries represented in Figure 1.

In a study from the EU in 2006, another circular framework had already been created, with a core arts field englobing Visual Arts, Performing Arts and Heritage, the cultural industries represented by Film and Video, Television and Radio, Videogames, Music and Books and Press, and finally the creative industries represented by Advertising, Design and Architecture. A fourth looser and broaden circle is mentioned referring to the manufacturers of technologies and hardware crucial to support the other industries.

We can see that despite considering mainly the same sectors, with different nomenclatures or aggregations, the basis of classification in the models is relatively different, with different levels of granularity, leading to different classifications of the same sector across models.

1. DCMS Model		2. Symbolic Texts Model		3. Concentric Circles Model	
Advertising Architecture Art and antiques market Crafts Design Fashion Film and video Music Performing arts Publishing Software Television and radio Video and computer games		Core cultural industries Advertising Film Internet Music Publishing Television and radio Video and computer games Peripheral cultural industries Creative arts Borderline cultural industries Consumer electronics Fashion Software Sport		Core creative arts Literature Music Performing arts Visual arts Other core cultural industries Film Museums and libraries	Wider cultural industries Heritage services Publishing Sound recording Television and radio Video and computer games Related industries Advertising Architecture Design Fashion
4. WIPO Copyright Model		5. UNESCO Institute for Statistics Model		6. Americans for the Arts Model	
Core copyright industries Advertising Collecting societies Film and video Music Performing arts Publishing Software Television and radio Visual and graphic art Partial copyright industries Architecture Clothing, footwear Design Fashion Household goods Toys		Interdependent copyright industries Blank recording material Consumer electronics Musical instruments Paper Photocopiers, photographic equipment Industries in core cultural domains Museums, galleries, libraries Performing arts Festivals Visual arts, crafts Design Publishing Television, radio Film and video Photography Interactive media Industries in expanded cultural domains Musical instruments Sound equipment Architecture Advertising Printing equipment Software Audiovisual hardware		Advertising Architecture Arts schools and services Design Film Museums, zoos Music Performing arts Publishing Television and radio Visual arts	

Figure 1: Classification systems for the cultural and creative industries (Vickery, 2013)

In the statistical side, the ESSnet-culture (2012) considered ten cultural domains: Heritage, Archives, Libraries, Book & Press, Performing Arts, Audiovisual & Multimedia, Architecture, Advertising and Arts Crafts. This framework is an attempt to create a unique approach in the study of cultural statistics, basing itself in the 2009 UNESCO Framework for Cultural Statistics and in the one that resulted from the 1997 meeting of the Leadership European Group on Cultural Statistics (European Statistical System Network on Culture, 2012). This framework predominated in field of cultural statistics in Europe, as it was the theoretical basis for the “Guide to Eurostat Culture Statistics” (2018), a complete study in cultural statistics regarding the EU.

Due to the authority of UNESCO in cultural matters, we will also analyse their statistical framework from 2009, represented in Figure 2. The most evident difference is the inclusion of natural heritage in sector A and transversally to all domains the inclusion of intangible cultural heritage.

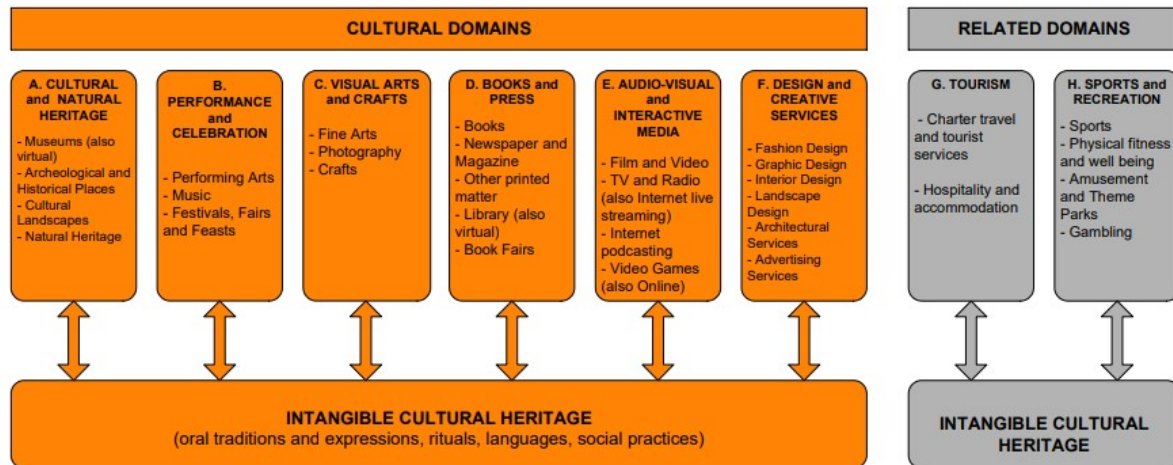


Figure 2: Framework for cultural statistics domains (UNESCO, 2009)

The definition of cultural assets is something complex, but with all the evidence that has been studied it is clear that in our scope we exclude the concept of participatory culture as cultural creation (Schäfer, 2011), as well as the areas that were brought to the cultural field with the rise of the creative industries, such as design, software.

From Figure 2, in broader domains, we should exclude “F. DESIGN and CREATIVE SERVICES”, despite advertising and architecture being included transversally in most of the frameworks referred before, since these are cultural services that mostly serve commercial and creation purposes, that may not lead to a cultural output (‘The 2009 UNESCO Framework for Cultural Statistics (FCS)—UNESCO Digital Library’, 2009). Due to our definition of culture, that regards the creation of cultural products and services, and in coherence with the remaining frameworks, we should also exclude natural heritage. Intangible heritage, due to its nature, should also be excluded, since it is not controlled or supported through cultural institutions that could employ our framework of recommendations. All the sectors referring to technologies itself or hardware should also be excluded, because in this case, we enter in the domain of ICTs accessibility, out of the scope of culture access, this excludes categories such as Internet, Software, all the hardware and equipment, as well as videogames, that despite being a product, to change its accessibility is also a matter of designing inclusive technologies.

2.1.3. High Culture vs Low Culture

The duality between levels of culture comes a long way from the past, and if initially, the distinction was clear, with high culture being the one provided by the state (comprehending mainly the fine arts), nowadays it is becoming more complex to make such division (Pratt, 2007). In this discussion, it is fundamental to keep in mind that this categorization is specific in time and geography, according to the cultural development existent (Pratt, 2007), with jazz, photography and cinema being at a certain point considered low forms of culture, which would not occur in the current standards of culture. This shows how much this classification is ingrained in the human tendency to classify culture and art forms based on our assumptions at the time of the character and intellect needed to appreciate the different genres and mediums (Fisher, 2005).

One association that we tend to do when we hear the terms high and low art, is the duality of good and bad, however this is already another level of distinction, that erroneously we tend to mix in the

discussion, attributing merit due to the form (Fisher, 2005), which is a dangerous generalization. Another way to make this distinction is the use of the term popular culture instead of low, making an association with the arts and forms of the people, in a less pejorative way, but it also raises other duality, the elitism versus populism views, pressing the value of the high arts against the value of cultural diversity (Mulcahy, 2006).

Another essential association in this context, is between the popular art and entertainment, by default, anything that is created with the objective of entertaining will be more straightforward, more readily comprehensible by the masses, to originate sensations of pleasure and fun (Fisher, 2005). This reminds us of the concept of mass art/culture and tends to attract critics that consider it inferior to the genuine canons of art. However, Fisher believes that the next big move in the arts field will be to integrate the lower levels, targeted to the masses and for entertainment.

The distinction between high and low culture is broader than the one in art, and we should consider the notion of taste as key for the public formation for the different forms and mediums of art and culture, depending on the values and socioeconomic status of the individual (Cohen, 1993), but despite the terminology used “high” and “low”, again we should not jump to the judgement of quality between them, since this would imply that someone that consumed high culture would never appreciate any low culture. This distinction could be applied to classify both genres of art or pieces of work within a form or medium (Fisher, 2005).

Fisher (2005) gathers the views of several authors to transmit us a broad and complete view of classification and criticism of the two levels of arts, and while all of them recognize the existent division, there are different position regarding the stated differences in value and even the negation of these differences in values and aesthetics, stated as an artificial social convention that serves political and moral interests of the higher classes. The pluralism of positions and theories make it easy to understand that there is no straightforward way to approach this subject. It can be claimed as a way of conditioning access to higher forms of culture for the lower classes and conditioning the perception of the cultural forms created by lower classes, this way this discussion goes almost out of the scope of culture in itself, but foremost approaching the notion of democracy and freedom of speech, cultural production and diffusion of ideas.

