Diversity is Key!

Audience Diversification as a Solution for Museums

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Abstract

Museums are facing economic pressures and are in dire need to adapt to a new environment in order to stay relevant. These institutions no longer reflect the society in which they are embedded. Moreover, the digital era has changed museum visitor's consumption patterns. Museums are adopting new marketing strategies to become financially sustainable such as audience diversification. New technology has been found to be an effective technique to benefit audience diversification through two specific mechanism: interactivity and connectivity. However, there is no research in how to effectively implement the drivers of these new technologies in a museum context. The research paper answers the question, how are museum experts utilizing new technology to increase audience diversification through the two mechanisms of interactivity, and connectivity? Through ten different semi-structured interviews of museum experts, this research paper untangles the different ways in which the new technology drivers of connectivity and interactivity increase or decrease audience diversification. The present paper findings reveals that museum expert's use of interactivity and connectivity innovates in audience diversification but certain approaches to the use of these technologies may deter certain audiences. This research provides museum experts with future suggestion to innovate in audience diversification.

Keywords: new technology, museums, interactivity, connectivity, social media, audience

Table of Content

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Introduction

Museums are facing multiple challenges in the 21st-century which have reduced museum attendance forcing museums to innovate to stay relevant in our society (Camarero & Garrido, 2012; Minghetti et al., 2002; Weil, 1997). Museums have faced economic insecurity due to government-mandated closure due to the COVID-19 pandemic (Hawkey, 2004). Being closed for most of year 2020, a vast majority of institutions worldwide suffered a revenue loss from the dramatic drop in attendance. The International Council of Museums (ICOM) found that 70% of participants reported a loss of more than 50% of their annual visitors (ICOM, 2021). Beyond the impact of the pandemic, museums are also under pressure to modernize and reach broader audiences. As Secretary Lawrence Small of the museum, Smithsonian Institution Council (SIC) explained already 20 years ago: "We must appeal to new audiences where they live, literally and metaphorically. Otherwise, we will gradually become irrelevant" (Smithsonian Office of Policy and Analysis, 2004, p.2). To address declining attendance and maintain relevance, museums are transitioning from an elitist institution into an inclusive learning space (Macdonald, 2006). This shift towards inclusivity requires museums to cater to diverse visitors of varying levels of expertise in the museum's subject matter.This transition is challenging due to the nature of a museum exhibition being a part of a market of credence goods (Darby & Karni, 1973) and thus high information asymmetry (Akerlof, 1970).

Credence attributes depend on the consumer's expertise level making it more difficult for certain consumers to assess the quality even after use (Smith & Swasy, 1990 cited in Klein, 1988). These consumers who are not knowledgeable about the market of credence attributes could be misinformed and end up believing they have experienced a high quality exhibition while it was indeed a "lemon", a bad quality product (Akerlof, 1970). In a museum context, the failure to correctly inform could lead to consumers to lose their trust towards the museum experience and cause market failure (Akerlof, 1970). Thus, the lack of satisfaction, has a potential repercussions on the purchase of a museum experience. To adapt to the 21st century, museums are facing these challenges and transitioning into a more inclusive space with the hope of increasing audience attendance. Scholars found that museums are increasingly employing new technologies as an innovative marketing strategy to enhance accessibility and create value to their museum audiences (Burton & Scott, 2003; Noehrer & al., 2021). Due to the current economic pressures museums are facing, new technology is a cheap and economically beneficial way to attract and extend the museum's appeal to a diversity of audience members. New technology, therefore, deserves further research as it is an effective and cheap tool for museum experts to adapt their museum to market needs by creating new museum experiences which results in attracting more audience members. While

COVID-19 did accelerate the use of technology, the research will not compare and contrast the pre and post-covid landscape of museums but rather observe how the new technological innovations, which are a result of COVID, has helped museums innovate in audience diversification.

Central to this thesis is the topic of audience diversification in a museum-context, a marketing strategy which attempts to attract an audience which would have otherwise not visited the museum (Bakhshi and Throsby, 2009). Museum's use of new technology in strategic planning and marketing strategies is said to play a big role in helping them broaden their offering in order to innovate in audience diversification (Burton & Scott, 2003). This is due to new technology's ability to provide interactive and visually rich experiences thereby diversifying their audience (Tallon, 2008). These diverse technologies create new experiences, extend the previous one and enhance familiar ones in unprecedented ways. This is achieved through new technology's technical capabilities which creates museum experiences that satisfy multiple needs and interests of a diverse set of audiences (Kocsis & Kenderdine, 2015; Kuan, 2015; Thomas, 2015).

Not only are museums able to reach a global audience with technology but they can offer different types of content to attract previously unreachable audiences. With the greater scope of interactions with the museum collection, technology aims to attract a diversity of audiences, which can allow museums to increase their revenue, as well as cater and represent the current more globalized society (Bakhshi &Throsby, 2009; Camarero & Garrido, 2012; Pietro & al, 2014; Rentschler, 2014). These economic benefits are a result of the ICT feature inherent in these new technologies. Bakhshi and Throsby(2009) paper discusses how museums innovate in using new technology. Specifically, they studied the impact of ICT features on a museum experience and provided the framework which illustrates their innovative capabilities. They identified two ICT features- interactivity and connectivity- that drive audience diversification. The features are defined as such:

Interactivity: Interactivity involves two-way communication between the provider and the audience (Bakhshi & Throsby, 2009).

Connectivity: Connectivity, through social media and other platforms, allows for high-frequency communication (Bakhshi & Throsby, 2009).

This thesis delves in the strategic use of new technology's ICT features driving audience diversification. Previous literature has studied new technology as a whole, neither from its ICT features nor from museum studies or cultural-economics perspective. These studies show that new technology innovates the museum experience and extends the audience reach(Burton & Scott, 2003; Camarero &

Garrido, 2012; Russo & Watkins, 2005). This thesis aims to contribute addressing the gap in the existng literature by explaining the antecedents of ICT features ability to innovate in audience diversification in order for museum experts to appropriately benefit from new technology. To illustrate this, this pape will research new technology's ICT features from an information economics perspective. Therefore, this thesis will answer the question: how are museum experts utilizing new technology to increase audience diversification through the two mechanisms of interactivity and connectivity?

New technology suggests itself to be a prominent avenue of innovation for museums and, therefore, relevant to study. As highlighted by, The Network of European Museum Organisations(2023) and ICOM(2022), new technologies provide vast opportunities for innovation and experimentation in ways museums can forge relationships with their audiences and provide unprecedented access to the public they serve. Additionally, new technology provides new ways in which museums can cater to their audiences, thus, increase accessibility. Technologies and social media are tools to reduce the barriers and equally include different parts of society (ICOM, 2024). Given the museum's economic model, the museum's adoption of digital technology is within their economic capabilities and thus quickly utilized to innovate (Bakhshi & Throsby, 2009). This makes studying the benefits of new technology to increase audience diversification worthwhile as it provides museum experts with cheap and effective ways to help their museum revenue. Thus, technology's economic nature and their ability to attract and engage with diverse audiences makes researching the topic of new technology as a tool to diversify audiences extremely valuable to museum experts.

The topic is not only contemporary but also offers fruitful ways for museums to innovate on multiple levels. First, the use of technology allows museums to innovate in their audience reach in order to be more competitive. New technology offers different museum experiences catering to different audience members, shifting from a "one-size-fits-all" approach around the displayed artifacts to offering diverse services and offerings to generate satisfaction and positive outcomes for their visitors. This practice involves museum practicing visitor-orientation– a strategy where museums emphasize on satisfying its visitors' needs and interest (Camarero & Garrido, 2012; Drotner & al., 2019). Visitor orientation has became a key strategy of museums to satisfy users and increase their intentions to revisit (Di Pietro & al, 2014). The goal is for museums to become more popular and competitive by orienting themselves away from their collection and towards the public. Scholars such as Camarero & al (2015) and Camarero and Garrido(2012) have illustrated how museum's use of new technology helps to increase audience diversification in order to reach new markets and operate under new market conditions. Museums are benefiting from new forms of museum experiences and are strategizing to find their place in an

increasingly digitalised , globalized and changing world by utilising digital technologies to increase audience diversification.

Second, creating diverse museum experiences with different goals is not only essential to compete in the current market. Museums face increased competition from the leisure market forcing researchers to treat museums as part of the increasingly competitive leisure and recreational market (Trinh&Ryan, 2013). This means that museums are competing with not only art and cultural institutions but also television, radio and the internet. Consequently, museums must be "entertainment-oriented" and produce "experiences" which rival others (Packer & Ballantyne, 2016). With digital technology, museums can compete in the leisure market and obtain clear economic benefits. For instance, an immersive museum in Tokyo from the art collective teamlab received more visitors on their VR experience on Van Gogh than the Van Gogh Museum in Amsterdam in 2019. In becoming the most visited single-artist museum and drawing 2.3millions visitors in the first year of their operation(Smith, 2024).

The present paper aims to study the antecedents of the previous stated technology's ICT features in their ability to innovate in audience diversification. By examining these features from an information economics perspective, the research employs key concepts as the classification of goods (search, experience and credence good) (Nelson, 1970; Wollinsky, 1995) and information asymmetry (Akerlof, 1970) to illustrate how museum experts use the interactive and connectivity feature to address the information problem in order to innovate in audience diversification. In studying the interactive and connectivity features, the study aims to complement Bakhshi and Throsby's work.

Museum experiences have credence attributes that refer to a situation where museum visitors are unable to assess the utility of the product (Darby and Karni, 1973). As noted by Smith and Swasy (1998), these attributes depend on the level of expertise of the average consumer(cited in Klein, 1998), leading to consumers relying on experts to compensate for their lack of available information (Darby and Karni, 1973). Technology can help mitigate the challenges posed by credence attributes by providing a democratic learning experience that provides information for different expertise levels. Credence attributes bring about problems of information asymmetry (Akerlof, 1970). According to the theory of information asymmetry, consumers in an uncertain environment cannot screen nor access the right contextual cues to discern a "lemon", a bad quality product, from a good quality product. Technology provides the necessary cues due to their ability to connect with visitors outside of museum walls. In extending the museum experience outside the museum walls, the pre and post museum experience provides museum visitors with a multiplicity of cues which lower the information asymmetry. As a result, visitors that are unfamiliar with museums can obtain information about the potential quality of a

museum experience. The paper concludes by highlighting best practices for museums to use technology to innovate in their audience diversification. By interviewing museum experts in not only their use of technology but approaches to technology, this research can obtain practical knowledge on the best strategies to shape the present information problem in the museum market.

Despite the benefits of technology, it is important to address current concerns museums have on the use of technology before delving into the research. These concerns are important to understand since they influence museum expert's initiative in leveraging digital technology. Critics fear that the implementation of digital technologies in museums could lead to the *'Disneyfication'* of the museum experience and deter museums from their real mission as centers of study and education (Camarero &al., 2005; Macdonald, 2006). Museum directors often struggle with a "Tug-of-war between artistic mission and commercial consideration"(The Economist, 2001, p.65 cited in Toepler, 2006, p.102). Museum experts have to mindfully use the technology to reach the desired balance between the museum's artistic and commercial mission.

1.1 The gap

Insights related to the research are of theoretical and practical implications. The current literature provides a foundation for understanding the ability of museums' to utilize technology to innovate which makes them more economically competitive (Campos & Campos, 2011; Hawkey, 2004; Macdonald, 2006; Nogare & Murzyn‐Kupisz, 2021). First, most of the literature studies museums' impact on innovation in business management, technology and value creation, as a whole. Second, literature studies tend to study the museum as a whole entity or a part of its institutions (size, funding etc.) and its impact on innovation (Camarero et al., 2011). Generally, studies provide evidence that innovation contributes to a museum's enhanced performance Through technological innovation, business management and value creation enhances the museum's economic performance. Certain literature specifically targets museums' approaches to technology to innovate in audience reach. This group of literature studies technology as a whole and its impact on museum education which leads to innovative audiences relationships (Hawkey, 2004). The literature which is at the center of the thesis is Bakhshi and Throsby (2009), They identify the benefits of key ICT features as interactivity and connectivity for museums to innovate in audience reach.

However, the existing literature has limitations. First, studies as Bakhshi and Throsby (2009) identify ICT features that promote innovation but they do not study the antecedents of the features and how museum expert's to these features can affect the extent museums are innovating in audience diversification. Second, marketing and cultural-economic papers study the link between the museum and

innovation as a whole and not on the specific ICT features of technology (Camarero and Garrido, 2012; Nogare & Murzyn‐Kupisz, 2021). Literature in museum studies focuses on technology's impact on the museum educational system that results in the museum's new relationship with their visitors (Falk, 2016) . By doing so, they do not view the relationship the visitor has with the technology And therefore, they cannot improve on their approaches to the technology. Finally, studies on innovation are quantitative, thus they tend to focus on the visitor's use of the technology and miss the museum expert's actual experiences using the technology (Bakhshi and Throsby, 2009; Economou and Meintaini, 2011). This present research seeks to answer the gap present in the previous literature by answering the current research question. While there is sufficient evidence based on field data that new technology as a whole influences museum-visitor relations, there is no field data on Bakhshi and Throsby's conceptual framework of ICT features in the context of European museums.

This present research extends existing knowledge in various ways adding practical value. There is an enormous amount of critical studies looking at the use of technology but this study will look at museum expert's approaches to using technology. Precisely, this study will look at the museum expert's approaches to using technology's ICT features. The use and the approach to the technology's use are two different things. In focusing on the approaches to the technology's use, the research obtains the antecedents to the features of interactivity and connectivity. Providing this perspective extends studies for various reasons. First, in focusing on the museum expert, the research understands how the museum physical, social and political context contributes to innovation and not only the technology and its ICT features. Additionally, in focusing on the specific features of interactivity and connectivity, the research can address how certain approaches to these features could lead to information problems. This perspective challenges current exhibiting knowledge by addressing the complexity in innovating in audience diversification through different approaches to technology. The complexity stems from the information being of different value for different museum visitors. This is done by studying Bakhshi and Throsby's conceptual framework of ICT features in the context of European museums. In doing so, the research can provide an up-to-date picture of the far-reaching potential of these ICT features for European museums.

The contributions of the research hold practical implications for museum experts. These are the benefits:

- **Cheap strategy to increase audience diversification**: Museum experts obtain strategies to increase their audience reach using a tool which is ubiquitous and cheap
- **Provides stronger marketing strategies by solving the information problem**: Future museum experts learn how certain use these features with in mind the full-picture of their outcome. They

no longer view technology as shaping the museum experience of the visitors as a whole but understanding the complexity in obtaining the right outcomes.

These contributions are brought from studying the mechanisms of interactivity and connectivity separately. These findings provide exciting opportunities for museum experts in diversifying their audience base.

1.2 Hypothesis

Based on the current academic literature, the research hypotheses that new technology's interactive and connective features provide multiple ways to engage the visitors with different levels of knowledge and affinity, thus, affecting the potential diversification of the audience. The list below explains in detail how interactivity and connectivity mitigates and reduces credence attributes and information asymmetry (Akerlof, 1970) of a museum experience to increase audience diversification:

Interactivity

=> multiple museum products that appeal to different audiences with different learning affinities

- The feature provides experiences for visitors with different levels of expertise to mitigate credence attributes
- Creating a museum experience with a variety of attributes in addition to the credence attributes. This ensures that consumers gain utility regardless of its credence attributes.
- in mitigating credence attributes, visitors with different learning priorities come to the museum

Connectivity

=> Multiple museum services which extend their appeal to visitors which would have not visited.