In Colbert and Courchesne (2012) literature review, they try to evaluate the key points to market cultural goods to current consumers. This provides us with insights about the nature of consumers, that point towards more significant diversity in terms of social classes, and with broader patterns of consumption, diminishing the relevance of the distinction between only high and low culture, enriching the analysis with an axis of contemporary and classical or even favoring other distinctions such as the intensity and diversity of cultural consumption, and contrary to what others feared, this does not point towards the destruction of the high culture appraisal, just to a more eclectic consumption of culture, favoured by the new media that allow the surge of new cultural forms but also its easy and quick transmission. Schäfer (2011) argued that the emergence of this new media practices, together with the information technologies, could lead to the desired social progress and to a shift in how people participate in democracy, businesses and interact with each other.

Ollivier *et al.*, (2009) analyzed the evolution of cultural consumption in Quebec’s population, between 1979 and 2004, and confirmed the hypothesis of the decrease in consumption of high culture, in this case classified as highbrow consumption, in all classes of society, even among the ones with higher

cultural capital, going along with the trend of increased openness and tolerance that lead to the rise of a movement of cultural eclecticism, more observable in dominant classes. This means that people nowadays tend to have a more diversified consumption of culture, either in its form and genres, and this is more likely in people with higher cultural capital, therefore decreasing the engagement with the privileged forms of culture, that represented the primary consumption of this group.

2.1.4. Access to Culture – Democracy and Culture Accessibility

Culture has been ruled in a complex system of multilevel governance, comprehending several policy levels in the government, and private actors, either businesses or non-profits (Gattinger, 2010). Initially, it was restricted to an arts policy which corresponds to support museums, visual arts, performing arts, historic preservation and humanities program, but a genuine cultural policy implies a broader scope of action supporting other types of institutions such as libraries and archives, gardens, aquariums, and other festivities belonging to the popular culture, such as festivals, and other demonstrations from folklore activity (Mulcahy, 2006). All of this should also encompass support to education, working side by side with cultural policy to promote its consumption and the engagement of individuals since early in life.

It is a belief that giving autonomy for cultural activity can be sufficient to fight the tendency of current societies to dismiss themselves from civic activities (Pinto, 1997). However, the author refutes this argument, implying the necessity for structural reform of the institutional conditions of cultural creation and diffusion. Since through economic forces, most cultural goods are classified as public goods, and therefore the state needs to intervene to guarantee the supply of such goods (Pratt, 2007). Intervention by the government is crucial due to the importance of culture in shaping society and the individual, associated with the concept of creating a civic identity (Mulcahy, 2006).

Only in the '90s, we observed the change in paradigm in cultural policy (Volkerling, 2001), with a shift from arts policy to the acknowledgement of the creative industries, mainly recorded in Europe, with the recognition of culture as a policy domain in 1992 (Pasikowska-Schnass, 2017). This change came as a move of acceptance of the new reality in cultural terms, to which mass media belongs, and it is not worthy of keeping ignoring its impact and relevance in the life of everyone.

2.1.4.1. Historical Overview

Democratization of Culture and Culture Democracy

José Madureira Pinto (1997) emphasizes the need of an adequate cultural policy to have cultural democratization, which is only possible through the incorporation of the aesthetics and intellectual values in the population, based on 4 pillars: preserving, valuing and making available the existent cultural assets and equipment, and through a consistent policy of gathering public. To do this, it is necessary not only to get the culture to more people, increasing accessibility, but the author also emphasises the importance of democratising cultural production, diminishing the distance between cultural creators and consumers.

One of the oldest strains of cultural policy, is to promote the democratization of culture in terms of access, focusing the fact that high culture should not be restricted to higher classes, however this type of policy usually fails in recognizing the existence of other levels of culture and tastes, imposing on the

consumer the choices of the ruling classes (Mulcahy, 2006), and it is one of the main pillars of cultural policy in Europe (Evrard, 1997), based on the dissemination of the classical canon of a work of art.

According to Evrard (1997) this type of policies failed in its objectives, never being able to erase the gap in consumption for individuals with different levels of income and education, this then leads to the surge of the concept of cultural democracy, that intends to give a voice and opportunity to the consumer to set their own preferences in terms of culture.

However, we already observed a considerable evolution in culture accessibility with the industrialisation of culture, mainly felt after the war, that transformed cultural goods to become more like all other goods in the market, with the creation of publics and distribution networks (Vilar, 2007). The cultural development that occurred in the last decades, is making the life of cultural decision-makers more complicated, in terms of deciding which forms to support and how (Pratt, 2007), to surpass this challenge we based our decision for the which in the current frameworks of cultural and creative classifications more widely used in Europe, and the how is based on the assumption of providing equal access to everyone, we don't intend to transform how culture is diffused but to make sure it achieves equality in access, due to its importance on the social development, both direct and indirectly (Pratt, 2007).

The future of cultural policy, according to Mulcahy (2006), as one that will be better accepted by the public, would encompass "the humanities, historic preservation, public broadcasting, and arts education", emphasising that in above all, the cultural policy should not depend on profit and commercial motives. The author also notices the importance of having public policy complementing the efforts of the private sector, which are becoming increasingly dominant in the cultural sphere, but that have their choices driven by profit. Therefore they may not have the right incentive to address the issues of culture accessibility that we consider in this study.

Mulcahy (2006) defines the criteria for cultural democratisation as equal access through different geographies, socioeconomic classes and educational levels, validating the choice of the problems we want to tackle.

This two paths in policy lead to different interventions from the state in culture, in democratization, the government acts as the supply side, affecting directly what is created, and what is made available to the public, in cultural democracy, it has almost no power in dictating the content, its function is to ensure that all types of culture have the same support to be developed and reach the consumer (Evrard, 1997), "the market structure needs to be varied enough to respect taste diversity and satisfy each segment of taste", which is an entirely different meaning for equality, that in democratization is represented by having a distribution of spectators similar to the distribution of society. The dichotomy between the top-down approach of democratization and the network approach of cultural democracy, brings another discussion on what the focus of cultural policy should be, bring knowledge to individuals, or entertain them (Evrard, 1997), however, this distinction between the gains and value of high and low arts is becoming more questioned over time.

Augusto Santos Silva summarizes cultural policy in three types of policies: the charismatic cultural policies, to support the recognized creators; policies of cultural democratization, enriching the first with the focus of access to culture for everyone; policies of cultural democracy that add a third layer that stands for the enlargement of cultural expression to all social groups and stimulate their creativity (Costa, 1997).

In an era of cultural diversity, easy access to new content, and where a plurality of tastes is becoming dominant it is somewhat limiting to define the success of culture access through a public representative of society. In the context of our work, we are indeed trying to improve access to culture, addressing specific problematics, but not excluding any work or form, due to differences in value or objective. We propose technologies to democratize the access to culture, but we consider scope of culture, from a cultural democracy point of view, without underestimating culture due to visions of having less value or having a less noble objective for the individual, following one of the recommendations from the European Council in 2011, to digitize and enable access to both cultural heritage, the said high culture, and the contemporary cultural products, usually included in the low culture, while respecting cultural and language diversity (Access to Culture – Policy Analysis Review on the Policies at European Level, 2012).

Access to Culture

Access is a fundamental human right, that can be defined as the capability to choose to enjoy and participate in culture and arts, that is influenced by a mix of “practical, physical, social and cultural” factors (Moore, 1998), therefore it should focus on identifying the underrepresented groups and address policies to ensure equality for them (EU, 2015). In the study “Access to Culture – Policy Analysis” (2015) three main areas were identified regarding culture and its relationship with democracy: people capability to participate, erasing discrimination and barriers to access, and freedom of choice in consumption and production. In our study, we focus on the second one, wanting to fight and eliminate barriers to access, focused on characteristics of different population groups (Pasikowska-Schnass, 2017).

Throughout the years, we could see culture and its institutions working as a dynamic of political and social power, and that shows up in today’s cultural access and participation, as social classes got more power, they become more demanding of their representativity in culture and in the access to cultural institutions (EU, 2015). There was also an evolution from the focus only on access to the democratisation of representativity on the supply side. However, the focus on European cultural policy remained to be the concept of access and allowing everyone to enjoy from the current cultural offer, with one of the key metrics for cultural institutions to secure public funding being the number of visitors. However, the technological shift, brought by the new media, came to reframe the way access could be achieved and even originated new cultural spaces, allowing for cultural production and distribution at an entirely new level (EU, 2015), without, however, achieving the desired change and heterogeneity of the consumers.

In the EU, the starting point of cultural policy mainly focused access in terms of internationalization and relationship with the outside, later started to focus on education for arts and culture, and only in 2010 there was a focus to study and evaluate best practices “to promote better access and wider participation in culture”, focusing on bringing new audiences, that faced barriers that exclude them, specifically younger audiences and the economically disadvantaged. In the last years, a stronger emphasis has been given to the digitisation of culture and all the potential this can bring to increase access and participation. In France, one of the most determinant countries in terms of cultural history in Europe, a study regarding consumption patterns shows that the results in 2008 were even worse than in 1973 (Martin, 2013), with individuals participating less and several activities showing apparent differences in consumption by the several social classes, even after several decades of cultural policy

towards the democratization of culture and cultural democracy, enforcing that this is still a relevant problem, even in countries with historical importance in the cultural sector.

According to the Special Eurobarometer 399 (2012), the three main factors for not participating in culture in the EU27 were “lack of interest, lack of time and too expensive”, with a particular emphasis on the first two, that corresponded to the main reason for all the categories analyzed. However, categories such as ballet, dance or opera were mostly dismissed by lack of interest, such as libraries and the theatre. On the media associated with mass culture, such as books, cinema, and Tv/radio, the main reason was lack of time. This may represent the lack of cultural capital to effectively value several types of cultural goods, people with less education were more likely to say they didn’t have interest in an activity, while people that work and that have higher levels of education are more likely to state lack of time.

2.1.4.2. Problems of Access

Socioeconomic Status

Regarding socioeconomic status as a problem of access, we should take into account the full effect of such in an individual and their relationship with culture: the lack of socioeconomic resources implies both economic resources, income, and it is the part that we tend to focus on, but there is also the cultural capital, usually observed as the education level of the individual (Ollivier *et al.*, 2009), both these factors are limitations in the access to culture. On one hand, a lower socioeconomic status translates into less income, that limits the access to paid cultural events, services and artefacts, with an overlap with the geographical problem, since less income means less propensity to spend money to travel and overpass this problem. This becomes a bigger issue in times of crisis since culture and entertainment are the first areas where people cut costs, as well as the governments. This is even more relevant when we consider the fact that most of the funding goes to high culture (PasikowskaSchnass, 2017), therefore privileging the ones that already have fewer barriers to access.

On the other hand, it can also translate into lower education levels, that can difficult the access and participation in culture, a study to access the attendance to museums and galleries in London concluded that people with higher qualifications had much higher probabilities of attending this type of institutions (Brook, 2016). A clear example of this is that even regarding culture-talk, there is a set of linguistic conventions that dictate how the fine arts should be evaluated (Lizardo, 2016), that has been extended to popular culture areas, such as films, creating a cleavage, excluding people from even knowing how to talk about the subject. An interesting result from the study of Lizardo is that regarding the engagement in culture talk, education levels actually have a higher effect on it, than income levels.

Moore (1998) made an assessment of factors that lead to the inequalities in access to arts due to poverty, based on previous statistics that show that in fact, these people tend to have lower access and participation, but most analyses tend to focus only the two criteria we already mentioned: income and education. In his study, the objective was to understand why this happens, and the truth is that they don’t relate to this type of content, associating arts as a subject for the rich and showing a lack of knowledge about what arts englobe, in fact, it is not only costs that limit the access of this group. Besides that, there are limitations in accessing the venues, on having availability to go, either because they have kids to care for or harder work life, but one of the less evaluated problems and very relevant in this case is the lack of familiarity with the venues, with the art forms itself, people don’t know what

to expect, face discrimination when entering this scope of the cultural life and complain about lack of accessible locations and information about the events.

This problem may be more evident or create more concern, in some forms of art, a limit example would be performative arts, specifically live shows. In these conditions, to have a higher quality show, implies the hiring of better artists, or a better venue, between other improvements that can be made, but that in the end, all lead to the same problem: prices increase. This will ultimately result in serving richer audiences (Vilar, 2007), making it necessary to have state or patronage support, in order to make the events accessible to a larger audience, however this result is often not achieved in practice.

The existence of culture stratification can be studied through several approaches, Lizardo (2016) chose to deepen the effect of how cultural knowledge is distributed and applied in the context of social interactions, achieving the same stratification presented in previous studies regarding audience segmentation, however an interesting conclusion arise, when considering people with equal levels of cultural engagement, the effect of education in culture talk is even more notorious, which means that even between people that interact regularly with cultural activities and goods, the ones with more education are more likely to talk about it, leaving the question, are the less educated less capable of talking about it? Or just less interested? Or perceive less value on what they see? But clearly there is a gap here, that can likely be attributed to the intellectualization of speech in the cultural sector. This is even more obvious when we consider that Lizardo also concluded that the ones that engage more regularly with fine arts are more likely to engage in culture talk in all cultural domains.

Disability

To approach the problem of disability in cultural access, it is necessary to first define what is the scope of disability we are considering since this is also not a straightforward subject. The World Health Organization (WHO) has been studying the subject and created a framework that intends to standardize the study of disabilities, the data and the language used, The International Classification of Functioning, Disability and Health (ICF), which we will use in this study.

The ICF combines the two main models for disability, the medical and the social (WHO), in the first one disability is a characteristic of the individual that requires medical treatment, in the second, disability is a problem created by society, that is not capable of accommodating the needs of certain individuals, and this view requires political actions. From this, it surged the “bio-psycho-social model” that integrates both models for a holistic approach to such a complex problem, comprehending both the concept of disability that corresponds to lack of functioning that result from both the health needs and the and the environmental and personal factors, this is the context of the person. From this view, we can develop to an analysis of capacity and competent performance, this is, the context and especially the environment, can limit the ability of a person to perform in their daily life despite having the ability to, so we want to study how we can use technology to work as a facilitator for disabled people to achieve their maximum capability in cultural access and consumption.

In the Convention on the Rights of Persons with Disabilities, Article 30 refers to the right to “Participation in cultural life, recreation, leisure and sports”. In point 1 that focus the consumption and access to culture, it is stated that people with disabilities should be able to have the same cultural life as others, reinforcing the right to “a) Enjoy access to cultural materials in accessible formats;”, “b) Enjoy access to television programmes, films, theatre and other cultural activities, in accessible formats;” and “c) Enjoy access to places for cultural performances or services, such as theatres, museums, cinemas,

libraries and tourism services, and, as far as possible, enjoy access to monuments and sites of national cultural importance.”

According to the WHO, disabilities can be analysed at three levels: physical, sensory and intellectual/mental. In our study we will focus on the first two, in physical it will be more related to the accessibility of cultural assets and services regarding the activity limitations imposed on disabled subjects, almost touching the geographical problem, despite having proximity some people may not be able to have access anyway, and in the sensory the ability to enjoy culture through the creation of new “translations” of the cultural goods and activities, adapted to the impairment of the individuals.

In the World Report on Disability (WHO, 2013), another relevant point is brought into light, this people also tend to have more socioeconomic difficulties, due to difficulties in getting a job, discrimination, lack of acceptance in society and less access to education, therefore this problem also overlaps in a way with the first one we explored. Approximately 15% of the world adult population suffers from significant functioning problems (*World Health Survey*), and these people have severe difficulties in access and using ICTs and the new digital media.

To analyze disabilities, WHO created the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0), covering 6 areas of functioning: “Cognition – Understanding and Communicating”, “Mobility – Moving & Getting around”, “Self-care – hygiene, dressing, eating and staying alone”, “Getting Along – Interacting with other people”, “Life activities – Domestic responsibilities, Leisure, Work and School” and “Participation – joining in community activities”. This allows us to understand how disability should be approached, Dobransky and Hargittai (2016), in their study of limitations in digital access, focused 6 questions, problems in hearing, in seeing, difficulty making decisions or concentrating, difficulty in mobility, dressing or bathing and doing errands alone, as we can see this matches all the criteria proposed by WHO. Analyzing the Australian cultural industries and complaints on accessibility by people with disabilities, the main represented groups were people with difficulties in mobility, vision, hearing, respiratory problems and people who had their speech or moves diffculted by the disability (Darcy and Taylor, 2009), which already gives us an indication of what major disabilities we should focus for technology to help us improve access.

Individuals with disabilities have been excluded from the thought and planning of art institutions, not only by not providing the necessary physical infrastructures for them to enjoy culture but also limiting their participation. The democratization of culture to this group of people encompasses much more than just the infrastructure adaptation, citing Shandall (2018) “Meaningful integration requires fundamental changes that impact every aspect of an arts organization – from seating configurations in a theatre, to marketing strategies, to budgeting for access and accommodations, to staff training, to making artistic and curatorial choices.”, and technology can be the answer to the challenges regarding the artistic and curational choices, either by providing the work of art through a new medium or by just creating something completely new, with a level of access that was previously impossible to achieve.

Geographical

The geographical location of cultural assets and services are a barrier to access and participation, with cultural production and diffusion tending to concentrate in specific areas (Pratt, 2007), a concept the author labelled as “spatiality of culture”. These geographic barriers can translate into several factors that affect the participation of individuals: time and cost, spent in travelling, access and transportation

infrastructures, and the distance to the location (Evans, 2016). This factor determinates the offer available to individuals in different countries, cities, regions (EU, 2015), cultural and arts institutions tend to concentrate in big cities, creating significant disparities for inhabitants in the same countries, and even in this case, it can create big differences for people living in the city or the suburbs, due to transportation needs for example.