- lowers information asymmetry by providing information in the pre-and-post museum experience
- The pre and post museum experience creates a holistic perspective on the museum which sheds light on the quality of their services.
- Visitors from outside beyond the museum's walls. Walls are engaged and invited to come visit the museum

In mitigating credence attributes, the visitors understand the quality of the museum experience. By reducing information asymmetry, visitors gain an increased utility of the museum experience. The model below illustrates how this occurs:

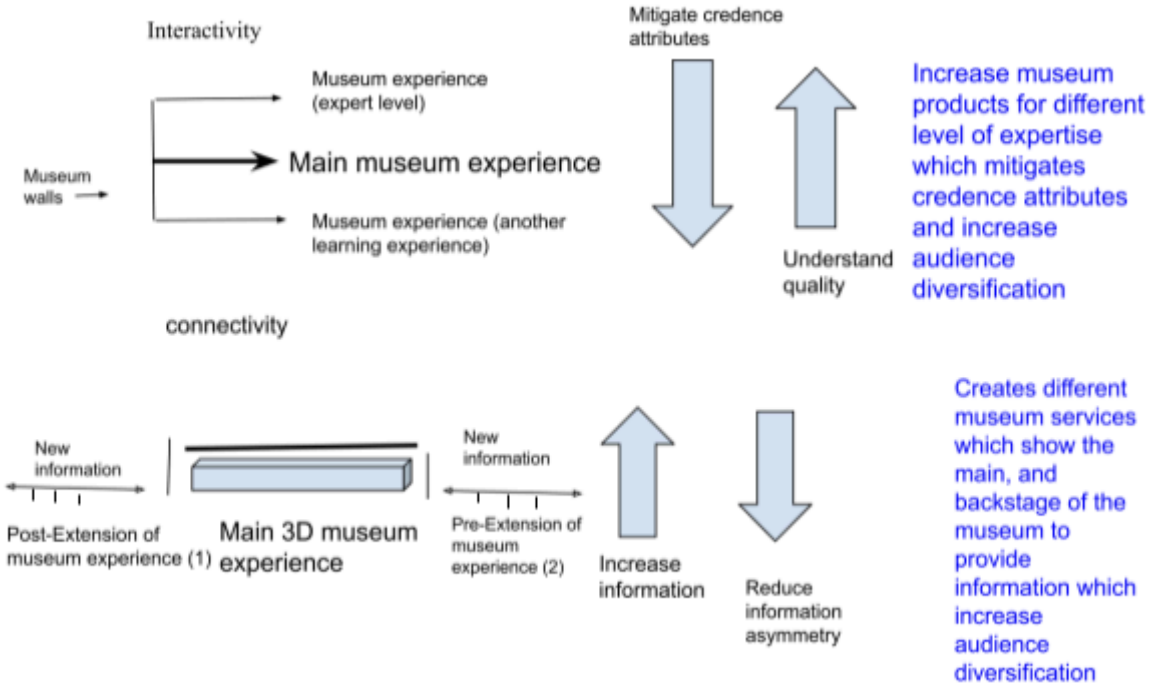

Figure 1: the influence of the feature of interactivity and connectivity on the museum experience in order to affect audience diversification

As figure 1 illustrates, both features have a goal to increase audience diversification by providing different products and services. However, they differ in that the feature of connectivity drives diversification by extending the museum experience outside of the museum walls (S. Boonen et al., 2018; McKenzie, 2008), while interactivity provides alternative experiences which are usually understood as "hands-on" (Economou and Meintaini, 2011; Hawkey, 2004; Macdonald, 2006). In terms of interactivity,

researchers have found that such interactive products create a democratic learning space, driving audience diversification (Campos & Campos, 2011; Macdonald, 2006). This is why there are a variety of museum experiences providing different information for different learning levels. For the feature of connectivity, by implementing the feature, there is an extension of the museum experience through a pre-museum experience and post-museum experience as explained by Ozdemir & Celebi, 2017. This extension creates a holistic, 3D view of the museum. The added perpendicular lines to the post and pre-extension of the museum experience illustrate the added products that inform the main museum experience. These different services increase different visitors's utility, thus, increasing diversification.

1.3 The Research Design

The research's goal is to understand the strategies and practices that museum experts employ, through these mechanisms, to engage and attract a more diverse range of visitors. To achieve this goal, the research conducts ten semi-structured interviews of museum experts in Europe, specifically Belgium and Austria. They were asked open-ended questions in order to gain a more nuanced picture of how museum experts leverage these features to drive audience diversification in a museum context. The interviews were analyzed through a thematic analysis to provide patterns that emerge from the interviews on two key concepts : information asymmetry and credence attributes. The qualitative nature of the research enables us to obtain patterns which quantitative research has more difficulty to obtain.

To do the research, the scope of research will specifically focus on audience diversification in museums in Belgium, France, and Austria due to the researcher's time limitation. The research on audience diversification remains relevant for both countries. Belgium's Federal museums are not diversified as they are visited by 80 % highly skilled visitors meaning that they have post-secondary or a university degree. Most of these visitors are experienced Museumgoers, being visitors that visit a museum at least 3 times a year (Belspo, 2024). While Belgium museums lack diversity, Austria's reputation as a tourist destination makes their museums popular. However, the Austrian museums are affected by the rapid social and technological changes that are modifying their mission and in that, implies an adaptation to the needs of a wider array of users (ICOM, 2020). Compared to previous countries, France holds a philosophy that culture should be for everyone. France is emblematic of a country that aims at innovating in audience diversification within their cultural institutions because they practice democratization of culture (Compendium, 2023). Analyzing museums experiencing a need for innovation in audience diversification, this research obtains a more holistic picture of the current museum context. The research will also discuss the different target audiences that museums are attempting to attract. Therefore, the findings of the research should be read with the scope in mind.

More generally, while literature hails technology and its ability to innovate in audience diversification, they do not explore the issue deeper. The findings complement current literature by providing a more complex and nuanced picture of how new technology is attracting and extending the appeal of museum visitors. , the research found that the features of interactivity and connectivity do drive audience diversification in reducing credence attributes (Wolinsky, 1999) and information asymmetry (Akerlof, 1970) respectively. However, the features ability to improve the current information problem does not affect the audience as a homogenous group. For instance, interactivity features lowers the credence attributes of a museum experience for the younger generation but solely when experienced with a technology. This is due to the technology failing to contribute to the overall museum experience and focusing on digital mediation as a tool to diversify the audience members. In terms of the connectivity features, the museum can use search and experience attributes to lower information asymmetry and thus attract a diversity of audience members. The research will show that museums can ineffectively use experience attributes which can have repercussions on their diversification goals. The results of the research shows that these features may diversify the audience members of a museum but must be mindfully utilized.

The thesis is organized as follows: Chapter two will review the literature on new technology and its impact on audience diversification. Chapter three explains that the research is conducted from a qualitative perspective by using semi-structured interviews. Then the research analyzes the data from qualitative interviews in order to dissect these drivers in a museum context. Chapter four dissects how these drivers have increased or decreased audience diversification. Chapter five will explain the discussion and conclusion. The chapter explains how the two features shape information for certain target audiences but certain approaches to these features create information problems. This discussion provides a conclusion to explain what aspects of these drivers actually contribute to audience diversification. Finally, by answering the question, museum experts can best understand how to effectively utilize the drivers and help the museum adapt in an increasingly competitive and digital world.

2) Technology increases audience diversification

Chapter one introduces how the museum's utilization of digital technology to innovate in audience diversification has benefited the cultural institutions' economic performance. Despite the known benefits, there is a knowledge gap regarding key drivers of audience reach. This raises a question about how museums are utilizing these key mechanisms of interactivity and connectivity to extend their appeal

to a diverse set of audiences. It remains unclear how to appropriately utilize these mechanisms to shape the museum experience in order to drive audience diversification.

The current available literature identifies this gap, partly as a result of COVID-19, which accelerated digitalisation practices in museums. During the pandemic, museums adopted these technologies to enable virtual visits and exhibitions, despite the lockdown (Dosen & Komarac, 2022). These new digital technologies have facilitated the administrative practices of museums and extended their appeal to engage as well as address the pedagogical needs of diverse audiences that would otherwise not visit them. However, there is limited knowledge about how these ICT features affect audience diversification in practice in order to obtain advice for museum experts to replicate the results.

To gain a clearer understanding of museums' features that drive innovation in audience diversification, Chapter 2 will review literature from multiple fields of study. This chapter will introduce, link, and briefly explain the main concepts necessary to answer the study's gap. The primary aim of this chapter is to develop a theoretical foundation which would serve as the lens guiding the analysis. Then the literature from museum studies will contextualize the museum in a post-COVID world and show that despite financial difficulties, digital technologies can help museums adhere to their mission of educating a diverse set of audiences (Bakhshi & Throsby, 2009). The literature will delve into the concept of new technology and the diverse types of new technology that are utilized by museum experts. Additionally, scholarship from museum studies, marketing and visitor studies sheds light on how technology is an answer to audience diversification (Anderson, 1999; Camarero & Garrido, 2012). Then, to identify the antecedents of audience diversification, marketing and cultural economics studies provide a useful perspective on how audience diversification relates to the marketing approach through information economics (Nelson, 1970; Sundbo &al., 2008). The literature will inform the previous strategies museums have put in place to diversify their audience and help give a firm background understanding of how museums are defining the key strategies to promote the diversification of their audience. The research will primarily focus on new technology and its impact on audience diversification (Rentschler & Gilmore, 2002; Camarero & Garrido, 2012). This paper will not focus on digital innovation's function in the museum's administrative benefits. Thus, the literature review will help answer the research question: how museum experts use new technology to increase audience diversification through the three mechanisms of interactivity and connectivity?

2.1 Definition

This section will clarify the definition of museums and their relationship with new technology. Understanding this definition is crucial because museums have undergone significant reshaping due to both internal and external pressures. In response to these pressures museums have fundamentally altered their function, becoming more market-oriented. These pressures include widening their appeal to attract a larger and more diverse range of visitors due to tight budgets, increased competition and changing consumption habits in order to become more economically resilient. A background context will help clarify the museum definition by contextualizing the environment in which museums operate.

2.1.1 What is a museum in the 21st century

The museum definition has repercussions on its functioning and purpose. Clarifying its definition is crucial to understanding how museums are adapting today. Museums are a heterogeneous market but they agree on one thing: museums should converse, communicate and exhibit (Ginsburgh & Mairesse, 1997). This common agenda is detailed by The International Council of Museums (ICOM) a non-governmental organization, founded in 1946. The most recent is from 2022, adopted by the 22nd General Assembly in Vienna, Austria:

> "A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing" (ICOM.museum, 2022).

This definition combines the museum's traditional, functional role with a new purposive role (Weil, 1990; Thompson, 1998). The functional role emphasizes museums as collectors, conservators, and places where people can access humanity's heritage. The museum's purposive role incorporates progressive terminology such as "diversity", "sustainability", "accessible and inclusive" (Villa, 2022). Contrary to the functional role of the museum, the museum's purposive role places importance on the museum's audiences instead of the objects. As Tinh and Ryan (2013) state, the definition now incorporates terms like "enjoyment", which emphasizes that the visitor's satisfaction is a part of the museum definition. If a museum follows these new functional and purposive roles, they are considered to have the "backbone" of what it is to be a museum.

Although the museum definition is non-binding, the definition encapsulates the essence of what constitutes a museum. It is viewed as a framework to be followed to various degrees. In the context of this flexibility, museums are expected to preserve their countries' heritage while satisfying contemporary visitors' needs and desires (Kotler and Kotler, 1998; Chong, 2002; Boylan, 2004) that brings about various challenges in practice. They fear that by trying to satisfy their consumers, they will dilute their primary goal, which is conserving the culture of our society (Camarero & Garrido, 2012; Villneuve, 2013).

By understanding the current agreed upon museum definition and how it now encompasses a museum's functional and purposeful role, the definition provides a framework for the case studies which will be analyzed. Moreover, by clarifying the museum definition, the underlying goal which ties all museum experts is understood. While modernizing their museum using technology, museum experts' goal is to conserve their initial mission as safeguards of their nation's cultural heritage. Museum experts have a goal to preserve their museum mission that will impact their approaches to technology and make their approaches unique to their context.

2.2 New Technology

Museums are combining their traditional role with their purposive role through the use of new technologies. These institutions are doing so to meet the unmet customer's needs that has led to new marketing strategies from the use of new technologies. New technology is a part of these marketing strategies since they are viewed as tools to bring in and retain audiences. They offer a diversity of museum experiences that enable them to meet the needs of different museum audiences. As highlighted by The Network of European Museum Organisations(2023) and ICOM(2022), digital technologies provide vast opportunities for innovation and experimentation to help museums forge relationships with their audiences and provide unprecedented access to the public they serve. According to **Bakshi** and Throsby (2010), digital innovation is the most effective way to increase audience reach. Given the museum's need for financial stability, museums have integrated with the ICT sector to implement these new technological innovations in order to reach new markets and operate under market conditions (Camarero & al., 2015). Museums strategized to find their place in a new world using new technology to innovate in marketing strategies.

Cultural heritage and museum professionals must adopt new technology in order to remain attractive to their visitors and cater to a more interconnected world (Camarero & Garrido, 2012; Rentschler&Gilmore, 2002). The adoption of these innovations reflects changing environments, particularly in light of the economic downturn experienced through dwindling public funds, the pandemic

crisis and changing social tastes (Camarero & Garrido, 2012; Johnson & Thomas, 1998; Scott, 2011). Currently, the use of new technology is viewed as permitting museums to become economically sustainable in securing greater independence from government funding (Nogare & Murzyn-Kupisz, 2021). The prior stated circumstance in that museums are facing shed light onto why museums in this study would be eager to adopt technology.

The section will define and detail the types of technology used and its importance at the heart of exhibitions in order to gain a sense in what museums are using as innovation in order to become economically and socially sustainable.

2.2.1 New technology

Technological innovation is an essential concept to define since it benefits museums in developing their purposive role and more precisely expanding and sustaining their audience base. Despite new technology being ever present in the museum world, little is known about the various ways in which these institutions engage with, adopt, and contribute to processes of innovation. This section will clarify the different technologies that will be a part of this study. In doing so, further understanding in how they increase museum visitation can later be detailed

2.2.1.1 DIY photography, video games and databases

Museums in the research used photography and video games which have interactivity features. These mediums' interactivity features are defined as being " hands on" or "Do-it-yourself", therefore, visitor create a product with the goal of gaining a deeper understanding of photography, video games or improving the museum's archive. The paper does not look deeper into these technologies as they are considered to be so well known that no further description is necessary.

2.2.1.2 Augmented Reality

As computing technology becomes more powerful and portable, museums are deploying new forms of technology as augmented reality (AR). AR is receiving a lot of attention because it is easily implemented in exhibitions via the audience's smartphone or tablet and in many respects is qualitatively different from earlier technological advancements. Museum audiences point their phone or tablet to an object as per personal preference and see a video through the phone's lens. The video can explain the object's history, receive an AR view of the building in another year, gain 3D enhanced narrations and

more (Keil & al., 2013). Generally, AR provides supplemental information about the exhibit or the museum itself (Ding, 2017). AR enables museums with the means of offering new museum experiences. According to Ghouaiel & al (2016), the most sought experience by museums is to use AR to create a learning experience. A learning experience is defined by letting audience members learn in a voluntary, free way, guided by their own personal preferences (p.21). These learning experiences are offered on-site and off-site through the visitor's phone. Although museums can now attract visitors through their use of their own personal phones, the institution remains as important as it was in providing a fixed site where visitors can view the museum's collection.