Croatia is a clear example of the centralisation of cultural goods and services in the capital Zagreb, Primorac (2015) defends the need for cultural organisations work together to spread their programs across the country. This concentration of culture tends to exclude more impoverished people, and people from rural and less developed areas, the subject has been approached with a new vision of bringing culture to people (EU, 2015), instead of hoping that people can get to where the cultural services are installed. Despite this, the truth is that research has a gap in the relationship between geographic location and cultural participation (Evans, 2016), with most of the focus on cultural demand, and in current participation of people, not taking into account possible barriers that may exist. The European initiative of “Capitals of Culture” also showed that location is, in fact, a determinant in accessing culture, since these cities have failed in creating new audiences (Pasikowska-Schnass, 2017), with their initiatives attracting mainly the people from the area.

Brook (2016) concluded that increased accessibility in geographic terms worked as one of the main predictors on people’s frequency of participation in London’s galleries and museums, getting a more in-depth insight, that the effect of lack of access to cultural institutions affects more disproportionately the groups with less prone to attend them, such as ethnic minorities, people with fewer qualifications or from lower social status. But even with access, we may still not see an increase in participation, due to the lack a sense of belonging to cultural spaces (Evans, 2016), it is also vital to create spaces where people feel safe and in community, since poorer people or from lower social classes tend to feel as outsiders in places such as galleries and museums.

2.2. TECHNOLOGY IN THE SERVICE OF CULTURE

2.2.1. Historical Overview

When we think of technology nowadays, the most common association is with the industry and ICTs, more generally the Web, Internet, computers, smartphones, the technologies that are present in our daily life, but this is a limited view of such a broad concept. Technology corresponds to the scientific knowledge, specific to an area, with practical application that allows accomplishing something concrete (Cambridge Dictionary; Merriam-Webster; Britannica, 2019), which means that all the knowledge that resulted in some new advance in a given area or industry is considered technology. And even our view of what constitutes ICTs can be limited in scope, restricted to the current times, but if we look to the past art can be considered an older form of Information Technology (Schroeder & Borgerson, 2002), such as paintings and sculptures, which in fact communicated and shaped through imagery the values and ideals of the Epoque. Art and culture evolved not only in the thematic and style but also innovated in the techniques and materials used (Schroeder & Borgerson, 2002), which represent a form of technological advancement.

The development of technology and information systems is leading the way to the possibility of a new era in cultural participation and access. In the beginning, participation was defined as access and being connected, but with Web 2.0, this concept evolved to the constantly referred principles of

collaboration and interaction (Schäfer, 2011). The change in how people communicate and create content is leading to the possibility of virtually anyone becoming a creator, despite the alleged consequences that this can imply in terms of quality. Furthermore, Web as we know it, and, especially, Social Media is now vital to create awareness of new movements and creators, being much easier to get to a target audience at lower costs. With the media and digital culture becoming intrinsic in everyday life of individuals, it is crucial to have a full comprehension of the new technologies and media, and how they function, to be able to understand how it can and, likely, will shape the way culture is consumed (Schäfer, 2011).

We are in the era of digital culture, with the surge of the computers and unprecedented capabilities of processing, storing, managing and sharing information, the way we communicate has been profoundly altered, which implies significant transformations on the cultural sector (Lavender, 2010). The widespread and easy access to information and in communication have changed the paradigm of people in the culture sector, having three roles: curators/creators, a more active position than ever before, new publics, with so many new channels to get to people and engage them in cultural activity on-site or online, and as critics and commentators, going in trend with the constant and on the moment feedback.

Regarding the product and its placement, we had an initial phase of digitization focused on physical products, where they remained the same, but were present online and therefore were more accessible in terms of geographical and economical constraints (European Union, 2017), and this evolved to also have online distribution of live performances through recording and streaming, this mainly attracted an audience that was already interested in the product. The capability to create new forms through the use of ICTs, allowed cultural institutions to reach new and hard to reach consumers, enabling knowledge spreading and the use of new visualisations technologies such as the use of immersive reality tools (Bekele, Pierdicca, Frontoni, Malinverni, & Gain, 2018).

With the obvious relevance that technology has in the present, new concepts surged, one of them crucial in the study we are doing, social computing was first referred in the 40s regarding the concepts of collaborative work and communication facilitated by a computer. It has evolved ever since, and in 2007 it was defined as “Computation facilitation of social studies and human social dynamics as well as the design and use of ICT technologies that consider social context” (Wang, Carley, Zeng, & Mao, 2007). The applications of this theory englobe how we can communicate and interact with culture in the creation of online communities and interactive entertainment (Wang, Carley, Zeng, & Mao, 2007) and has been given special attention in the sector of cultural heritage and its accessibility (Kosmas et al., 2019).

2.2.2. Current Technologies

In the UK, three organisations joined forces to study, dynamise and fund innovation in the arts and cultural sector: Nesta, the Arts Council England and the Arts and Humanities Research Council. The first study, conducted in 2013, analysed the use of technology by the institutions in the sector at the time and presented a broader explanation of the possibilities existent as well as the limitations that cultural organisations could face in adopting digital technologies. After that four more reports were published in 2014, 2015 and 2017, following the evolution of the use of digital technologies across an increasing number of participants in the study.

This initiative was motivated by the challenges that the sector has been facing that can be divided into four main areas: changing patterns of demand from offline to online experiences, changes in funding availability due to the economic situation, the fast technological development that has influenced all the economic sectors, and the evolution of the concept of value creation due to the new concepts of cultural and artistic content that the current ICTs allow, with free and widespread distribution channels at the reach of virtually anyone (Trott, 2009). To fight this is necessary that cultural institutions innovate in how they reach their audience, in the form of their creations and in the use of technology to create not only cultural value but also explore new revenue streams, also implying a more precise definition of a business model (Bakhshi & Throsby, 2012).

The integration of new technologies is becoming crucial for cultural institutions to prevail and prosper, innovating in their offer to the public, but also due to the pressure to reinvent themselves and their business models, based on the analysis of new technologies applied in cultural organizations from Bakhshi and Throsby, Trott listed the uses given to it by art galleries, theatres and museums with particular focus on the last one. The use of technology is divided into two categories, to be applied to the museum facilities, this is when the consumer goes to the museum, and online. On the physical museum technology can be used to create new types of experiences and interactions, either through the way information is passed to the visitor, with multimedia tours, interactive kiosks, expanding the reality, using augmented, mixed or virtual reality, this allows the consumer to have completely new layers of information interactively and on-demand. On the online side, one of the biggest areas of innovation is the creation of digital assets, either by merely mirroring the physical collection online, creating specific content for the new media channels, going to the endpoint of creating a virtual museum, providing new and more diversified experiences at the reach of any consumer. Furthermore, as in any other sector, the web presents a significant opportunity in terms of marketing and sales. Most of these innovations can in some way be replicated in other cultural assets or venues.

In the UK study, in 2013, most of the organizations recognised the importance of digital for marketing, preservation and archive purposes and operational efficiency, but there were variations based on type of art and size of the organisation. Focusing the most technologically advanced institutions, the objectives attained are considerable, presenting a more prominent digital presence in terms of creation and distribution, reaching larger audiences and are far more likely to report associated positive impacts from embracing the digital, proving that there are indeed benefits to explore in the sector.

The questionnaire used in the study focuses five big areas: “Creation, Preserving and Archiving, Distribution and Exhibition, Marketing and Audience Development and Business and Operational Models” (Digital Culture: How arts and cultural organisations in England use technology, 2013), which shows the broad impact that technology can have, since it can influence all the areas of the cultural sector. In 2017, almost 70% of organisations reported positive impacts from digital technologies with more importance attributed to the development of business models; the importance given to the other four areas decreased. Most of the digital activities performed in 2013, saw a decrease in 2017, except for online donations, online ticket selling, paid advertising and the live stream of performances.

Storing cultural information and knowledge in an organized and structured way is one of the bases to the use of ICTs, allowing to provide cultural heritage information in an easy and accessible way in order to provide the information for the creation of visualization applications, from digitized cultural assets, to 3D models of monuments or heritage locations (Kosmas et al., 2019). This type of applications works

to improve engagement of the public with the physical, cultural content, providing information in an interactive, creating both user-display and social interactions, and immersive way, with AR, VR or MR, engaging the user using methodologies such as gamification and storytelling (Kosmas et al., 2019).

Heritage sites should focus on evolving their relationship with the consumer, building a more experiential and relational approach, leveraged on new technologies to build a mix between the on the site and digital experience, which leads to an increase in engagement (Colbert and Courchesne, 2012). The use of immersive technologies for the visualization of cultural information and content is critical to achieving this objective (Bekele, Pierdicca, Frontoni, Malinverni, & Gain, 2018), this term englobes the spectrum from the real environment to Virtual Reality (VR), in between we have Augment Reality (AR), Augmented Virtuality (AV) and Mixed Reality (MR), allowing the experience of a mix of interactive layers of real and digital reality (Bekele, Pierdicca, Frontoni, Malinverni, & Gain, 2018). While AR and MR enable the interaction with the surrounding environment, in a real-time experience, by adding and mixing virtual elements or altering digitally the present physical reality, VR creates a wholly digital and immersive representation of reality.