2.2.1.3 Mobile phones and social media

Over the last years, museums are increasingly using social media. They are found on platforms such as Instagram, Facebook and Youtube. Each platform holds their own characteristics which benefit the museum in different ways:

Facebook is a website and mobile app. It is used as a one-way instrument of promotion and publicity (Lazzeretti & al, 2015). Museums can create a page where they post where they are located and their upcoming events. The page has followers which are people who subscribe in order to get information related to the museum. The followers can also message the museum and obtain information about the exhibition of their wish.

Instagram is a website and mobile app. On Instagram, museums create a profile where they communicate about their exhibition through photos (Weilenmann & al., 2017). Under these photos, followers of the profile can communicate and share their impressions of the photo which is called engagement (Barger& al., 2016). Each photo posted can be automatically posted on Facebook if they choose. They can create "stories" which are photos that last a few hours before being deleted.

Youtube is a website and mobile app. Each YouTube user, as a museum, has a channel and each user can subscribe to other channels or gain subscribers. If one subscribes to a YouTube channel, they obtain updates on the new videos posted by the channel's owner. In terms of museums, museums will create a channel and create cultural content videos. Videos with likes, comments, high number of views and shares are considered to have high engagement. In terms of museums, museums will create a channel and create videos in terms of their content (Barger& al., 2016)

All of the above are found on smartphones and in the form of apps. With the popularization of mobile phones with both a camera and internet, the always online nature of smartphones, users of these apps facilitate social interaction through these multimedias. This is because they all have features that facilitate experience-sharing through users sharing comments, tips, photos by tagging (process of notifying the museum that they are a part of the photo) and questions about exhibits and artifacts (Tsai & Sung, 2012; Weilenmann & al., 2017). This engagement is characterized as a "community". And by creating a "community", museums view communication on these platforms as " a process of transmitting ideas across space from a knowledgeable information source to a passive receiver, to a constructivist approach wherein communication is understood as a process of sharing, participation and association" (Hooper-Grenhill 1999, p69 cited in Lazzaretti & al., 2015, p.269). The formation of online communities on a museum platform increases visitor's satisfaction of the museum experience (Lazzaretti & al., 2015; Palumbo & al., 2013). The previous section detailed different types of technology, now they will be understood as tools of innovation for audience diversification.

2.3 Technology as an answer to Audience diversification

The previously described technology provides museums avenue of innovation in audience diversification. Before delving into the far-reaching potential of new technology's ICT features in opening enormous possibilities of innovation in how cultural industries relate to their clients, this subsection will explain the type of innovation which will be studied in this research - audience diversification- and why it is a pertinent innovation to pursue. This paves the foundation to understand the use of technology as a tool for marketing strategies to pursue an avenue for innovation in audience diversification.

2.3.1 Defining audience diversification

Cultural industries, as museums, are pursuing innovation since it contributes to economic performance. Authors as Bakhsi and Throsby (2009, p.17) identify avenues of innovation by museums:

- Innovation in value creation`
- innovation in art form development
- Innovation in business management
- Innovation in audience reach

There exist a range of studies that address these topics. This section provides a critical overview of audience reach as an avenue for innovation in museums using technology. First, defining audience reach is essential since it is a concept which can be interpreted in three different ways:

- Audience broadening: Capturing a larger share of the population which are considered traditional participants but are currently not attending (Kotler & Kotler, 2000).
- Audience deepening: intensifying the current level of participation by the current visitors. (Kotler & Kotler, 2000)
- Audience diversifying: attracting new groups of consumers who would not otherwise attend (Sandell, 1998)

Innovation as a means for audience diversification in a museum context tends to involve creating new programs and fostering new partnerships. ICOM (2019) has significantly contributed to museum diversification of the audience base. They push new policies for museums to link themselves with communities. These new partnerships take shape in the forms of democratic spaces of intellectual exchange with different types of communities. Promoting the museum collection amongst the marginalized communities and by making the museum collection more known. ICOM (2019) suggests different museum experiences to diversify the audience base. They suggest that museums should receive funding for social projects, have space available outside the museum to invite different museum visitors and discuss the need for different museum experience within a broader local development strategy. We observe the immense political, economic, and time investment in creating a new diversified audience base.

Although diversifying an audience base poses challenges, this present research will focus on audience diversifying. Literature views audience diversification as a solution to the economic downturn resulting in tightening of state funds and decreasing museum attendance (Weil, 1997; Minghetti et al., 2002; Camarero&Garrido, 2012). Innovation in audience diversification is a solution because it addresses audience's needs and interest in new ways (Lindelof, 2015). In a larger context, museums need to reflect a new globalized world which audience diversification permits. These external and internal changes have resulted in museums adopting new strategies to innovate in audience diversification which diverge from the traditional ways of working and seeking new management styles (DiMaggio & Power, 1983; Glow & al., 2021). The external and internal pressures faced by museums makes innovating in audience diversification a relevant marketing strategy to utilize.

More interestingly, the research will delve into extending audiences in the use of new technology. Technology finds itself a relevant tool to study since museums are competing in a world which is increasingly digital, thus, reshaping visitor expectations. Museum experts must leverage technology to

modernize their products to reach new audiences and remain competitive. The following section will consider the broader competitive landscape that museums face today and how technology can help them adapt to new demands and cater to audiences which were previously underrepresented in their institution and underserved.

2.3.2 Technological tools to increase museum competitiveness in a changing world

The use of technology holds features which make them the tool of choice to increase museum's competitiveness in a landscape which is demanding new forms of consumption. These evolving forms of consumption are a result of the museum's increased competition, accelerated by the digital era, with the leisure and holiday market place. The leisure and holiday market place provides an abundance of goods and services they provide which museums could previously not compete with (Trinh & Ryan, 2013). Coupled with that, the digital era made information retrieval instant which made visitors demand for the same efficacy. Technology is a perfect tool to answer these pressures by its ability to supply a diversity of goods and services which cater to different consumption patterns in an economical way. In turn, this innovation in technology helps to attract and diversify their audience base by providing products and services which answer their diverse demands.

The need for museums to innovate in technology stems from the changing consumption patterns in part resulting from the digital era. The changing consumption patterns are a consequence of an increased computer ownership, internet access has created an easy access of entertainment and leisure outside but also inside people's homes. The access of leisure at one's fingertips have grown exponentially in the past 20 years and changed museum's visitors ' consumption of museum exhibitions (Burton&Scott, 2003; Shehad&al., 2020). Burton and Scott's survey (2003) found that home computers would impact visitors' attendance. The survey also indicated that the technology at hand could significantly impact the younger generation's expectations in terms of information retrieval and how they deem artifacts significant. This meant that these younger consumers were searching for new ways of consuming a museum experience, one which competes with the leisure market. Technology could help produce museum products and services which rival the leisure market and attract a younger generation.

Generally, the body of literature view museums as public spaces of consumption, where visitors consume the exhibit through 'visual consumption' of exhibits (Jafari & al., 2013) but the younger generation are demanding alternative forms of consumption. Burton and Scott's research found that young museum goers felt that museum visiting required a lot of effort, considering this, the younger generation needs different forms of consumption than aesthetic consumption (2003). Indeed, visitors demanded

experiences where they can actively participate (Trinh & Ryan, 2013), instead of being passive observers of information. There are multiple examples of museum strategies to answer these demands , such as Interactive computer games which encourage visitors to mindfully explore the information, while keeping static display for other types of consumers (Goulding, 2000). In this example, technology is seen as an effective tool to answer the younger generation's consumption habits in a museum. For the older generation consumers, they have experienced the museum differently to the younger generation. Contradictory to the younger generation, technology did not play as much in their museum experience. Instead the older generation enjoyed other means of product consumption such as spaces to socialize (Goulding, 2000). These challenges have required marketing knowledge to enhance the museum value proposition to audiences which are not part of the core traditional group such as the younger and older generation. In the present climate, the need to understand the nature of a museum experience has never been greater. Museums are having to diversify their museum experience to attract and extend their appeal to new audiences which previously have been in minority.

The digital era has also created an underlying social factor that museums have needed to tackle and contributed to changes in consumption. In an increasingly connected society, museums can no longer cater to their traditional core visitors, but they must adapt to a new consumer base who has new consumption patterns. The American Association of Museums (AAM) explained that decreasing museum attendance is not solely a question of visitors losing interest due to the increased competition museums face in the leisure market but also the lack of engagement with communities who would otherwise not visit a museum. For instance, they found that museums served 9% of minorities in 2005 (Farrel & Medvedeva, 2010, p.5). All the above shows a consumer's shift in consumption patterns are symptomatic of an ever increasingly digitized society(Anderson, 2012; Rea, 2019,artnet). These worrying statistics prompted the AAM to encourage museums to focus on audience diversification. Although this study is based on American data, similar trends are observed worldwide.

By acknowledging and addressing these trends, museums can create more inclusive experiences that resonate with a broader audience. Digital technology can help address these new problems. However, there remains debates surrounding the implementation of digital technologies for audience diversification. The following section shed essential light on museums' use of technology. It is not a straightforward narrative.

2.3.3 The difficulties and concerns of digital technology for Audience diversification

The use of technology in museums has had an innovative impact on their ability to reach new audiences. The inherent features of new technology create services and goods that can cater to a diversity of tastes, thus increasing audience reach (Bekar & Haswell, 2013). For instance, museums have utilized the far reaching capabilities of new technology to implement activities, that otherwise would have been impossible, such as off-site apps allowing museum visitors to learn about the museum not within the walls. This enhances the accessibility of the conveyed information in museums (Hawkey, 2003). Additionally, technological innovation has provided opportunities for museums to answer the new consumption patterns of their customers brought on by the digital era. Museums have applied technological innovation to provide innovative presentation and interpretation techniques that suit their consumers' new consumption patterns and their interest in "experience"(Kotler & Kotler, 2001). Technology's inherent features create a paradigm shift from museums being "user-centered" to "audience centered". The internet offers many opportunities to recontextualise the museum's objects. As a result, the museum can offer differentiated content for different users which range from non-professionals to amateurs. Consequently, museums are now addressing users' diverse needs and providing differentiated exhibitions and characteristics (Meng & al., 2022).

The audience-centered approach to implementing digital technology has brought up a debate among museum professionals (Meng & al., 2022). The debate is centered around how to appropriately implement digital technologies. Museum professionals advocate for digital technology and new media for its promise in innovating audience reach which books museum attendance (Navarrete, 2019). Digital technology helps to democratize knowledge, reach new audiences from all backgrounds, and offer a learning experience that suits the audience's pedagogical needs. Despite these promises, critics view digital technology as atomising visitors, in other words alienating visitors from each other (Witcomb, 2006). Potentially, visitors would prioritize the technology itself instead of the artwork itself. Moreover, critics note that the deployment of technological innovation may incur higher exhibition costs and detain the flow of visitors for popular items (Navarrete, 2019). However, others would argue that its implementation could also help the museum preserve its initial mission by paying greater attention to its management and display of artifacts (Borowiecki and Navarrete 2017; Sheng & Chen, 2012; Hess, 2017). Both positions are grounded in experience but they do not distinguish the types of new media used and most importantly the solutions museums can put in place so as not to experience these limitations. Museums need to sustain themselves and by finding and analyzing the drivers of innovation in digital technology, museums can better implement these drivers and overcome the limitations of digital technology to gain its benefits.

While approaches to implementing technology are contested, there are also barriers in terms of resource availability for technological innovation in audience diversification. Implementing digital technologies in museums can be expensive and not accessible tools to everyone (Evrard & Krebs, 2018). In developing countries, museums face barriers due to a digital divide- meaning that there is *inequality in access to hardware, software and/or internet* (Mihelj & al, 2009, p.1469). The Digital divide could have repercussions on museums' ability to access visitors that are outside their core audience. Scholars Frey and Meier (2006) found a correlation between innovation in museums and size. Museums have to innovate and provide experiences that relate to and attract larger numbers of people. However, Frey and Meier's study(2016) suggest that larger institutions are not needing to innovate because they already attract a larger audience that requires small- and medium-sized museums to compete with their bigger competitors. Given these needs, medium-to-smaller museums are investing in social media and websites at an earlier stage than their larger counterparts. Along the same lines, Navarrete(2019) sees larger museums as having the resources to innovate but not doing so due to bureaucratic obstacles. She also notes that medium-to-large museums have adapted with innovation to the competitive environment faster to expand their customer base. They have done so with smaller investments as social media due to lacking the resources to investigate larger ones (2019). Social media are known as cost-efficient marketing strategies due to their low sunk cost and lower cost of creation (Kirtiş&Karahan, 2011). Final point, in the thesis's research, size will be touched upon because it has implications on what technological innovation they have invested in, however, the concept of size will not be given further attention

Social media shows itself to be a cost-effective tool to help smaller museums remain competitive. On the one hand, while larger cultural institutions have resources to innovate, the bureaucratisation behind implementing these new initiatives stops them. Regardless of their initiative, these museums are experiencing higher attendance than smaller museums as a result of their collection being built from well-known works. On the other hand, smaller organizations may not have the resources to invest in larger investments but will innovate in their use of social media or website presentations with greater frequency than larger museums (Navarrete, 2019). Smaller museums' incentive to innovate is, especially, a result of the cost structure of museums favoring bigger institutions. Instead of updating the actual museum visit by organizing blockbuster exhibitions which they do not have the means to, museums have found social media and the internet as a way to expand their customer base (Frey & Meier, 2006). In that, social media remains an interesting platform to study in the context of audience diversification as it is utilized by all museums.

As addressed, innovation in audience diversification can differ between museums as a result of their size and resources. By focusing on the ICT features rather than the technology in itself, it offers a

more actionable understanding. If the research were to focus on the technology/platforms, the museum's size and resources would be factored into the technology itself. The next section will delve into how these ICT features drive audience diversification.

2.3.4 Innovation in audience diversification

The most radical and interesting avenue of innovation in audience diversification is the use of new technologies's ICT features, enhancing content within collections in various ways, therefore, attracting a variety of visitors. In offering a range of interpretations in which visitors can understand and comprehend the content, museums democratize and customize the museum experience to visitors (Koukoulis & Koukoulis, 2016; Shehade & Sylianou-Lambert, 2020). The endeavors would have the consequence of widening the museum's access and target their audience base outside of its core visitors- hence audience diversification. The enormous possibilities offered by technology capabilities make it an interesting avenue of study. New technology's ability to diversify its audience comes through its ICT features. Scholars such as Bakshi and Throsby(2009) view interactivity, connectivity and convergence as drivers of audience reach. They do not study these drivers' influence on audience diversification. This section will define these ICT features but reevaluate and create a new set of drivers of audience diversification.

Clearly, technology impacts the audience diversity in museums. A few features of technological innovation are studied as drivers of audience diversification. Bakhsi and Throsby analyze three ICT features:

Interactivity- deals with the different creative services that consumers can modify or participate in which are provided by the museum or gallery (Bakhsi &Throsby, 2009).
Connectivity- refers to the diverse array of technologies utilized by the museums which permit high-frequency communication between and amongst providers and users of cultural services. For example, social media, twitter, blogs;
Convergence- refers to the ability of audiences to access information about the museum outside or inside its walls wherever it is convenient and appropriate. The use of museum apps and museum websites enables museums to provide information beyond their walls (Schavemaker, 2011).
(definitions adapted from Bakhsi and Throsby, 2009, p.19)

The thesis will research technological drivers of audience diversification starting from the previous framework but will not include convergence. Convergence was not included due to its presence in connectivity.