AR in Cultural Heritage is mainly used for improving the public experience, for heritage reconstruction and data management and exploration (Bekele, Pierdicca, Frontoni, Malinverni, & Gain, 2018).

VR together with 3D data and imagery is being used to create virtual museums, virtual reconstruction and exploration, as well as, for educational purposes (Bekele, Pierdicca, Frontoni, Malinverni, & Gain, 2018), despite VR implying the creation of a virtual world, apart from the physical, it does not mean it is a fictitious world, it can be just a different stage from the current reality, such as a representation of a cultural heritage location in its original shape.

2.2.3. Technology for Accessibility

“State-of-the-art solutions in voice interaction, scanning, visual layout adaptation, touch and haptics interaction, gestures, eye tracking, head pose interaction, sign language, persuasive and affective interaction, serious games and augmented reality” (Kosmas et al., 2019), are some of the possibilities that technology offers for the development of inclusive experiences in the theory of social computing applications.

Technology can have a big impact on access, creating new opportunities to reach audiences that previously were not possible, and breaking the geographical, socio-economic and disabilities barriers (European Union, 2017). Reaching audiences can be achieved through either by getting new publics, audience diversifying, increasing the penetration in the current public, audience broadening, or by increasing the engagement of the public, audience deepening (Bakhshi & Throsby, 2012). One of the baselines of innovation in this area is for marketing purposes, through digital marketing to have information reaching more people, and facilitate sales through online distribution channels. But there is more to exploit, such as live transmissions of performing arts shows, that allow anyone in the world to enjoy the experience despite the geographical constraints, and even the social-economic ones, since online broadcasting may imply lower costs of access (Bakhshi & Throsby, 2012), furthermore in places such as museums, libraries, art galleries, it can also provide a boost in how information is provided to visitors, as well as increase the availability of information either on the spot or online.

When talking about accessibility, we have two areas to explore, the physical accessibility, which considers infrastructure access, and access to the physical exhibition in terms of information and

knowledge. Nevertheless, we also need to consider the digital accessibility, since technology can bring innovation that increases the audience reached, but digital tools and assets can also bring new barriers to access for people with disabilities (Lisney, Bowen, Hearn, & Zedda, 2013; Kosmas et al., 2019). To reduce this, it is necessary that the digital initiatives consider the rules of Universal Design (Lisney, Bowen, Hearn, & Zedda, 2013) and principles of Human-centered Design for information visualisation (Kosmas et al., 2019), in the last taking always into account the social side of the interactions. When integrating technology into knowledge consumption and acquisition, the design of such experiences should always have in mind that the core is the content, technology should always work as a mere mediator (Kosmas et al., 2019).

Another difficulty is to include deaf and hard-of-hearing users in a more in-depth cultural experience, allowing the immersion in storytelling scenarios, which mostly rely on audio channels (Kosmas et al., 2019). The development of assistive technologies for this type of users is crucial; the audio tour concept has four strands: audio-only, text guides, audio-visual and audio and text. The Roald Dahl Museum and Story Centre develop an app of audio-visual tours, Signly, that has sign language videos delivered to the smartphones of users, allowing deaf people to access the exhibits independently ('Culture Is Digital—GOV.UK', 2019). The use of smartphone guides, which can be done through a guided tour or free choice tour, as the case of Signly, promote access to meaningful cultural information and social inclusion for these individuals (Kosmas et al., 2019). For people with hearing impairments, from mild to moderate hearing loss or even people with hearing aids, mechanisms based on Assistive Listening Systems (ALS) can improve audibility in theatres, exhibitions, guided tours, and even outside events and festivals (The Kennedy Center, 2016), with different types of systems, receivers and coupling devices, that should be chosen according to the venue or cultural space. There are several use cases of technology to improve the capability of this people to enjoy cultural experiences, in the National Theatre in the UK, hi-tech glasses were developed to allow deaf people to have subtitles throughout the performance.

A lot of the innovation brought by technology has had an emphasis on visual experiences, digital art is most of the times visual, as well as most of the physical cultural assets, from heritage sites, museums or galleries, and with the disadvantage that it is now impossible to touch, excluding visually impaired people from enjoying the cultural goods that are now being produced (Lisney, Bowen, Hearn, & Zedda, 2013).

In studies performed in two leading art institutions in the UK, The Tate Museum and The National Theatre, regarding the broadcasting of a theatre show and an online art exhibit (Bakhshi & Throsby, 2012), it was possible to observe that at least two of the three levels of audience broadening were achieved, with people that watch a theatre show in the cinema revealing higher ratings of their experience than the ones that watched it live. This demystifies the idea that the real experience will always outperform any other medium, meaning that this kind of innovation creates economic value, with more paying customers for the theatre, and cultural value, since the audience revealed high levels of satisfaction with the experience. It is essential to notice that these initiatives allowed the public to overcome both geographical and economical limitations, as well as the problem of scarcity of access to live events.

In terms of access, the main focus of technology is on the area of distribution and exhibition, with ICTs allowing cheaper and broader distribution, with a multitude of channels that have been developed (Digital Culture: How arts and cultural organisations in England use technology, 2013), but in 2013 only

one third of the institutions considered this essential, and the cultural institutions that have physical exhibitions and cultural products are the ones that value most this type of innovation.

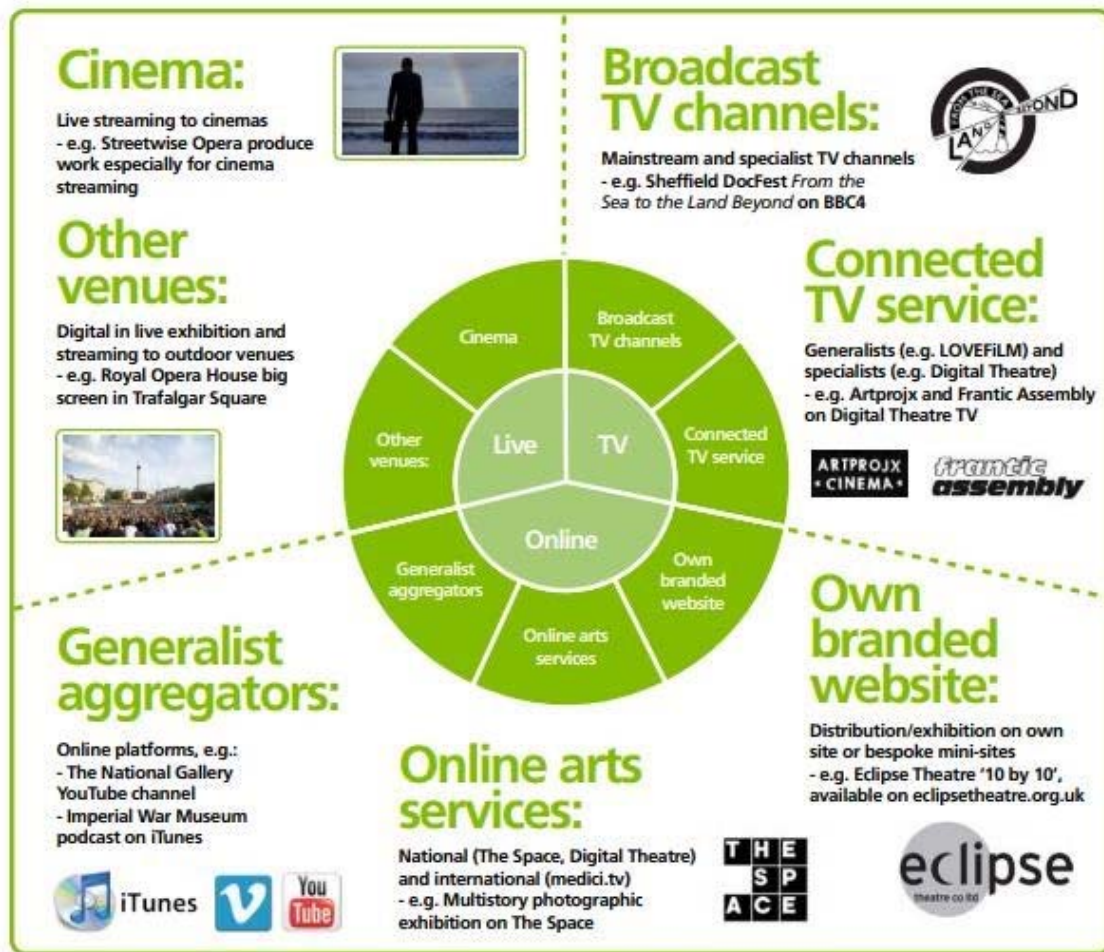


Figure 3: Online Distribution Channels (Digital Culture: How arts and cultural organisations in England use technology, 2013)

From 2013 to 2017, there was a significant increase in the number of UK institutions referring the impact of digital in the creation of audiences, for all the three levels of audience development, despite the general decrease in the belief of the importance of digital for the area of distribution and exhibition.