The term connectivity needs to be fleshed out to first understand why convergence is a part of its definition. The term connectivity is related to new technical development of the internet and digital innovation. As Drotner and Parry (Anderson, 2018) discuss, these technical developments and digital innovation reconceptualised the museum's experience. More than ever, museums have access to a diversity of technologies which create new experiences, extend the previous one and enhance familiar ones in unprecedented ways(Tallon, 2008). These experiences are mediated through the different platforms which interconnect the provider and user around the world. With more interconnection, the museum visitor was no longer the visitor inside the museum walls but the one which followed their website or followed them on social media and interacted with them (Anderson, 2018; Lord, 1999). The museum audience is now understood through a matrix of perspective, being the visitor online, on-site or visiting remotely. Thus the concept of convergence comes into play where visitors are able to gain access to the museum experience and thus knowledge and information of the museum on-site or off-site.

2.4 An Economic Lens to audience diversification

Through the lens of Information Economics, the thesis will shed light on how museum experts adopt the key ICT drivers of technology to increase or decrease audience diversification in a museum context. The branch of information economics studies how information impacts our economic decisions (Nelson, 1970). In a world where consumers are saturated with information due to the advent of the internet, ICT features aid museum experts in shaping the information in ways which suit the needs and interest of diverse audiences. By museums taking advantage of these ICT features of digital technology, museums can use technology and cater their product to the target audience and increase their audience

diversification. This section will help ground the thesis in the theoretical framework of Information Economics .

A museum experience is characterized by significant transaction cost in part The Nobody Knows principle. The Nobody knows principle makes it difficult for museum professionals to predict consumer reactions to a new product which they supply (Caves, 2003). This principle is exacerbated by the experienced uncertainty between producers and consumers which is understood as information asymmetry. Consumers need to objectively or subjectively access enough cues with the available and trusted information to adequately compare the product to other ones and make an informed decision of its quality. Information asymmetry is a source of market failure if the uncertainty is not properly organized in order to obtain a return. In recurrently buying bad quality products because the consumer does not know the quality, the market will deteriorate. Suppliers can mitigate this problem by providing adequate information to their consumers.

Uncertainty about the quality of a museum experience is very pronounced due to various factors. First, the museum sector is heterogenous by nature. Each museum provides a different experience due to the museum's interest (archeology, history or more) and their differing collections (Hawkey, 2003). While consumers can compare the museum's hedonic characteristics including their name as a museum, exhibited artist in the collection, types of collections, this is not enough. The value of a museum experience does not only derive from attributes but from subjective qualities such as the consumer's knowledge acquired, entertainment experience or ability to discover something new (Falk & Dierking, 1995). Moreover, the quality of these subjective qualities are associated with the visitor's taste formation. A visitor's taste formation is the current preferences. These current preferences derive from a lifetime of relevant experiences from similar products, accumulate at that point in time and drive their future perspective and preferences on their cultural consumption (Ginburgh & Throsby, 2006). This results in each visitor holding differing preferences which results in market risk. Uncertainty is experienced on the supply side since they need to generate demand in a market whose history of preferences is unknown. Needless to say, tastes are difficult to predict since they may change. As a result of all these factors, museums are susceptible to large information asymmetries with respect to quality.

Museums use marketing, management, and communication strategies to reduce the information asymmetry. Traditional models of economics explain that marketing, management and communication strategies provide consumers with information so that they can assess the quality of the product. In Nelson's account (1970, 1974), the consumer can search for pre-purchase information until the marginal cost of their search equals its marginal benefit. Different products will influence how consumers achieve marginal benefits. Nelson(1970, 1974) classified the type of products into three categories: search and

experience. In addition to the latter, there is a third product - credence goods/services (Darby & Karni, 1973). Depending on the good's category, the consumer estimates the utility of the good differently.

- For search goods, a consumer estimates the utility of a good by acquiring information prior to purchasing it. Search information is anything which is objective, diagnostic and can be easily compared to other objective information (e.g. price) (Huang & al., 2009). The overall-risk perceived in buying a search good is low (Girard & Dion, 2010). Huang & al. (2009) argue that the internet enables consumers to learn from one another, electronic word-of-mouth (e-wom), and gather information which would be difficult to obtain off the internet. For instance, a consumer can offer information about the experience which previously would have needed to be experienced. This makes certain attributes of an experience, a search good.
- In terms of an experience good, the consumer gains information via experiencing the product (Towse, 2011). Consumers need to try in order to reduce the uncertainty before purchasing the product (Girard & Dion, 2010). Only one type of "experience good" will be studied which is called the experience-2 product in Girard & Dion's study. An experience good as such is usually as a result of the consumer not having the knowledge and experience of such a good (Girard & Dion, 2010). This type of "experience good" reflects the context of this study as museum visitors hold different knowledge on the museum experience.
- When buyers cannot assess the quality or utility of a product after purchase, these products are termed credence goods (Darby & Karni, 1973). The concept is dependent on the credence given to these goods by others. The "others" are the experts who create the goods such as the designers, distributors or the consumers known as "influencers" (Giacalone, 2006). Moreover, the individuals that consume the credence good play an important role in influencing people to visit the museum (Kotler & Kotler, 1998). Credence goods are characterized by large uncertainty due to consumers being potentially unable to acquire utility, thus, the expert can either exploit information asymmetry (Dulleck & Kerschbamer, 2006). However, the expert is also an essential actor in providing the consumer confidence in the product they consume and provides the verification of the credence good status (Ekelund & Thornton, 2019).

Typically, goods are a mix of search, experience and credence attributes. There is a combination of all these attributes. The common cited example is a wine bottle. Certain attributes of a wine bottle as the design can be evaluated before a purchase and therefore represents its search characteristics. In order for

the consumer to taste the wine, they need to buy and consume it. This makes the wine taste an experience attribute. The information of the label which refers to where it was processed is not easily verifiable and therefore constitutes a credence attribute (Gottschalk, 2018).

2.4.1: An Information-Economic Analysis of a Museum

In terms of museums, museums offer their audiences or customers a museum experience once they have bought their ticket. A museum experience offers a variety of products. These products have multiple quality attributes which are a conglomeration of the various stated products. The next few sections briefly consider these attributes within the general museum context.

Search attributes: A museum experience can have search attributes as artist names, date of exhibitions, activities, workshops; exhibition, curator and museum name. In addition to information which is found via marketing and communication strategies, authors as Klein (1998) have suggested that the rise of the internet has made it even more easy for consumers to gain information from the experience of authors and in this instance on the museum experience. This is seen through the dissemination of the museum's collection on platforms such as Youtube, Facebook and Instagram. Consumers can now obtain information outside of the museum walls and within the comment section of these pages. These platforms congregate all the museum's word-of-mouth in the comment section of these pages, enabling consumers to have less search cost. The internet has changed the attributes of certain goods. "Experience goods"become "search goods" as a result of the internet. As Kirmani and Roa(2000) and Huang & al.(2009) suggest, the consumers obtain information from others and gather information that is difficult to obtain in an offline setting.

Experience attributes: New technology enables museums to put different perspectives and educational learning points into digital format. Content can now be viewed in a static form but as an "experience" in itself(Kocsis & Kenderdine, 2015; Kuan, 2015; Thomas, 2015). In creating content which becomes an "experience", museums are no longer sites with the authority on a singular perspective but one of interpretation(Walsh, 1992 cited in Sundbo & Darmer, 2008). This discussion is not to point to the variety of interpretative possibilities but rather to the fact that museums affordance of a variety of interpretation is due to the materiality of the technological features. Inherently, these digital technologies, due to their digital aspects, expand the supply and variety of goods. Primarily, museums benefited from the features of connectivity in social media to produce "experience goods".

The adoption of social media platforms added another experience to the museum experience in itself by either extending or enhancing it. Cultural economists consider cultural goods an "experience good" (Blaug, 2001; Krueger, 2005). They are an experience good because their consumption, although temporary, is necessary to understand the quality of the good and the utility gained from the consumption. Scholars argue that certain online experiences are a pre-experience good. A pre-experience good allows the user to get a sense of the real product before making a purchase online (Xu &al., 2019). In the context of a museum, the online experience allows the consumer to evaluate the information before buying their tickets online. The status of a cultural good as a museum experience being a "experience good" is debated. Some scholars view a cultural good as a "credence good" (Ekelund & al., 2020).

Credence attributes: Museum's credence attributes are from the quality, provenance, authenticity of the art or the exhibition in itself. For Smith and Swasy (1988), they expanded on the credence attributes as depending on the level of expertise of the average consumer (cited in Klein, 1998). Gaining expertise in museums is often informed by the consumer's cultural consumption experiences of the museum experience. If the visitor has not consumed a museum experience in the past, their knowledge of the museum experience might be limited. If a consumer visits museums and consumes them, they gain knowledge of the topic and obtain a preference for visiting them (Katz-Gerro, 2004). Therefore, mitigating credence attributes is difficult since a consumer's past cultural consumption, their expertise on the topic, will inform their preference and understanding of a museum experience.

Despite the consumer's knowledge, they buy/consume goods with credence attributes. Scholars like Zorloni (2013)discuss these aspects of credence goods in the context of contemporary art. They explain the concept of a trust good. A trust good has qualities that are not assessable prior to nor after purchase due to the lack of technical and cultural knowledge. Bonus & Ronte (1997) define credence goods as having cultural quality. In having cultural quality, these goods can only be evaluated by their specific type of cultural knowledge. Lupton (2005) calls this an "indeterminate good", a good whose quality is uncertain for everyone except the artists themselves. While certain scholars suggest credence attributes are mitigated by expertise level, others view credence attributes as being unmitigatable. The goal of a museum is to offer educational value to these goods. Therefore, the research will view credence attributes as being mitigable in offering visitors the necessary cultural knowledge because otherwise the museum cannot educate visitors on their product.

Information economics explains that cultural goods have a mix of these attributes which is also reflected in the museum experience good (Alba &al., 1997). The mix of attributes is reflected in the data available on cultural consumption (EU 2013) shows that roughly a third of European adults visit museums (37%) instead will "search for information on cultural products or events" (cited in Fischer & Mantoan, 2020, p.231). This data shows a lack of hedonic consumption and more an inclination towards searching. Therefore, the museum will compensate for consumer's inability to acquire utility from the credence attributes by including experience and search attributes in the museum's experience.

All these attributes alleviate the consumer's lack of knowledge of the quality of a museum experience. Signaling theory suggests that a signaller has information about the quality of the product which is not publicly known or that the consumer does not know. This makes the signal of equal importance (Spence, 1973). Although the product can offer an abundance of information, some information might already be known which drowns out new signals. Kirmani and Rao (2000) suggest that regardless if the signal is interpreted as positive or negative information by the receiver, the signal is useful. In the world of advertising for the museum experience, and in the context of this thesis, these signals are online. Thus, e-commerce scholars generally agree that effective signaling will reduce information asymmetry and promote consumer trust (Li & al., 2009). In doing so, the consumer is more likely to buy the product. In the case of a museum, buying a ticket.

This makes the signal in itself significant, but of different value to different receivers. In the online market, different signals have different effects on the sales performance. For instance, the work of Akdeniz & al. (2013) showed that warranty had the largest effect on sales performance and web site quality had the lowest impact. Studies conducted by Gomulya and Mishina (2016) showed how a firm can send an announcement to many receivers but the impact of the signal will be determined by the perception of the quality of the sender. This study may have important repercussions when discussing credence goods. Karla and Li (2008) develop a model to examine how firms strategically specialize in certain attributes of a product as a signal of their quality. The authors analyze how this specialization strategy affects consumer buying behavior. The paper highlights how a firm signals quality in a competitive market. These studies show that signals vary in effectiveness across different markets and contexts.

As the previous section explained, museums are apart of the market of credence good which makes them a difficult good to gain utility from. Therefore, the use of technology can help in providing the necessary information which offers utility to other potential visitors which are not a part of their core target audience. The thesis looks into how museums use technology to do so.

2.5. Connectivity and Interactivity

The thesis aims to understand the antecedents of the relationship between connectivity and interactivity mechanisms ability to innovate in audience diversification. The section will detail the two mechanisms to understand the antecedents. First, the section looks into connectivity. The feature of connectivity increases the scale of the museum experience by adding a pre and post museum experience. All of these experiences mutually benefit each other. In using different communication models, museum experts creates experience goods. Although a good in its own right, this information signals the quality of the main museum experience by being a part of it. Therefore, the pre-and-post museum experience lower information asymmetry to innovate in audience diversification. Then, the thesis delves into interactivity. Interactivity is a mechanisms which creates multiple experience and search goods. By providing a variety of different goods which are a part of the museum, museum experts ensure that visitors gain utility from the museum experience. In tandem to this strategy, participatory strategies with experts ensure that visitors gain confidence in being apart of a museum experience. By doing so, museum experts lower the credence attributes. The section delves deeper into these strategies.

2.5.1 Connectivity

In detailing these ICT features and operationalising them, a better understanding is obtained in the aspects of ICT features which increase or decrease audience diversification.

The drivers of connectivity are found in technology as social media platforms benefiting the museum and users alike. These platforms extend the museum's scope and scale of its experience in order to innovate in audience diversification. In utilizing connectivity features, museums create new experiences, extend the previous one and enhance familiar ones in unprecedented ways(Tallon, 2008). Social media offers a dialogic, well targeted, information to the audience members. Moreover, the museum experience is expanded in an attractive and aesthetic way and reaches global visibility(Arends et al., 2009). Fletcher and Lee(2012) have noted the cost-effective way in which social media enables museums to reach a global audience. These connectivity features benefit the museum's users as well. While most traffic to the museum website or platforms is associated with planning a visit to the museum, viewing the museum's online resources is considered as a substitute to the museum experience (Marty, 2007). The user's motivation in using these social media platforms is associated with the perceived usefulness of being able to obtain an additional museum experience and the perceived ease of use, where the latter holds to be a strong determinant (Van der Heijden, 2004). With the adoption of these social

media platforms, museums experience a broadening of their audience base in a cheap cost-effective way by the multiple opportunities afforded by the embedded connectivity feature.

These new communication models provide opportunities for museums.The museum experience is different because social platforms offer new communication models:

- Users can communicate between them: user-to-user
    - E.g. These communication models usually happen under an Instagram or Facebook post. This mode of communication will be comments of appreciation or lack of appreciation about the topic of the post.
- User can communicate between them: user-to-many
    - E.g. This form of communication comes in the form of influencers speaking to their network. This content is cheaper to use as a communication platform than traditional advertisements since it is audience-targeted and targets a community of users. Additionally, influencers build a relationship with their followers to achieve trust and confidence of those who follow them(Trombin & Veglianti, 2020). The built trust formation becomes a trustmark, symbols of reliability (Aiken & al., 2004). In other words, their endorsement becomes a signal.
- Users can communicate the platform owners: user-to museum
    - All comments can be “liked” or replied to by the museum or other users. Another aspect they share is enabling the museum to share videos or photos of the museum experience. This enables them to communicate about the museum in a pictorial form. The users or museum can “like” any picture or video by pressing a thumbs-up picture. These platforms also hold features. Users or the museum expert can post “stories” on Instagram or Facebook which are photos that last a few hours and are found on top of the platform’s page (Image 1). These stories can be automatically shared on both platforms. In these “stories”, a user can tag the museum and the museum can share their story. These stories communicate in pictorial form the experience of the user in relation to the museum.

These models of communication enable the visitor to participate in the cultural interpretation of works of art present in exhibitions and maintain a cultural dialogue with the audience members in real-time(Russo & al, 2006). Additionally, museum members are provided with new types of interaction with the objects and museum knowledge outside of the museum walls. For instance through 3D museum’s representation of the museum, artifacts, videos, e-database and digital museum collections (Marty, 2008). In these manners, social media boost dialogue and real-time communication, in other words “engagement”, to

facilitate the interpretation of the museum experience. By facilitating the museum experience, museum members feel more included and gain more satisfaction which promotes their return to the museum or online museum experience.

Museum experts are worried that social media ability to involve the audience's voice would impact the authenticity of museum knowledge. However, audiences' voices are now viewed as adding to the purity of the museum knowledge (Russo & al, 2006). Despite a change in philosophy, many museums lack financial resources to adequately communicate with the audience's voices. Without this mediation, the audience's voices could be badly utilized. Regardless, these communication models have expanded the relation between the museum and their audience members which is in part due to the museum experience being extended.

Drotner and Parry (Anderson, 2018) view the reconceptualization of the museum's experience as a result of the new technical development of the internet. With the internet, museums and their visitors around the world become interconnected. Now, the museum visitor was no longer the visitor inside the museum walls but the one which followed their website or followed them on social media and interacted with them (Anderson, 2018; Lord, 1999). The museum audience is now understood through a matrix of perspective, being the visitor online, on-site or visiting remotely. These technological developments aided the museum economically and reached new customers because they had multiple avenues to interact with the museum (Anderson, 2018). Inherent to these technological developments is the feature of connectivity, therefore, playing a part in the reconceptualisation of the museum experience.

The connectivity features extended the museum experience into a post and pre museum visit (Kuflik & al., 2015). More than ever, museums have access to a diversity of technologies which create new experiences, extend the previous one and enhance familiar ones in unprecedented ways(Camarero & Garrido, 2012; Tallon, 2008). These changes extend the main museum experience. Either the extension is prior to the museum experience or post the museum experience. The extension of the museum experience is in part helping museums to strategize and shape the information on the experiences prior to purchasing known as pre-purchase information (Nelson, 1970). In taking advantage of signals in the shaping of the pre-purchase information, museums can cater their product to the target audience. This is especially crucial for diverse reasons.

Consumers are more and more online which has put museums in competition with a multitude of other products. Museums utilize connectivity features and have published their collections and experience online. In positioning their collections online, they have a higher chance of reaching their potential audience members. Moreover, as Sundbo(2009) explains, the technology in itself contributes to the museum's experience production , that results in the visitor experiencing an enhanced museum experience through immersive or multi-sensory mediums (Tomius, 2014). Thus, the museum experience

was no longer a singular experience , by providing many of them, every audience member could connect and interpret in their ways (Prior, 2006). Therefore, museum experts can now take advantage of new signals brought by their use of the internet to reach a diversity of audience members. The thesis will specifically look into how museum experts have taken advantage of these signals as a result of their adoption of connectivity features to satisfy users which were outside its core audience.

2.5.1 Interactivity

The drivers of interactivity are found in interactive exhibits and have the goal to improve the museum-going experience of visitors. Formerly, museum exhibitions tend to comprise the actual object with limited explanation. This presentation distances the visitor from the artifact because they are unable to fully comprehend and gain a thorough educational experience as a result of it (Van Dijk & al., 2012). These interactive exhibits are handheld devices, touch tables, 3D experiences, augmented reality or more have blended the traditional visitation style with opportunities to extend their visit. These devices are viewed as engaging the museum-goer more deeply and broadly in museum exhibits since they are able to retrieve the information for reference and approach additional resources(Klopfer, & al. 2005; Van Dijk & al., 2012). This section will flesh out how interactivity affects the museum experience in order to point out in what ways the driver may increase or decrease audience diversification.

The driver of interactivity impacts audience diversification due to their participatory aspects. These participatory aspects are usually defined by museums as being “hands on" (Witcomb, 2006, p.354). This hands-on approach is achieved by technological developments with drivers of interactivity. They are usually a technological medium which is/are added to the main display and that the visitor can operate through physical activity (Witcomb, 2006, p.354; Jung & al., 2019, p.272). In being added to the main display, these interactive characteristics usually add to the educational outcomes of the main exhibition. These interactive characteristics include new approaches to learning by different audiences and for different purposes (Hawkey, 2003). Therefore, the goal of these interactive exhibitions is to attract different visitors with different levels of knowledge and interest on the topic of the artifacts.

This participatory aspect of interactive exhibition diversifies the audiences by shaping the museum experience. By focusing on the educational experience by implementing interactive displays, older models of communication based on the transmission of one authoritative narrative to a passive receiver became superseded by one which acknowledged “active visitor” (Tomiuc, 2014). An active visitor is one who self-educates themselves instead of a passive consumer of knowledge (Macdonald, 2010, p.91). In being an active learner, visitors are viewed as “empowered” (Barry & Doherty, 2016) since they are able to interact with a touch screen and select from a set of options. The different options offered by these interactive displays enabled the museum to market a diversity of narratives to satisfy an audience which

was increasingly diverse and interconnected (Burton and Scott, 2003). In proceeding with this shift, museums were effectively reconstructing their relationship with their audiences, "encouraging new connections, meaning-making and learning" (Tomius, 2014, p.35). By focusing on creating an "active learner", interactive displays individualize learning in order to satisfy visitors and increase the chance they revisit. However, critics view interactive exhibitions as creating an illusion of choice since they need to select from a predetermined set of options (Macdonald, 2010). This is a legitimate criticism but an illusion does not deter the initial goal to diversify an audience base.

The driver's interactivity encompasses the ability to personalize the museum experience. Recent advances in new technology have enabled users to obtain a computer-based system that can assist museum visitors in selecting the content which interests them, Enabling the visitors to personalize the museum's visit. This computer-based system inherently expands the supply and variety of goods. For instance, audiences can explicitly enter information about themselves and their interest (Witschey Al, 2006), obtain personalized recommendations (Stock & al., 2007) and/or stimulate interactions with other museum visitors (Wakkary & al., 2007). Through new technology, museums no longer communicate information in a one-size-fits all paradigm which traditionally benefits some parties but not other. Instead, communication is modified based on the audience's active participation and interaction with the museum's new technology (Kotler & Kotler, 2000; Wakkary & al., 2007). This shift creates a more inclusive museum experience that caters to diverse interest while making the museum exhibit more accessible.

The system which enables museum visitors to personalize their experience is formed by museum curators or in tandem with third party companies. If these systems are built by curators, their goals will be to foster visitor's learning (Falk 1999), generate entertainment (Marshall et al. 2016) or extend the visitor's experience beyond the museum walls (Lanir et al., 2013). The curators create a good (the museum experience) which supports a do-it-yourself approach. This do-it-yourself approach has a tendency to personalize the learning environment, hence, the content of the new technology (Not & Petrelli, 2019). The third-party who puts in place the personalisation features democratizes the access to a customized learning environment. The personalized features listed underneath are developed and paraphrased from Not and Petrelli (2019) research. They are discussed to inform the reader are characterized in being:

(1) easy to deploy, which means any user can use the new technology offered by the museum

(2) the new technology can be used outside or/and inside the museum

(3) a screen-based interaction which is understood by all visitors

The personalisation ICT features created by the curator and developers enable the museum to cater to multiple different user preferences to satisfy their utility, or visitor type (disabled, families, individual and

more)(Le Berry Al., 2013). However, utilizing technology with personalisation characteristics create significant sunk costs for a creative industry already facing an economic downturn. Despite the high sunk cost, the marginal cost of reusing and creating a new personalized museum experience is zero and the fixed cost is also relatively zero. The museum only needs to rely on a specialist every few years to reformat the technology. Despite the benefit in utilizing new technology which serves various visitors at the same time, museums' ability to develop personalized museum experience with inherently mixed and diverse audiences in mind remain difficult (Anderson, 2018).

3) Methodology

In order to answer the research question through the lens of the previous concepts discussed in Chapter Two, a qualitative case study research was conducted with ten different museum experts in museums which spanned across three European countries (Belgium, France and Austria) through semi-structured interviews. All ten museum professionals work in museums who use digital technology such as interactive exhibits, museum apps, and social media to improve the museum experience. All of these experts used new technology with either interactive or connectivity characteristics. The museum experts were chosen on the fact that they worked directly with new technology and in a museum. The museum, which used these digital technologies, is construed as a museum because it is a bearer of knowledge and abides by the ICOM definition which is made by the International Council of Museums (Sandahl, 2009). The aim of the paper is to use a qualitative research through semi-structured interviews of these experts to obtain the antecedents of the relationship between ICT features of interactivity and connectivity that increase audience diversification which was found by Bakhshi & Throsby(2012).

The approach of this research was qualitative research through semi-structured interviews, as it attempted to investigate how museum professionals can increase audience diversification through two characteristics, interactivity and connectivity, by using diverse digital innovations. The impact of technology and its ability to diversify audiences is well known and studied, also in the case of museums (Bakhshi & Throsby, 2012; Burton & Scott, 2003, Oleson, 2016; Camarero & Garrido, 2012; Camarero & al., 2015). However, these research papers do not offer an in-depth observation to the phenomena, open the black box which is the museum, nor offer insights into factors which cannot be quantified. This research offers this missing perspective and offers a more complex understanding of the relationship between technology and audience diversification. The method of semi-structured interviews was chosen in the qualitative research due to its ability to provide the museum expert's views on the phenomena and

the semi-structured aspect of the interview enables the research to gain access to insights which are not offered by preconceived theories (Gill & al., 2008). Previous research papers (Johnson & Thomas, 1998; Macdonald, 2006) offer insights as to technology's influence on the museum experience but view the museum as a firm and does not gain an inside look. This paper obtains the museum expert's experiences in implementing these technologies, examine the different technologies in terms of their ICT feature and their use in practice. By obtaining these insights, the research shed light onto how certain uses of these technology can be more advantageous then others, as well as, deter certain types of audiences. Finally a thematic analysis of the interviews occurred to gain a set of common themes, topics and ideas (Braun & Clarke, 2017) which give insight to the antecedents of the relationship between ICT features and audience diversification. These patterns would become the baseline to create suggestions for future museum experts when they are using technology in a museum context.

The research is especially relevant for museums after COVID-19, the global pandemic. Due to the restrictions placed on museums, museums were not allowed to host and, thus, used new technology. The Network of European Museum Organisations(NEMO) published a study with more than 200 museums from 39 countries that ran from December 2020 to May 2021. They found that twenty-three percent of the respondents managed to design and launch new formats and digital tools for digital revenue in order to cope with the pandemic. When these respondents were asked about their reasons for launching digital innovation, the top answers were audience-related. In increasing their audience base, the museum is able to make themselves relevant and increase revenue (NEMO, 2021). The current place of new technology in the museum context is extremely relevant. A qualitative study will shed light on the current new technology in museums and how they have been put into practice in order to ensure that technology's advantages can really be used. Specifically, the research will answer: how do museum experts use digital innovation to increase audience diversification through the two mechanisms of interactivity and connectivity?

3.1) conceptual analysis

Prior to the interviews a conceptual analysis occurred. Bakhshi and Throsby(2009) conceptual analysis was utilized for the research. According to Bakhshi and Throsby(2009) research, the features of digital technology (interactivity, connectivity and convergence) increase audience reach. Due to the research focusing on audience diversification, Bakhshi and Throsby(2009) conceptual analysis was chosen as the basis of the study. Although they used three features, only two features of their study were chosen. The feature of convergence was not considered. The feature of convergence is not included

because the feature is inherently included in the connectivity experience mediated by the digital features. The prior point is labeled as “on-site” or “off-site” (see Appendix D). Only the technology with features of interactivity did not have the convergence features inherent to them. Initially, the feature of personalisation was chosen but was quickly not considered due since it is an embedded feature inside the interactivity and connectivity features. As detailed in the table, the interactivity and connectivity characteristics have personalisation embedded in the museum experience either through creating their own meaning, participating in the museum experience or picking-and-choosing the information they wish to learn. In the end, only the feature of interactivity and connectivity was chosen to analyze how technology increases or decreases audience diversification in a museum context.

As Sigala (2005) stated, central to these features is a shift from focus away from being product-centric towards experience-centric innovation. Each feature creates an experience or can be combined to open up a new museum experience mediated by digital technology which inevitably helps the museum work on audience diversification. Once the features were chosen and defined, a digital innovation that utilizes the feature was chosen as the central subject of the thesis and the digital mediated museum experience was analyzed (See appendix D).

3.1.1) Operationalisation of the features in relation to the new technology

The prior section gives an overview of the general three technologies that are studied and in what way they diversify the audiences in their precise museum context. This section will delve more thoroughly into each technology and as to why they encapsulate the connectivity or interactivity feature.

Ten different interviewees were chosen that worked with ten different technologies (see Appendix B.1). The new technology which was studied held either the connectivity or interactivity feature. Six interviews were done on the connectivity feature and seven interviews were done on the interactive feature. Some of the interviews were done on both features due to them working with both features. In obtaining an equal amount of data for each of

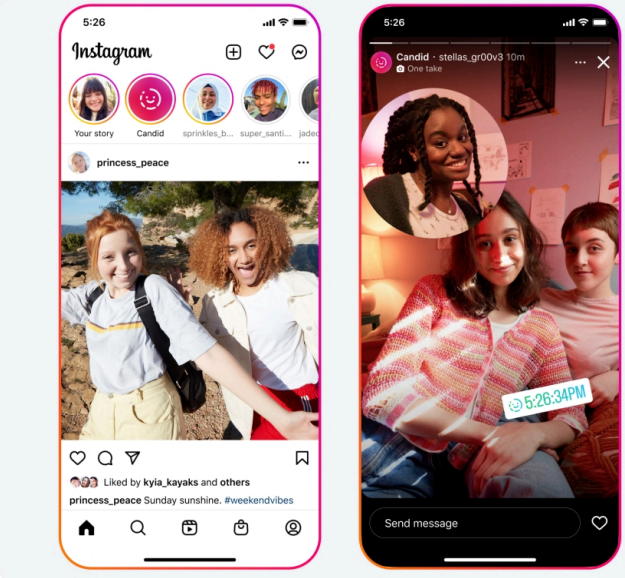

Image 1: Visual portrayal of an Instagram Account

The image portrays the Instagram app that is open on a user's screen.

Centre of instagram screen: The user sees photos that are posted by a user they follow.
Bottom of image: we see the heart, comment and flying paper plane. All these icons permit a user to share an impression of their feelings towards the picture. Underneath the photo, users can also comment in words.

Top of instagram screen: The circle icons on top of the screen are "stories". The instagram screen image to the right shows a "story".

these features, a general picture can be obtained into how they increase audience diversification.