Technologies such as Augmented Reality, Virtual Reality unbundle a world of possibilities in terms of the way we access art, make the human being capable of interacting with it, immerse in it, taking the cultural journey to an entirely new level. The Foundation of Hellenic World, that works towards the maintenance and dissemination of the Hellenic culture, is an example of how Virtual Reality can be implemented to allow an entirely new level of access to historical facts, creating content that allows visitors to explore this era in an immersive way, with virtual tours through ancient cities and temples, or the primordium of the Olympic Games (Gaitatzes *et al.*, 2001). This is just an example of how this technology can be applied and how far is its reach. It allows users to travel to the past, as well as it can allow someone from Asia to access cultural heritage in Europe without ever travelling there.

To become fully accessible, cultural heritage and institutions need to consider those with disabilities and include in their exhibition creation process the limitations that these people may have, and work

around them through the integration of multisensory approaches, as well as several learning approaches, working to also include people with different levels of education, impacting the access of people from different social-economic backgrounds (Kosmas et al., 2019). This can be attained exploring new media and technologies to allow sensory experiences in broad scope, audio, touch, visual and interactive, that will allow the immersion in the experience despite any handicap that may exist, or despite having lower levels of cultural capital, through an easily relatable way of approaching cultural content.

2.2.4. Challenges

For the future, there is the need of constructing a digital infrastructure for culture ('Culture Is Digital—GOV.UK', 2019), with the objective of digitizing collections, going from live to digital, with emphasis on performative arts, bringing the shows online, and invest in cultural R&D and experimental spaces, to create and test new technologies and allow the development of new concepts and cultural experiences.

The digital shift also brings challenges in the use of the technology, in specific when targeting new audiences through tactics of digital marketing, we can have the opposite effect of the desired, since the target of individuals is based on the internet history of each one, this way it can difficult the contact with new consumers (European Union, 2017), since the technology limits the scope to people that are already interested or related with the content that institutions are trying to sell.

To attain the objectives in the use of digital technologies, cultural institutions need to have digital skills that allow them to perform and achieve innovation, in figure 3, presented below we can observe the mapping of the evolution of such skills from 2013 to 2017.

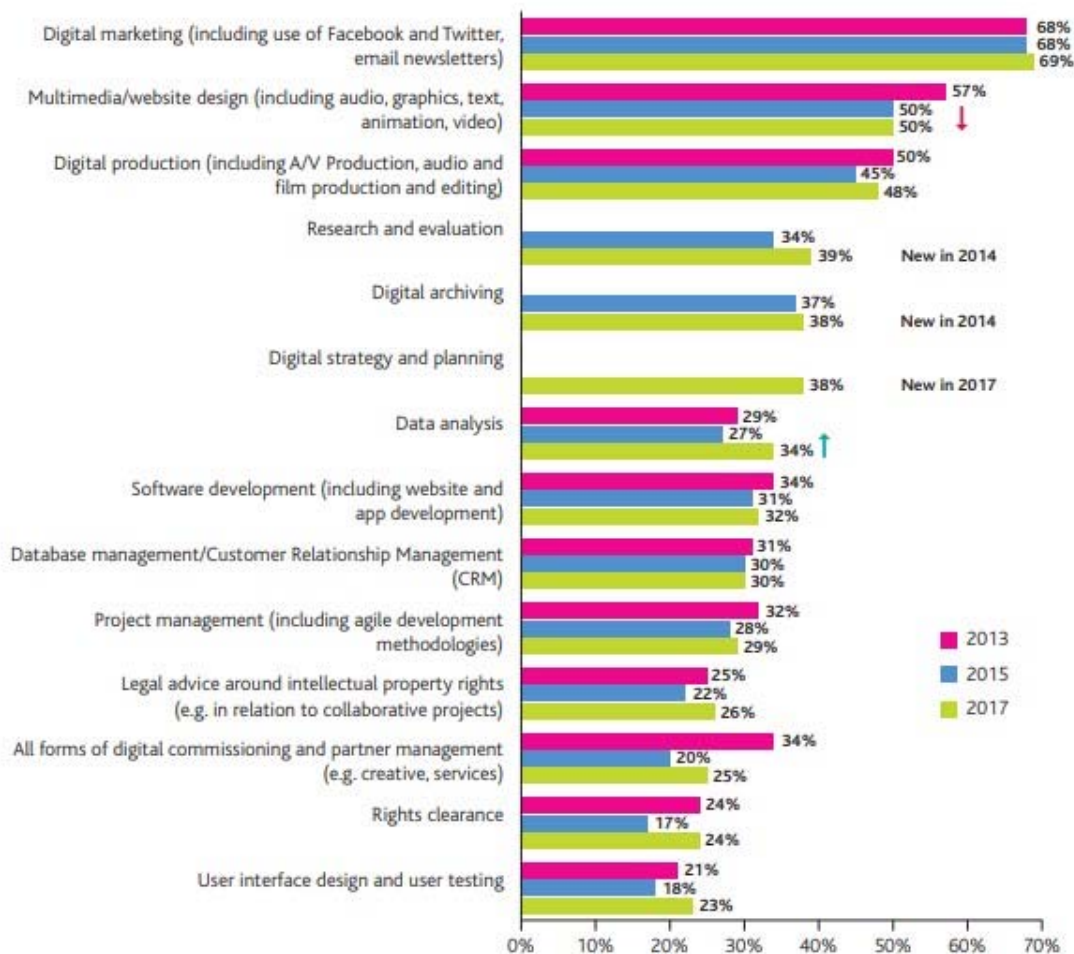


Figure 4: Evolution of digital skills in cultural organisations in the UK (Arts Council England and Nesta Digital Culture Survey 2017)

Despite the broad need of requirements in terms of digital skills, they can serve as the basis for a big variety of initiatives, however, the current development of technology may imply the need for more specialized skills in areas such as Virtual Reality (VR) or Augmented Reality (AR), that are some of the most preferred for the current and future development of new experiences in the cultural sector.

3. METHODOLOGY

3.1. DESIGN SCIENCE RESEARCH

On our work, we will apply the Design Science Research (DSR) methodology to research and identify the problematics that limit cultural accessibility and match the information and communication technologies that can or have the potential to mitigate such problems, in its several dimensions, through a pairing framework. This means that we will use the knowledge acquired through research in the literature review to build an artifact, that despite not creating innovation, it sums up and presents the knowledge obtained in a new and easily comprehensible way, that did not exist before.

With this in consideration, the choice for the methodology was Design Science Research (DSR), since it is defined as a problem-solving paradigm (Hevner et al., 2004), that translates into the creation of artifacts that contribute with knowledge to solve a research problem (Peppers, Tuunanen,

Rothenberger, & Chatterjee, 2007). To be valuable it has to contribute with practical or functional knowledge that needs to be codified and communicated (Vaishnavi & Kuechler, 2004) to the community that can leverage it, this includes both researchers that can work upon it, and practitioners who will either do the decision making of implementing the solutions found or actually implement them (Hevner et al., 2004). Furthermore, the research should address the problems identified, and the opportunities that arise from “the interaction of people, organizations, and information technology” (Hevner et al., 2004).

This method is based on the creation of an artifact, that can take several output forms, in our case it will be a framework, “real or conceptual guide to serve as support or guide” (Hevner et al., 2004) to the relevant community, using existing knowledge in a new way, with high levels of generalization. This process of artifact construction allows the accumulation of knowledge in how to solve the research problem, and the evaluation of the output in an iterative process, allows the improvement of the solution presented based on the knowledge obtained in the research phase (Hevner et al., 2004).

We analysed two DRS research process models, the model by Vaishnavi and the one by Hevner, but the last one was focused on the applicability in organizations, and in our work, we intend to create an output that has a broader scope, including organizations, but also governmental decision-makers, and a scope of application that can comprehend several types of organizations, initiatives, spaces and products, therefore we chose the model by Vaishnavi which is more theoretical.

The chosen model is presented in detail below based on Vaishnavi (2004) work “Design Science Research in Information Systems”:

1. Awareness: includes the choice and research of a problem, with the objective of describing, explaining and addressing the problem using theory and exploring the existing knowledge regarding the theme, to obtain a new valid and relevant research question.
2. Suggestion: in this phase, the researcher makes an initial attempt to design a solution to the identified research problem, comprehending a more creative moment of the methodology.

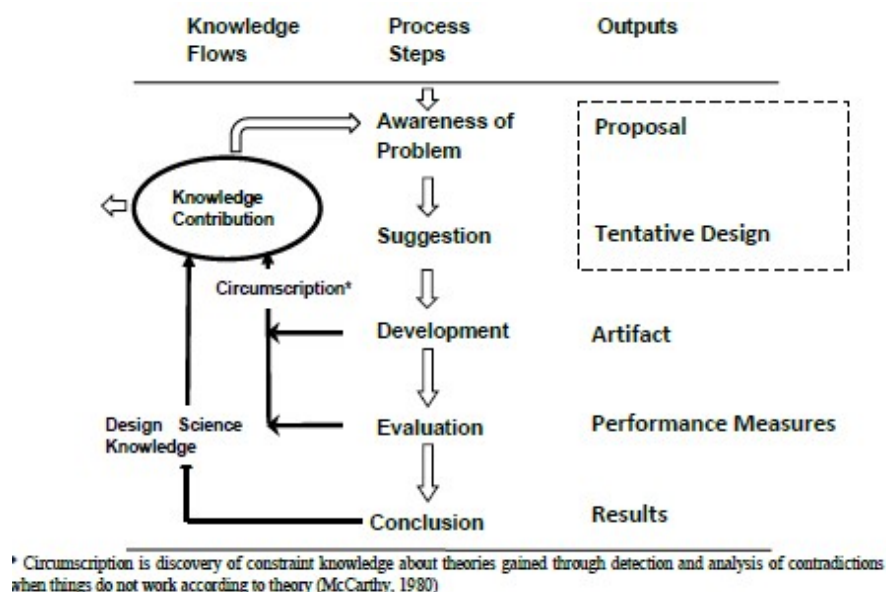


Figure 5: DSR Process Model (Vaishnavi & Kuechler, 2004)

3. Development: includes the implementation and development of the prototype design, to obtain an artifact, the way to do it vary depending on the desired output for the research work.
4. Evaluation: at this point, the attempted solution is put to test, through techniques that allow to collect feedback about the behavior and the quality of the solution, given the initial problem. This new information will be used to improve the design, which can result in an improved prototype or even in a new design.
5. Conclusion: this is the final stage of the process, what does not mean that we have achieved the perfect solution or design, but that results are “good enough” for the problem proposed. As the result of the work of design research science, we consider both the artefact and the knowledge acquired during the research process and the facts learned that can have more applications in the future. This means that the results of this process are not only about the solution, it is broader in the sense that all the knowledge that can be added up to the field resulting from DSR is also equally valuable.

3.2. RESEARCH STRATEGY

In this section we will describe how each step of the process of the DSR process model has been used in this research work.

Awareness of Problem

The literature review created awareness for the problems culture accessibility and the lagging of the cultural sector in using technology and information systems that can serve the problems found, in this phase we collect all the knowledge in the field that is already validated and create our expertise on it, based on researcher reading and getting to know and comprehend the other works on the same area of knowledge, we pinpoint the concepts and theories that are relevant to our research.

Suggestion and Development:

- First, analyse the culture sector and all the relationships existent to identify problems of access and management.
- Second, analyse and compare technologies to assess which cultural access problem they can solve.
- Third, create a conceptual framework to map and communicate to the audience the relation between each cultural access problem with the information systems platform or technology that can mitigate or solve the problem.

Data collection: This study used a comprehensive literature review to define categories and subcategories of problems of culture accessibility and the impact of information systems in each of them, which resulted in the creation of the conceptual framework.

Conclusion: Summarize and present the final results of this study, while indicating the limitations of the current work and possible future work that could improve or complement this research.

It should be noted, that only the first three stages from the proposed DSR methodology were concluded successfully in the development of this research project, namely the Awareness, Suggestion and Development phases, meaning that this work presents the state-of-the-art in terms of culture and technology, and based on it we present the proposed framework. To perform completely the Vaishnavi model that was presented in the previous section, it would be necessary to have completed the Evaluation and Conclusion stages.

4. FRAMEWORK

4.1. ASSUMPTIONS

From the literature review about culture, we obtained a complex system of relationships between the culture and its products and agents, represented in Figure 6 below.

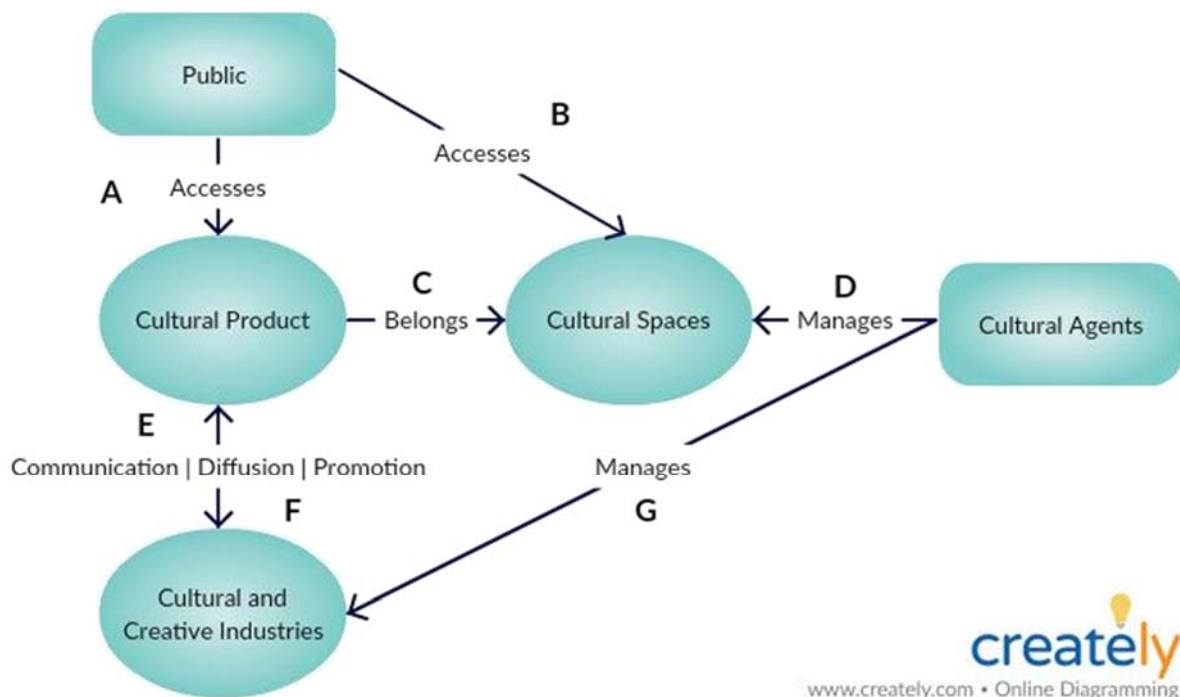


Figure 6: Relationships between cultural products and agents

In culture, we have two types of agents, the public and the cultural agents, that will interact with culture, both with its spaces and products, but with different types of relationships. The Public accesses cultural products, that may or not be in a formal cultural space, and by consequence accesses this same space. The cultural agents have a management task, the cultural decision-makers and authorities manage the cultural spaces and products, all the way through the broader picture regarding the cultural and creative industries which are shaped by the decisions of these people and cultural policies. Shaping the cultural and creative industries will impact the cultural product, since this is how we currently shape our cultural norms, and the big cultural machine that emerged with the industrialization brought the capability of promoting, distributing and communicate culture and its assets to a whole new level.

Despite the use of the term creative and cultural industries it should be noticed that our study will not focus the entirety of its definition. In the chapter 2.1.2. Cultural Assets Classification, we explored several models of cultural classification systems that together with our definition of culture that supposes the creation of cultural products and services, led us to conclude that some areas should not be seen as part of this study, in specific:

- **Design and creative services:** these are cultural services that serve mostly commercial and creation purposes that may not lead to a cultural output ('The 2009 UNESCO Framework for Cultural Statistics (FCS) – UNESCO Digital Library', 2009)
- **Natural Heritage:** despite being framed as part of a cultural domain by UNESCO, it is not created by humans in an act that involves creativity, furthermore it is controlled by different agents and policy makers
- **Intangible Heritage:** lacks a physical product or formal space, decision and policy makers difficultly can act on it

In the literature review about culture, we also explored the problems of access that were faced in the relationships stated above, which originated a list of problems that could be mitigated by technology, this list is detailed below in Table 1.

Edges	Problems impacted by technology
A, B	Socio-Economic; Disabilities; Geographic
C	Product Mobility; Complementary information
D	Asset Management; Operational Management
E	Advertisement; Large scale cultural reproduction; Cultural Events
F	Achieve Economies of Scale; Audience Maximization
G	Strategic Management

Table 1: List of identified problems that can be mitigated through technology

In Table 1, we identified all the problems that surge in the relationships of access and management that were identified in Figure 6, each relationship is identified by the letter assigned to it in the previous schema. The problems found are specific to the function of each agent and will always be common to the space and product.