3.1.1.1) connectivity

Social media platforms as Instagram, Facebook and Youtube were analyzed as having connectivity features. These platforms fall under the connectivity features since they abide by Bakhshi & Throsby's definition. The authors define:

> "the capacity of the internet to enable direct and high-frequency communication between and amongst providers and users of cultural services, for example cultural institutions creating online resources to enhance the experience of audiences for 'live' artforms, or social networking sites like Facebook or Twitter which enable consumers and audiences to share their critical reactions with both arts organizations and each other (Arts Council, 2009c cited in Bakhshi & Throsby, 2019)" (image 1)

3.1.1.2) Interactivity

Interactive exhibits or programs are considered as having interactive characteristics. The interactive programs fall under the interactivity features since they abide by Bakhshi & Throsby's definition. The authors define:

> The potential to provide for two-way communication between the provider (such as a museum or gallery) and the audience, for example through arts-organization websites that allow users to mix their own music content or to produce their own artwork online (Hughes and Lang, 2006; Knell, 2006 cited in Bakhshi & Throsby, 2009)

Image 2: how to use the Artivive app. You point to an image and choose to receive some information on the painting.

(Artivive.com)

The program Generation Next! (Bozar, 2024), Art & Public's video game program, 3D exhibits from the Horta Museum(urban.brussels, 2023), Artivive app (artivive, 2024) and user-generated online database (Rijksdata, 2024) fall under the connectivity feature. All of these programs provide two-way communication between the provider and the audience. For example, in Generation Next! Program, the young generation is invited to create their own

photography using a self-made camera in a museum context. Similarly, Art&Public worked with Art & Marges to create video games for their museum exhibition. All of these programs offer an opportunity for museum audiences with the help of museum experts to create their own artwork.

Some interactive programs such as The Musee Horta and Artivive allow for the user to personalize their learning experience inside the museum. In other words, these programs, such as the 3D visit of the Museum Horta or the Artivive app, allow the participants to pick-and-choose (Image 2) how they learn and create their own museum experience. For instance, in the example of Artivive, the visitor is able to walk around the museum, point their phone to the painting of choice and add to the initial learning experience offered by the museum. Museum members can now customize their museum's learning experience, unlike the other programs that allow them to personalize their own artifacts.

3.1.2) Operationalisation of a Museum

The interviewed museum experts work for museums which abide by the ICOM definition(ICOM.museum, 2022). Therefore, a conceptualisation of what is a museum is important to gain clarity of the environment in which the technology is studied.

Museums are a heterogenous group due to their different collection and specialization. Therefore, it is important to further clarify what a museum is. Various scholars have attempted to categorize museums according to their characteristics (Frey and Meier, 2006). In general, there are five main types of museums which the European Group on Museum Statistics (EGMUS) has identified as: Art, Archaeology and History Museums; Science, Technology and Ethnology Museums; and Other Museums. These Museums display different artifacts. Inevitably, museums attract different audiences who resonate with the museum’s display and aims. The interviewed museum experts work in a museum which abides by the ICOM definition and a part of any museum category. Clarifying the environment in which museum experts work and the specialty of their museums can shed light on potential contingencies and how the implementation of technology is affected by the context.

Museum expert that worked for third-parties were also interviewed. A third-party is defined as a company that collaborates with a museum. These companies were interviewed because museums do not have the resources to work with new technology and, therefore, rely on third parties. Therefore, by interviewing different museum experts in ten different museums, a general picture can be created. If the study were to interview everyone in a singular museum, the research would have been thorough and in-depth by gaining

a general picture in how a singular museum worked on audience diversification. However, in interviewing ten different interviewees from ten different museums, a general picture of the research can be understood which encompasses multiple different environments and contexts.

· 3.2) Semi-structured interview

Generally, the semi-structured interview was chosen due to the various ways in which it offers flexibility in the interviewee's answers. Flexibility is essential in the research due to new technology being a very relevant topic as a result of the pandemic and museum's need to diversify their audience. Due to the relevance of the topic at hand, semi-structured interviews offer the interview to enter topics which prior research might not have taken into account. A structured format my hinder the depth and richness of the interviewee's responses (Bryman, 2008)

The interview is a combination of two types of questions which are pre-planned prior to the interview: open-ended and closed-ended questions. Due to the qualitative nature of the research, the interview consisted mostly of open-ended questions. Open-ended questions offer an opportunity for the interviewee to successfully offer interviewees the space for more free-form answers where their answers can be broad and in detail which make it easier to express subjective topics (Creswell, 2009, p. 8). In asking a variety of open questions, the two features can be investigated through the theoretical framework and fully and thoroughly grounded in theory. Generally, in asking multiple types of questions, the interviewee is offered space to reconstruct perspective of past experiences and opinions, the interviewee can explore the meaning of the two key terms, interactivity and connectivity and the rules governing them. The flexibility offered by open-ended questions gives way to potential conversational tangents which close-ended questions typical of a structured interview might dismiss (Bryman, 2016). The open-ended nature of questions offer short answers and lengthy narratives due to semi-structured interviews imitating free-form conversation (Weller & al., 2018). These forms of responses ensure that all themes and topics which might not have been taken into account in the interview guide are discussed. Moreover, by the open-ended questions focusing on specific characteristics (interactivity and connectivity) that contribute to diversification and the complexities brought on by putting them into a museum context, the research generates more actionable insights for museum professionals that are specific to their circumstance.

Due to the semi-structured and qualitative nature of the interview, different open-ended questions were asked at different stages as identified by Charmez(2002) cited in Bryman(2016, p.479). Due to the conversational nature of the interview, some questions overlapped in practice. These questions were split in three different types of open-ended questions:

1) There was the initial open-ended questions:

- How do you define interactivity?
- What limitations are there in interactive exhibitions?
- What have been the obstacles and challenges in implementing digital technology to diversify the audience?

2) Then, there are intermediate questions which started by “why”, “how” or “did”

- How does your museum identify and understand the needs and interests of different demographic groups when planning its audience diversification efforts?
- Can you tell me about them?
- Why do you address this target group?
- Did the target group's expectations of the museum experience change before and after the experience?
- What have been the obstacles and challenges in implementing digital technology to diversify the audience?

3) Finally, there is ending questions, which consisted of advice

How can museums improve…

What do you define as success…

In addition to open-ended questions, the interview had close-ended questions. The start of the interview always had close-ended questions which offered the background information of the interviewees. The close-ended questions were:

General information

1. Could you tell me about what you do at the museum
    a. Name
    b. The museum name
    c. Do you know how many people visit the museum
    d. Do you know how many people have participated in your project
    e. Can you tell me about the general public that you work with?

f. What is the mission of the museums?

Questions about audience diversification

1. Is your museum working on attracting different audiences?
    a. Are there any outreach programs or initiatives aimed at specific demographic groups to increase their representation in the museum's audience?

Close-ended questions are necessary for questions that offer a narrow focus and where no additional context is necessary (Creswell, 2009).

If topics which were not pre-planned, the interviewer is able to ask probe questions to delve deeper into the topic (Robinson, 2023). The probe questions were inspired by keywords of topics brought up by the interviewee which were also discussed by other interviewees and topics which were not previously planned. In asking these probe questions, the interviewer would be able to compare and contrast topics which were not pre-planned. For instance, the role of third-parties in a museum function was not taken into account in the initial planning of the interview. In obtaining this topic, a clearer perspective on long-term initiatives in audience diversification was understood. Other probe questions were asked when the interviewer's goal was to gain a deeper insight into the example. This incited autobiographical memory which brought in honest opinions of their projects, undeterred by the formal nature of an interview. For instance, in asking about the Musee Horta's social media plans, the curator honestly told me that their lack of financial resources made them lax on publishing with Instagram and Facebook. Additionally, they honestly spoke of their lack of digital literacy. Although these topics might not help the analysis in question, the additional information gives context to the topic at hand. Therefore, probing questions were important to unveil potential hidden unplanned topics and insights (Robinson, 2023).

The interview process happened online, between May 2023 and the month of April 2024 for a minimum of 45 min on the platform of their choice such as zoom, google meets, or teams. The meetings were done online which provided the advantage of contacting people in other countries and having more flexibility in timing because no traveling is necessary. A few disadvantages that occurred were technical difficulties from a lack of storage on my personal devices. Additionally, the lack of sharing the common space potentially created some missed opportunities to respond to body language and bodily cues (Gray & al. 2020). Before the interview, first, a brief description of the research is sent via email which they share with me after the initial contact. The email explains why the interviewees were chosen. In doing so, the interviewee understands for themselves what knowledge they have which may help me in my research and how they can help me. Most importantly, the e-mail also has a brief definition of the main characteristics (interactivity and connectivity). By providing a brief description of the main characteristics

enables us to stop any misunderstanding regarding what they mean and for everyone to be on the same page. After the email is sent and the interviewee confirms with me they understand everything.

The second step is the interview. These questions were split into five different parts for various reasons: background information, museum and its adoption of technology, interactivity and connectivity were the core parts of the interview. Each interview was organized in the same way and recorded accurately to increase reliability(Bryman, 2016) and easily compare and contrast the answers of the interviewees. Part 1 and 2 (background information & museum and its adoption of technology), create a baseline for the interviewee and the museum respectively. The three last parts give the core data of the study. Through the sections, the research gains a thorough understanding into how these characteristics produce innovation which increase audience diversification. Apart from the background information of the interviewees, each section holds questions which are designed in connection to the literature review. Appendix E synthesizes from which concept these questions were operationalized.

· 3.3) Sampling for interview

The targeted sample of this research was four types of museum experts who worked with new technology inside a museum. They were museum experts in marketing, communication, public engagement, curators and third-parties. To choose these museum experts, they abided by various criterions. Generally, the museum works for a museum that specializes on any collection and works directly with new technology.

All museum experts work with a museum. Their museum abides by the ICOM definition (Sandahl, 2019) and is inscribed in one of the museum categories (see appendix C). Third-party museum experts were chosen as well. They are labeled as third-party museum experts because they have a company which works in collaboration with a museum that abides by the ICOM definition. Their presence in the sampling is crucial since some museums work with third-parties to increase audience diversification, especially when they seek to add an interactive exhibit into their space.

These museum experts are in the marketing, communication, public engagement field, curators and third-parties who work with museums. All of these experts work directly with new technology to increase the museum audience reach and the diversity of their audience members. They all use new technology to improve visitor experience and their understanding of the museum experience in order to increase the museum's attractiveness(Kawashima, 1998). Most of these interviewees worked in tandem with each other. For instance, the Art & Marges communication manager worked with the Art & Marges public engagement manager.. Another example is the marketing manager of Bozar who works in tandem

with the Public Engagement manager. Two third-party entities were chosen, Art & Public and Artivive. In doing so, these third-party interviews offer a perspective in how museums are diversifying their audience base outside the constraints of a museum context. Certain experts intersected with multiple museum expertise. For instance, the curator of the Musee Horta, ProjectSpace and the public engagement manager of the Arc the Triomphe did social media in addition to their job. In these cases, I did not push to obtain other members which work with them since they utilized the interactivity and connectivity feature. In interviewing interviewees who focus in different fields and in tandem with each other, a greater picture is observed in how museums increase and diversify their audience reach. The following table (see appendix C) details the different museum experts and the technology they use. The tables show that these museum experts were from two different countries: Belgium and Austria. In obtaining museum experts from two different countries with different cultural context, it provides data which will be more easily transferable to other countries.

3.3.1) The sampling frame

The criteria of the sampling frame is explained through the various steps taken here forth. First, digital innovations which held one of the main features (interactivity and connectivity) were chosen. The three main digital innovations were smartphones, interactive exhibits and social media. They were chosen based on the Bakhshi and Throsby(2009) conceptual framework. For example, Bakhshi and Throsby(2009) exemplified social media as having features of connectivity since they enable high-frequency communication between visitors of the museum. In terms of the feature interactivity, the experience of an interactive exhibition was chosen as the digital innovation since the user's interaction with the museum's exhibition leads to a creative output in these circumstances which is in line with the definition of interactivity. Interviewees, who worked with apps on smartphones and with video games were also chosen due to its interactive characteristics and their role in museums. These interviewees were, however, third-parties since museum did not have money to do these interactive exhibition in house. Second, I obtained a sampling size from stratified and snowball sampling. Through these techniques, I obtained interviewees from different sectors and that worked with technology that held interactivity and connectivity characteristics. These other museum experts were chosen since their perspective complements the public engagement expert. All these museum experts contribute to building an experience for the consumer. In the end, the sample ended up with 10 participants (n=10).

3.3.2) Sampling technique

For the study, a combination of probability and non-probability sampling methods were used: stratified sampling and snowball sampling. In having a combination of both samples, the research was able to obtain the desired sample.

3.3.2.1) Stratified sampling

First, a stratified sampling was done by going on the ICOM Linkedin page. In going on the ICOM linkedin page, I obtained a population of museum experts. Through the museum expert's page, I obtained descriptions of the experts' work which provided me with relevant information necessary to create homogenous groups on similar characteristics. Having read about the expert's work, all social media experts and interactive exhibit experts were categorized. However, no interns were interviewed due to their lack of experience in the position. When I created two homogenous groups (connectivity and interactivity group), I verified that the interview still worked at the museum, worked in a museum where I could communicate in my own language, and double checked if the technology they used fit in the interactivity or connectivity definition which was previously operationalised. If this was the case, I contacted them on LinkedIn or their social media platform by sending them a message.

In terms of contacting interviewees on Linkedin, several steps occurred. Due to the limited characters of the initial message sent on Linkedin, a second message was sent with a clearer account of the research. LinkedIn was chosen as a platform of contact because it offers direct access with the employee and permits me to bypass the secretary. Several factors led me to choose the various interviewees. First, they worked for a European or American museum which fell under the definition and characteristics prescribed by ICOM(American Alliance of Museums, 2023) (found in Appendix C). In terms of interviewees who were further suggested to me by the interviewees on Linkedin, I contacted them via email. I was CCed by the initial Linkedin interviewee and referred which enabled an easy communication.

I had multiple starting points. While contacting individuals online, I contacted my own network in order to gain access to museum experts. The direct connection permitted them to respond faster to me. These starting points were chosen so that I could ensure the highest chance of gaining access to interviewees who worked with the features (interactivity and connectivity) needed to be studied. Additionally, in having multiple starting points, the recruitment technique permitted me to quickly nix participants who were not willing to do the interview or who felt they did not satisfy the criterions which I felt they initially had. If the participants did or did not accept the interview, I asked them to connect me with someone else in their network who fit the criterions and were willing to participate in my research. Moreover, multiple starting points take into consideration non-response time (Bryman, 2016) which is

extremely likely and did occur. If there was no-response, as suggested by Bryman (2016) a follow-up message was sent which did help once. In order to not have a sampling bias, I supplemented the sample with case studies which would provide me more or less an equal amount of interviewees who spoke of interactivity and connectivity. With all that, I obtained an equal amount of information on both features.

3.3.2.2) **Snowball sampling**

If the interview did occur, a snowball sampling was done. A snowball sampling was used which is "when the researcher accesses informants through contact information that is provided by other informants" (Noy, 2008, p.330). Therefore, once the interview was done, I asked the interviewee to provide me with colleagues which they felt could add to what they had said or contribute another perspective. As Noy(2008) argues, this sampling technique is effective for obtaining information for less accessible populations. This is applicable to museum professionals as museum professionals are extremely well connected to other museums. This makes their network extremely dynamic and fluid, but it makes it extremely difficult for an outsider to enter and get into contact with a professional. Additionally, this form of sample extends the geographical scope which can be very interesting for the study as museums spanning across Europe can make for a more thorough and representative study on museums and digital innovation. This advantage is especially facilitated by the virtual networks which are brought about by social media platforms (Baltar & Brunet, 2012). Moreover, the method is cost-effective because it means that as a researcher you spend less time finding a data population.