- **A, B:** The public suffers 3 types of barriers in accessing cultural products and spaces, the socioeconomic condition limits their income (which may impact also their time availability) and cultural capital availability, disabilities create barriers in access to the spaces and to products, and each disability requires a proper specific solution, and geographical distance can limit the diffusion reach of cultural products and spaces, that can be exacerbated through the existence of any of the other barriers, such as income and disabilities.
- **C:** The cultural space displays the cultural product, and problems can surge in the integration of the product in the space, regarding the offer of complementary information that can improve the cultural experience. The mobility of the cultural product between cultural spaces is also a problem that can be mitigated through technology, and that will consequently mitigate other problems in the A and B.
- **D:** The cultural agent has two main big problems in the management of cultural spaces, the asset management and the operational management, that includes ticket offices, the management of the spaces and its people.
- **E:** The cultural agents, through the management of the cultural and creative industries, will deal with the tasks of diffusion and promotion of the cultural assets, this leads to duties in advertisement, that digital capabilities can influence a lot, in how to reproduce cultural products in large scale, which is only possible due to the information revolution, and in organizing or being part of big cultural events.
- **F:** On the other side, the cultural product takes advantage of the cultural and creative industries and its capabilities, to achieve economies of scale and to maximize audiences. For this to be possible and in an effective way, the problems in E need to be addressed, only through improving the promotion techniques, and being able to achieve high diffusion, either geographically or online and being able to get the message to the higher number of people, it is possible to take advantage of the pros of the creative industries.
- **G:** The cultural agents, either in the form of cultural managers or cultural spaces managers decision makers, or policy makers, can mutate and define the concepts that determine culture in the present. The shaping of the cultural and creative industries is crucial to determine what is included as cultural product, space, and consequently how its promotion and distribution will occur.

4.2. FRAMEWORK

We will propose a framework that puts technology on the service of cultural access, based on the integration of the knowledge gathered in the literature review and in the previous section, 4.1. Assumptions. The proposal results from the analysis of the cultural problems and barriers that can be surpassed or mitigated using technologies, which are illustrated in Figure 7 below.



Figure 7: Representation of the concepts and barriers identified in the cultural sector

Previously, we presented schematically the relationships in culture and detailed the problems in them, now we have a visual representation of the barriers existent in the different relationships identified. In the center we have the cultural assets represented in two layers, the product contained in the space, which generates a dynamic relationship that may have barriers. In the third circle, we have the problems identified, in a more generalist way, we can reduce Table 1 of identified problems to three core themes: accessibility, management and promotion. In the last layer, we have the agents that suffer the consequences of the barriers existent in the cultural sector, the public and the cultural agents. It should be noticed that despite being subject to the problem of access, the public has no other function here, which means that in the end, the cultural agents are the ones responsible to sort the three problematic areas.

The technologies that can be used to decrease the barriers in the relationships we identified previously, are stated in Table 2.

Barrier	Problem	Technologies with mitigation potential
A: Access to the product	Socioeconomic	AR, VR, MR, 3D imagery, Digital exhibition/repository, Streaming
	Disability	Audio tour, Assistive Listening Systems, Mobile Apps, AR, VR, MR
	Geographic	VR, 3D imagery, Digital exhibition/repository, Streaming
B: Access to the space	Socioeconomic	AR, VR, MR, 3D imagery, Gamification

	Disability	Audio tour, Assistive Listening Systems, Mobile Apps
	Geographic	VR, 3D imagery, Streaming
C: Product and space	Product Mobility	VR, Digital exhibition/repository, Streaming
	Complementary Information	AR, VR, MR, Mobile apps
D: Space Management	Asset Management	Big Data & Analytics, Blockchain
	Operational Management	Online distribution channels, Big Data & Analytics
E: Promotion Management	Advertisement	Social Media, Website
	Large Scale Reproduction	Digital exhibition/repository, Streaming
	Events	Digital exhibition/repository, Streaming, 5G
F: Public Creation	Economies of Scale	Digital exhibition/repository, Streaming
	Audience Maximization	Digital exhibition/repository, Streaming
G: Strategic Management		Big Data & Analytics

Table 2: Conceptual Framework

VR, AR, MR and 3D Imagery

These technologies are can mitigate problems of access to the space and the product, in the socioeconomic problem it can facilitate the relationship of the individual with the assets, through a different interaction experience, absorbing information in a seamless way. VR can allow products and spaces to be experienced by people anywhere in the world, visiting a virtual museum or virtual heritage site, and all of these technologies can provide a more immersive and engaging experience for people with several types of disabilities that may not allow them to experience it in reality or that may limit their hearing for example.

They are also relevant for the dynamic between the cultural product and the space, providing an engaging form of present complementary information.

Digital Exhibition/Repository

A digital archive or reproduction of the cultural assets impacts the problems of access to the product regarding the socioeconomic and geographic concerns since all the content is available online, as well as the dynamic between product and space in terms of product mobility, since the product can be exposed in a multitude of places.

In the Promotion area, digital repositories and online platforms are essential in large scale reproduction promoting cultural diffusion due to easy access.

These digital reproductions of the physical assets or the production of digital content can allow to reach most of the targeted audience as well as bringing new people due to the new forms of culture presented.

Streaming

Streaming is predominantly relevant for live exhibitions and performing arts, allowing the mitigation of socioeconomic and geographical barriers, since this shows tend to be expensive and the performing arts tend to create a social and cultural environment that excludes lower classes. It erases the limitation of the product to the cultural space, or venue in this case, since it allows the transmission of a show in any screen.

Live shows and performative arts tend to be scarce and limited goods, therefore streaming is important in terms of promotion management, since it is only through this type of technology that it will be possible to achieve a big diffusion through large scale reproduction. This way, the cultural agents can reach more and new publics, promoting public creation.

Big Data & Analytics

Space management requires a variety of data to understand how people use and interact with the space and products, to improve the management of people flow in spaces and the interactions with the exhibits and products, impacting both the sectors of operational and asset management. Data driven decision making can bring more efficiency to the management process, while improving the consumer experience.

Audio Tour

The audio tour mitigates some disabilities, such as visual impairments, difficulties in speech comprehension or in social interaction, it gives autonomy to the individual to explore the cultural assets, specially if it is a non-guided tour, allowing the individual to choose its own route and timings. It can be complemented or enhanced in combination with other technologies and devices.

Assistive Listening Devices

Crucial for individuals with hearing impairments, it is a crucial tool for knowledge and information transmission, it can be coupled with an audio tour or transmit information based on technologies such as QR codes, as in the case of a museum or gallery, or be used during a live exhibition or museum tour, to overcome the difficulties in hearing and enjoying the experience as a whole.

Mobile Apps

Proprietary mobile apps are key to support other technologies and tools. Presenting the audio and or text tours through a mobile app facilitates the process for the consumer, since the only necessary device is their own smartphone, and the same rational is presented for the integration of complementary information in cultural spaces. It is a channel of promotion and can also exhibit cultural products, and it can be a valuable source of relevant data to feed the data repository used in Big Data & Analytics.

Social Media

It is important to create a relationship with the audience, and be present where they are, as such social media is a key tool on promotion, not only in online advertisement but also in creating a presence online that can engage the public. It is important to notice that in terms of online advertisement there can be a limitation in its use, mainly for getting new audiences, since online ads target people that are or tend to be more interested in our offer.

Website

The website is a tool of online presence and promotion, that can create engagement with the consumers, and provide useful information in terms of access. It can also support other technological initiatives, such as the digital exhibition/repository, streaming initiatives or 3D imagery.

Blockchain

In the future, blockchain can be key in the area of asset management, since it will allow to always track and validate the originality and value of cultural products, in a distributed, non-comprising and reliable way.

Online Distribution Channels

Selling tickets online can be done in our own website/app or through third parties, such as online ticketing platforms for events, this will not only agile the operational efficiency, as it can also work as promotion channel and lead to audience maximization and creation.

The presented framework is based on the knowledge from the literature review, which means that no expert analysis was made, the lack of the evaluation stage and of the contribution of cultural decision and policy makers does not allow for further discussion regarding the obtained results. According to the literature review, all of these technologies can at least mitigate in some way the researched problems, providing general guidelines when considering technological planning and implementation for the cultural sector.

5. CONCLUSIONS

The objective of this work was attained, with the creation of a framework to facilitate the choices of cultural decision and policy makers regarding the use of technology in the cultural sector. The performed research showed that there was indeed a set of threats and barriers in culture and in its accessibility, and that currently there are technological capabilities that allow to overcome, or at least mitigate, these problems. There is a group of barriers that demotivate people to participate in culture due to the limitations in their capability of accessing it, and the cultural agents also face problems related to getting to the public, but also in all the management responsibilities regarding the operational, commercial and strategic sectors. Information and communication systems can transform how people access and interact with culture, but also how the responsible agents can manage their work fronts, improving the promotion of cultural assets, their availability and accessibility to the public, both in terms of information about culture, or related to the promotion and interaction with the cultural space or the cultural product itself.

5.1. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE WORKS

We did not have the opportunity to perform the evaluation and validation phase of the methodology with relevant experts in the area on the time frame of this research work. This stage would include another moment of data collection, through interviews with cultural decision makers and/or policy makers, in which the framework would be evaluated, both the identified problems and possible solutions. This process would allow us a deeper insight on the research question, as well as the incorporation of the feedback in the framework through a redesign process, as it is expected in the Design Science Methodology we followed.

It should also be noted, that this is a conceptual guide of recommendations, based on the knowledge acquired during the phase of literature review, therefore no practical implementation of this framework has been tested as a part of this work.

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