While snowball sampling is appropriate for the foundation of this study and is commonly employed in qualitative research, there are some disadvantages associated with them. Since the participants from the sample refer me to other participants, a sample bias can occur. Participants are likely to point you towards people who resemble them or have similar opinions and values as them which make the sample non-random. Although this sampling tactic could create some bias, the research does not seek to obtain opinions but rather how technology increases or decreases audience diversification in a museum context. Therefore, in gaining access to the interviewees colleagues, a richer image can be created in how technology impacts audience diversification. However, it remains that contrary to a probability sample, there is a lack of definite knowledge as to the accurate representation of the target population (Parker&al, 2019). A future study should be done which takes into account these limitations.

Saturation occurred in various ways. First, a minimum of ten interviews were done of museum experts (N=10), and all features were analyzed. Despite the greater the sample size, the greater precision, the research can only be done within a certain limit of time. Additionally, certain interviews were obtained from my own network were not included because the expert did not work for a museum which is accepted under the ICOM definition. In this case, the expert worked for a chateau. The other interview

which was not included worked in a fashion museum. I could not get the communication department and, therefore, spoke to the curator. In this case, the curator did not know enough about communication to offer me interesting insights and instead discussed projects which were unrelated to their use of new technology. Moreover, the point of saturation was chosen if new data no longer suggest new insights (Bryman, 2016). This was difficulty to obtain since gaining access to more museum experts is a huge obstacle in obtaining enough interviews to reach full saturation.

3.4) Data analysis

All audio-recorded interviews were transcribed, and observations annotated and coded. To do this, the transcribed audio-recorded interviews were uploaded to Atlas.ti. Atlas.ti is utilized to do a thematic analysis (TA) which is to systematically identify, organize and offer new insights into patterns for meaning(theses) across a data set which is perfect for qualitative research(Braun & Clarke, 2017). In utilizing the method, the research will find a common way of thinking about the two features of interactivity and connectivity. The analysis occurred in six different steps: familiarizing yourself with the data, generating initial codes, searching for themes, reviewing potential themes, defining, and naming themes, and finally producing the report. More precisely:

1. Familiarize with the data: I read the interviews and understand the overall ideas. I correct any spelling mistakes or misunderstandings which I might have not initially caught when I transcribed the data.
2. Analyze the data: Anything which caught my eye was coded. These codes centered around the topic which were central to my thesis such as audiences, technology and museums. Other codes were also created and these centered around intermediaries, expertise, community and preservation. These codes were created as they seem relevant to the interviewee and discussed thoroughly. Codes as community were also discussed by a few interviewees from Art & Marges and Bozar. In seeing their relevance for both interviewees, they were considered as an important open code. This process occurred over a period of weeks until all relevant data to the research question was coded. This created over 700 codes.
3. Axial coding:. After open coding all interviews, I started axial coding. Axial coding was done on accounts that I compared and contrasted information. This process was done various times over the course of the research.

A few axial codes did not enter the next phase of the analysis. Image 3 is an example of an axial coding that remained an axial coding and was not added to selective codes. Some axial codings were

revised through the process. For example, I revised my axial coding of “intermediary”. Intermediary became an open code and placed under “experience attributes”. This was done since intermediaries offer the technology which creates a distinctive experience for the museum audience members. The open codes related to the museum's function were also categorized together but did enter the selective phase of the codes. This was the case because it was not relevant to the research question. Finally, the MoMu interview had a significant amount of codes which did not enter the selective code process because she discussed the standardization of information in museum databases which was a topic not necessary for the research question. Therefore, all the problems around standardizing the name of artifacts and preserving how they are remembered historically were not deemed relevant information to answer the research question.

Image 3: example of axial coding

4. Finally, the main selective codes were created. They were categorized with the literature review in mind. These selective codes were information asymmetry, definitions, museum context, credence, failure to mitigate credence attributes. For instance, information that spoke of experience and search attributes were placed under information asymmetry. Such as their answer to what is a successful museum experience because this defines their concept of a “lemon”.

To successfully have done the analysis is when the research has found sufficient data to convincingly present to the reader an evident pattern. To ensure validity(Bryman, 2016) of the analysis, the analysis will be compared to the literature and see if the data agrees or disagrees with current theory.

3.5) Validity and reliability

To ensure reliability, specific museum experts and types of technologies were chosen. In terms of museum experts, they work for museums which abide by the ICOM definition and who work in Europe were chosen. Third-party entities were also interviewed in this research but they work in collaboration with museums who abide by the ICOM definition. The curator of ProjectSpace does work with China, therefore, certain aspects of China's politics does influence her artists endeavors. However, she is based in Vienna. As discussed, third-party museum experts were interviewed as well. In having multiple types of museum experts which work in different fields but to affect audience diversification, different perspectives are obtained. In having different perspectives, the topic at hand is thoroughly investigated and offers a holistic insight. Thus, triangulation of the data occurs.

To ensure credibility, I will discuss a few interviews. First, I will discuss the MoMu interview. The interview with the museum expert of MoMu in Antwerp was interpreted differently after the interview. The interview was done because I had interpreted a museum database as having connectivity features. However, after the initial first step of the analysis, I came to conclude that the interview did not abide by the connectivity features. She did discuss some projects she had done with the Rijksmuseum. These projects were significantly detailed and spoken about since I recognised in the interview that it satisfied the interactivity feature. Therefore, I had acquired sufficient data to categorize this interview as being a part of the interactivity sample of interviews. Second, I interviewed the Artivive CEO. Due to the limitation of time, I was not able to ask all questions necessary to the social media use of Artivive. If the study were to be replicated, gaining more information would be necessary.

In terms of technology, the technology they used was consistent with the interactivity and connectivity features. An equal amount of data on the interactivity and connectivity feature was taken. A limitation in the sample did occur but was kept to satisfy the prior point. To gain a perfect holistic perspective, the museum with which ARTIVIVE worked should have been studied. I was unable to contact the marketing manager of the Belvedere because he was too occupied. The case study was kept in order to have two phone apps to be studied (Artivive & Arc the Triomphe).

Finally, a theoretical triangulation (Thurmond, 2001) was done to provide validity and credibility to the research. The findings of the research were analyzed in terms of the literature found in chapter two. In doing so, the phenomena which is analysed from the findings are offered more context. A theoretical triangulation also clarified any potential bias by observing if the data challenged or extended the current theoretical research.

4) The impact of New technology in the Museum "Field"

The research interviewed ten different museum experts on how they used new technology to diversify the audience base. The data from the qualitative interviews demonstrated how new technology's dimensions of connectivity and interactivity open up enormous possibilities for museums to extend their reach to new groups of consumers in the current museum "field". The section will detail museum characteristics which impede audience diversification and how each dimension opens up new avenues to innovate in audience diversification regardless of these obstacles.

4.1) Interactivity

Interactive activities provided the museums with ways to increase the museum experience value to a diverse set of audiences by reducing credence attributes.

4.1.1) Interactivity as a solution to credence attributes

New technology with interactive characteristics helped museums innovate in audience diversification by mitigating the museum experience's credence attributes. As most goods, a museum experience has search, experience and credence characteristics at the same time. These characteristics are dependent on the consumer's expertise on the subject as discussed in Klein(1998). This results in certain museum audiences such as the younger generation or marginalized population experience more credence attributes than other audience as discussed in by the marketing manager of Bozar:

> " But at Bozar with the very classical programming, and it being a really old institution with like, kings, loges, and so it has this really, eliterian image. So reaching younger audiences becomes a bit more challenging. So that's why they have someone like me, whose main role is to try and find angles for younger people."

Along the same lines, Ekaterina, who also worked for Bozar expressed that younger generations associated their museum's image to "exclusivity" and therefore, the museum lacked a relationship with this market. From these interviewees, the research reveals that museum experts view museum experience as having high credence characteristic for a younger or more marginalized generation. They view the museum experience as inviting a reference group of individuals which reflect to the younger generation

that they will not gain value from the experience. These individuals represent in themselves an accumulated wealth of knowledge which a younger population have not had time to gain, thus, giving the credence value of the product by their presence. In being a credence good, the younger or more marginalized population have a high cost required to receive assurances of the quality of the good. The cost of verifying quality is key to identifying the utility of a type of good. A credence good has a high cost to receive assurance on its quality (Ekelund & Thornton, 2019). The cost, both money and time, to verify quality is expressed in the following data from interviewees.

First, interviewees discuss the cost of time in terms of expertise. The quality of a museum experience relies on having expertise in the subject or knowledge of the subject. For instance, The manager in charge of audiences at Art & Marges stated "that museums are a ritual thing. It's a very ritual space. If you don't know the ways of a museum, it's hard to push the door, even for a small museum like ours". The CEO of Artivive stated, "Because they don't have the patience to listen to audio guides. And get into, you know, art history. And I'm sure that it's like, everything is at such a fast pace that they need some, you know, some moving images to grab their attention. The older generations that already maybe have a very good base on art history, and they have a different experience with the art that they're looking at". This statement pushes a narrative that one needs to have particular knowledge/expertise before entering a museum space.

Second, the data of the interviews revealed that a museum experience is a credence good because of the high monetary cost of the "product". As a result, museum experts made the museum experience free in some cases. Outside of the scope of the thesis's topic, most interviewees did express that their museums had subsidies from the government to lower the cost of the museum experience for a younger population. This resulted in museums such as the Musee Horta having each first Sunday of the month free. The Musee des Bozar, Art&Public and Art & Marges worked with the museum pass which is a card that offers Belgian residents to enter the museum for free. Therefore, in having free entry, museum experts were able to build the local consumer's confidence in the credence attributes of the museum experience.

These statements point to museum experience having a high cost of time and money which makes them a credence good. From these interviews, there is a general understanding from museum experts that museums' credence attributes are high towards the younger generation. However, they can mitigate credence attributes by providing free entry to their museum. As a result, museum experts are failing to attract a younger generation with technology but successfully do so by opening their doors.

4.1.2) Factors of Interactivity in Credence Mitigation

4.1.2.1) multiple experiences from technology

The museum experience in combination with technology is highly valued by a younger generation and digital enthusiasts in the museum audience. The interviews detailed how technology assisted the younger generation and digital enthusiasts in creating a relationship with the museum experience. In other words, technology helped mediate the museum experience in a way which the members gained value. Thus, the combination between technology and the museum experience offered value to the audience members despite their lack of expertise in museums and ability to access the museum experience's credence attributes. This meant that while there was the main museum experience, the combination between technology and the museum experience created another type of museum experience. The museum is now able to market a diversity of experiences- in economic terms, experience goods- to satisfy the main target group while extending to the younger generation. The experience good mitigated the credence attributes because of certain characteristics they have which will be further detailed.

From the interviews, the data revealed that technology serves as a tool to close a comprehension gap between the audience members and the museum experience's content by fostering a familiar environment which makes the museum experience more digestible. The following interviewee from Art & Marges discuss this:

> Our goal is to use the video game as a tool but not as a means to its end. It is a mediation tool to render the young sensitive to certain topics in the museums. It's also a tool which can motivate the young as it is true… When we speak of video games, it interests them more. It enables them to participate in subjects which are not always easy and that don't interest everyone. Therefore, if the subject is mediated by technology, it motivates…

The technology with interactive mechanisms mediated a museum experience for a younger generation. This experience shaped themes in a more digestible manner for them. In addition to creating a new and more digestible experience, the tool in itself creates a more familiar environment for the younger generation which helps them tackle the museum experience. The use of technology with interactive characteristics mitigate credence attributes by creating an environment where a younger generation can correctly understand a museum experience. The more comprehensive content influences the younger generation's confidence in the museum experience's credence attributes.

The benefits of the technology as a medium is not limited to a younger generation. Vivianna, the public engagement officer at the Arc the Triomphe, spoke about their app which they are currently developing for their audience members. In her eyes, the app would fulfill their mission of cultural mediation. As she expressed:

> Our aim is to have another tool, another device, available for free. So it's another way to discover our monument… we already have all these different devices. And the app will be one of our devices and a part of a strategy. It is going to complete our strategy in order to make the monument more accessible.

The company Artivive held similar thoughts. While not explicitly having created a company with intentions to diversify audiences, the CEO stated, "the times you go to a museum, you do so to have a new experience and different view on this. But you can also go to a museum to learn. And technology gives you an easier entry to this". He used examples of creating a VR experience from the history of a photo exhibited in the Belvedere museum. He said, "So it adds the value that you can go through this technology a little bit deeper into the matter, into the story, into the exhibition itself". The technology enabled audience members to observe information in a new context. In observing the information in a new context, the technological experience which promoted this context increased the visitor's confidence in the museum experience's value. The added perspective to art achieved by the technology played a crucial role in visitors building loyalty. These two interviews revealed that the perspective offered by technology with interactive characteristics created value for all audience members in the museum experience's credence attributes.

While most interviews focused on attracting a younger generation into museums, a few interviews looked into using technology with interactive characteristics for different age groups. Artivive and Vivianna from the Arc de Triomphe delved into how interactive characteristics mitigates credence attributes for different age groups. The CEO of Artivive stated,

> "We were very surprised that older people like 60-70 plus were experiencing it. And were very curious, because these people may already know the collection and the artworks, they have a different relationship with artworks that are there. And in this way, they have a new experience, the things that you already know"

In terms of attracting adolescents, Vivianna stated, "I would like to develop a...uh... like a sound tool for youth and for adolescents etc etc ... history of the monument with summary to create more impact on the

youth experience" While the latter quote spoke of future developments in terms of sound, both of them discussed how the mechanisms of technology enable museum experts to create different ways to gain access to information. As a result, any audience of any age can experience information about the museum experience in a way which suits them better. The ability of technology to create multi-faceted experiences, reduce search cost by offering the age group their experience of choice, thus creating value for different age groups. Generally, the experience offered by technology, which is described as an additional experience in the museum experience, is a crucial player in the mitigation of credence attributes since it provides experience attributes to a good which is considered apart of the market of credence goods. .

4.1.2.2) Long term effects of a interactive experience

Although the interactive experience lowers a museum experience's credence attributes, they are unable to create a long term relationship with their audience members. The interactive experience will attract a younger generation and they will benefit from the experience. However, the younger generation obtains value from the technology experience in tandem to the museum but not the museum experience alone. Therefore, there was no long term diversification of this target audience group as they will only come for a singular product- one with technology. Therefore, museums are only able to lower their credence attributes for a certain audience when they experience the museum experience with technology. Although the section will argue that the museums in the sample failed to produce long term diversification with interactive experiences, Artivive and the Arc the Triomphe do present a case where a long term lowering of the credence attributes can occur.

All museums interviewed cited that their interactive workshops were successful and sparked interest in the younger generation. Art&Public stated, "the Museums which we worked with were extremely satisfied and the participants were as well. Therefore, other museums asked us to work with them". The Musee des Bozar public manager stated, "success is measured by… Yeah…. actually the impact of this project on the young people". This was expressed in terms of alumni returning and then repeating their workshop over the years. The CEO of Artitive detailed a survey they had conducted:

> "So what we did was, when people left the museums, we asked them a bunch of questions, and some of them were like, do you think that this technology, elevated experience in the museum, and we were very surprised to see that, you know, from one to 10, we've got a range of I think 9.2. And this was through all ages."

All interviews reveal a general success in using interactive characteristics. Stated differently, the museum audience's trust in the museum experience which holds credence attributes evolved from their positive experience with the technology.

However, the data from the interviews cited different abilities in sustaining relationships with their audience outside of the projects. The musee des Bozar, the Musee Art & Marges were unable to sustain their relationship with their audiences after the use of technology with interactive characteristics. The following are answers to questions about the museum's relationship with the members after giving these workshops with interactive technologies. As Ekaterina from Bozar stated "…when the project is over, we don't have a direct relationship with these young people because of the nature of the projects, actually, because we are not linked with them directly". Similarly, Art & Marges did express observing a few young participants coming back with their parents into the museum to show their exhibited projects but they noted it was not "the norm". Despite the success of the workshops, museums did not benefit from their audience returning outside these workshops. These interviews reveal technology's interactive characteristics as adding value to the project itself and not the whole museum experience. The technology in itself did not provide enough information to lower the credence attributes of the general museum experience.

In comparison, museum experts who worked with apps, generally spoke of a successful use of technology with interactive characteristics as adding value to the global museum experience. The following answered a question on how to correctly use interactive mechanisms to innovate. The two interviewees who worked with apps were the CEO of Artivive and Vivianna from the Arc de Triomphe. The CEO of Artivive stated,

> "The moment that people are like, "museums are deciding to offer this interactivity", they should see it as a process and not like a project. Because, you know, most of the museums are like, "oh, bang the VR glasses", and they put the VR glasses out there. They do it, and then they want it to run for five years, and they believe they don't have to change anything. Which in you know, with technology, it's never the case, because the analogy is outdated, very fast. So that's, I think it's a mindset, it shouldn't be one time thing and a project, it should be like, a process"

Artivive stated that in being able to create long-term relationships with audiences, they need to mindfully utilize the technology instead of advertising it as another technological experience. The app creates value for the whole museum experience. The technological experience adds value to the museum experience, thus the museum experience benefits from the experience created by the technology and not the soul technology in itself. Not only did apps target the whole museum experience but confirmed the museum's international reputation. The app became a signal of value to the museum visitors. Vivianna described an

app as adding value to the museum experience because it brought the content of the museum collection to an international level. She stated, “And it is something that many other museums and monuments have. So yeah, it is quite important for us to be at the same level of discussion because we are international”. Therefore, the museums are able to build long-term confidence in their audience members by elevating the content to an “international” level and target the whole museum experience. In this case, the app mitigation of credence attribute produces higher chances of audience diversification

The general sample of museums had a difficult time creating a long term relationship with the target audience members therefore failing to an extent to diversify their audience base. On the one hand, the younger generation tended to be attracted by museums with marketing activities which utilized technology. The activities focused more on the technology in itself instead of the content being portrayed. In providing activities with technology, the technology is a gimmick instead of a meaningful element in a larger museum experience. This resulted in the lack of long term audience diversification for the main museum experience in itself but did provide mitigated credence attributes for the museum experience with technology. On the other hand, the use of apps which have an inherent interactive mechanism provided excellent long term benefits to diversify the audience members. The apps enhanced the overall museum experience for differently aged museum members and did not detract from it. Generally, interactivity features should benefit the content produced instead of putting the emphasis on the technology in itself in order to lower the credence attributes and thus create long term diversification.

4.1.2.3) Participatory strategies - being hands-on

The credence attributes of the museum experience were valued when the interactive characteristics of technology lead to participatory strategies. Five out of seven interviewed museum experts utilized or discussed the benefits of participatory strategies except the Arc the Triomphe and The Musee Horta. In the context of this thesis, participation meant that the participants were working with the museum to create a work of art and not being passive observers of art, thus, an active participants. The following detailed how museums used these participatory strategies and their impact. The CEO of Artivive stated:

> The most powerful thing is you're not just going to consume, but you're also able to add, you know, your view… you know, put your impression and then you know, the museum becomes part of you and you're part of the museum. The thing that's the most important part that museums should start offering to stay relevant.

Additionally, Ykje Wildenborg from the Antwerp Fashion Museum stated: “...we try to with a group of users to create user generated content by inviting them in showing them the pieces of the collections and

by helping them go through the Thesaurus". In inviting individuals to help, museums can have a more thorough collection which takes into account the general population's knowledge of the artifacts. The other interviewees held workshops where museum visitors created content which would later be exhibited. Ekaterina stated these workshops enabled museum visitors to be active participants. She said, "But so do you also think that the younger generation really enjoys having that voice in the museum like they this is what brings them to the museum". The data from the interviews show how interactive exhibitions open up possibilities in having museum visitors become active participants in the museum through their contribution in museum exhibitions and collections. In this sense, the museum visitors becomes integrated in building the museum collection with museum experts. In creating the museum collection, they become experts of the collection themselves are thus understand the value of their created artifact. As a result, participatory strategies mitigate credence attributes.

Art&Public, Art & Marges, Artivive and the Musee des Bozar used technology with interactive mechanisms to invite visitors to participate in museum topics which are difficult to understand for them. In visitors co-creating in developing certain topics, these topics become more digestible and understandable for a population which might not have been previously initiated to them. The following citations illustrate how technology with interactive mechanisms enabled museums to create more digestible topics through participatory strategies. The project manager of Art&Public stated that:

> "It is our goal to use video games as a tool and not for its ends. It is to help a younger population be more aware of certain themes. Also, video games interest younger people more. Because it is true that when we speak of video games, it interests the youngsters more and it helps them to participate more easily into subjects which are not that easily understood by them or motivating".

The Musee des Bozar stated, "participation actually also includes interaction, but it gives more agency to the youngsters to, to bring their input as well. And we also try to learn from them. And it's discovering things together. It's not from the position of a big institution imposing, let's say a story, or a narrative, and the youngsters passively listening". Both stated how participatory strategies help build content which is more easily understood.

However, there is a limit in the success of participatory strategies in lowering credence attributes. Generally, not all potential members will participate in these participatory strategies which makes their voice unheard. When asked "are you afraid that if you don't use certain words, maybe a certain group of people will not find the objects in the database?" to Ykje Wildenborg of the Antwerp Fashion Museum, she stated,

> "Of course, that is important, it is important when you describe an object to use as many words as possible. That is also something we think about when describing objects. But at the same time, we hope that, for example, through using a database, that at least English speaking people can use your collection, which is very important. But to make sure that immediately we have all the languages of the world that are out of the scope. That is impossible."

This statement shows the limitation in using participatory strategies. In addition, the statement shows that museums cannot cater to all potential museum visitors and, therefore, will be unable to lower the credence attributes of certain target audiences.

In utilizing these participatory tactics, the visitor becomes active participants where they participate in creating their own museum experience. In becoming an active participant, the visitor becomes a museum expert themselves but also frames the museum knowledge in a manner which they can understand. As explained the expert provides confidence and verification of the credence good's status to offer utility to the consumer as explained by Ekelund & Thornton (2019). By making the visitor in an expert, they no longer need to rely on the expert and create their own utility. This creates a museum experience which has more value and thus mitigates the credence attributes. In mitigating the credence attributes, interviewees hope it changes the conception of museums as being "patriarchal institutions" but one which seeks to collaborate with their audience to create knowledge. The rebranding of the museum's traditional identity as a patriarchal institution helped visitors gain confidence in the museum's credence attributes.

4.1.2.3.1) The place of the expert

The expert played a big part in giving assurance to the participant about the museum's credence goods. The position of the human expert was highly present when using technology with interactive characteristics for younger generations or marginalized populations for three of the interviews. Art&Public who worked with Art & Marges and le Musee des Bozar, both, worked with experts and utilized them in similar ways. Art&Public stated, "there…so we don't end discussions and then we leave. No, we ask them, what did you get out of our discussion on these themes? And what do you want to talk about from these subjects? We motivate them and then it is up to them to create a video game". From this interview, an expert was viewed as a mentor and someone who pushes them to delve into a topic which they like. Le musee des Bozar holds a similar definition, "an expert we mean somebody who advises on a

young person from a societal perspective, it could be a politician, or or a journalist or an activist, a scientist, somebody who kind of gives a broader perspective on the subject of the project". Both institutions utilize an expert which will act as a mentor when developing themselves on a topic of their choice. These experts gave them confidence in the value of the consumed credence good.
The expert's input on the topic dealt by the technological experience had long-term effects. The following stated this intention. Ekaterina from le Musee des Bozar stated:

> I think the creative part of the project is very important for the young people, because they like to discover things, they work with artists, they learn new techniques, they, they're busy with expressing themselves expressing their thoughts, their worries…So if the subject is interesting for them… and having this group dynamic with an expert, they get encouragement to delve deeper into a subject and attempt to express themselves. Participating in something artistic and creative helps them understand techniques which make them long term participants in our organization" Hopefully, " Bozar becomes more accessible, and connections are created with the younger generation to make it more inclusive".

Art&Public stated, "when we evaluate the workshop and ask the members, what they usually have learned is what they worked on in their video game. Therefore, it's true that the topic they worked on in their video game has a more lasting impact on what they will remember". Their help is credited as influencing visitors to continue delving in the topic of their choice and gain utility from forging a personal interest on topics which they had to deal with at the museum. The expert position in the participatory strategies were substitutes for verification of the knowledge acquired in museum experience. In having experts, the younger generation gained long-term confidence in the quality of the information they have acquired.

Artivive, Arc the Triomphe and the Musee Horta differed greatly in their use of the expert from the other cases since they were all three electronic. The following describe how an e-expert is embedded in the technological aspects of the museum experience. The CEO of Artivive stated:

> "But I think at the same time, it's very important to have a very streamed live user experience. In our case, you install the app, and then it's just going to the camera app. So you don't have to scan any QR codes, you don't have to, you know, it's just camera pointing as artwork runs automatically. And then if you move the phone, it stops. And I think this was also vital to you know, you have a very easy and streamlined experience, where we didn't have to explain to the user how to use it. "

Vivianna from the Arc the Triomphe stated,

> "There are different ways to encode information related to special needs. Yeah. So, like for the young audience, of course, who will have to develop a specific graphic identity and also to write tests in a more funny way."

Both embedded the expert in the technology's technical characteristics. The expert was found in the manner in which both decided to present the information. While Artivive worked on streamlining the information, Vivianna believed in the aesthetic presentation of the information as crucial to the museum consumers. In these cases, the expert is the technology's aesthetic characteristics. The consumer confidence in the museum experience credence attributes is built from the aesthetic experience of the technology. The Musee Horta differentiated itself from all the cases since it did not have an embedded expert. Le Musee Horta used an e-expert which pushed visitors to further delve into the topic of Art Nouveau. When visiting the website to visit a 3D exhibition, the visitor is offered the ability to listen to another video that explains how to visit the 3D exhibition. Regardless of how the expert was present, they were utilized as a substitute for the verification of the information quality of a museum experience. In that sense, audience members were able to gain trust in the museum experience's credence attributes.

4.2) Connectivity

The previous section described how there was not enough audience diversification due to the museum experience's credence attributes. The museum experience's credence attributes are further exacerbated by the asymmetric information in the museum experience market, specifically for the younger generation and marginalized population. By using a diversity of technologies with interactive and connectivity characteristics, museums can provide diverse solutions to attract audience members which are not a part of their core market. This section will delve into how the driver of connectivity has increased audience diversification by lowering the information asymmetry. In lowering the information asymmetry, visitors can better assess if the product is a lemon.

4.2.1)Connectivity as a solution to information asymmetry

One reason there is not enough audience diversification in museums is the high information asymmetry for certain audience members. Audience members outside of the museum's core market cannot assess a museum exhibition's quality and accurately understand the utility gained from consuming the experience. One way to reduce the high information asymmetry is by using technology with

connectivity mechanisms. As described in chapter 2, technology with connectivity mechanisms are social media platforms. When asked about their use of technology with connectivity mechanisms, the interviewees generally stated the same social media platforms. Projectspace, the Musee des Bozar, Arc the Triomphe, Art & Marges, Artivive and the Musee d'Horta, all used Instagram and YouTube. Five out of six of the interviewees used Facebook. Three out of five interviews used a newsletter. Two out of five of the interviewees used influencers; the Musee des Bozar used influencers and Projectspace used streamers. No interviewee used Tik Tok but the Musee des Bozars, Art & Marges and the Musee Horta did express their opinions about the platform. Many platforms are used to reduce information asymmetry as each one of them offers information to reduce the information asymmetry so to mitigate supplier opportunism or a misrepresentation of the museum exhibition's qualities.

In using different platforms, each one offers information in a specific way which contributes to reducing information asymmetry. Such is the case that certain platforms can not contribute in providing adequate information to reduce information asymmetry. This is especially reflected when the marketing Manager of Bozar explained why they did not use TikTok. Apart from not having time, the marketing manager explained that the platform scared other museum experts: " it scares them because like for them, we're in the business of really serious arts. And for them Tiktok is still not a very serious platform. It's not viewed as a tool for professional, professional businesses." This citation shows that the reputation behind the platform contributes to the message and to the efficiency in providing the message. Therefore, in order to adequately lower information asymmetry, museums need to be thoughtful in how they benefit from social media's connectivity features.

One way social media platforms reduce information asymmetry by extending the museum experience outside of its museum walls. The extended museum experience acts as an ad for the museum experience in itself. The CEO of Artivive spoke about an image they had animated to become VR when visitors pointed their phone towards it in the Belvedere Museum. The painting was situated just outside the ticketbooth. He noted that multiple people would enter the museum just to experience the VR experience. He stated:

> "this went viral. And then we had people, you know, just coming for having this recording, and then also afterwards sharing. And then they decided then to go to a museum if they're already there…Right… So this was also a way how we could use social media to attract a new target audience and offer them an experience that they can also share. And then they would use the app again in the museum."

As previously stated, the Musee Horta stated, “no, I see this social media as a complement. We have too many visitors, so, social media helps visitors who could not come get a taste”. Along the same line, Vivianna from the Arc the Triomphe made their digital strategies accessible in an app which can be accessed off-site and on-site. The prior citations mark a crucial development in the use of social media and museums. Social media extended the museum experience outside of its wall to reach more audiences and advertised experiences which previously were not a part of the traditional museum. In the case of this research, visitors obtained an understanding that the museums in question provided VR experiences or an in-depth additional guide to their museum for free. Visitors obtain an experience good, prior to the museum experience, to get a sense of the museum experience with VR or if they want to view the authentic experience to contextualize the information provided by the social media content .

For ProjectSpace, sharing their events on social media was primarily to reduce search cost for their visitors. As the Curator stated, “we were kind of trying to put them on a map and make it possible for people to find them”. The act of using social media was not an extension or a complement of the museum experience but rather a vessel for the museum experience’s search attributes. As the CEO of Artivive underlined, the act of sharing became another form of search attribute. In creating viral social media videos of a museum experience, visitors came to experience what they had seen on the video, film themselves and publish the experience for themselves, and enter the museum. The viral video became a way to compare and contrast the experience of museum-goers with themselves and obtain objective information on the museum experience. Institutions using social media resolved the condition of information asymmetry by providing a mix of pre-experience goods or search goods.

In social media increasing and enhancing the museum experience, the museum experience quality is redefined thus, redefining the lemon. The following section will illustrate how information asymmetry is reduced. As well, the section will show how certain use of these drivers can have no effect on information asymmetry and produce a “lemon”. In not utilizing these platforms correctly, museums can inherently deter a targeted audience and create a “lemon” of their museum experience.

4.2.2) Signals to reduce information asymmetry

In general, information asymmetry is resolved in using different types of signals. The museum experience is a bundle of attributes, therefore, experience attributes, influencer marketing, search attributes are used to signal quality. This section will delve into the different ways museums are reducing information asymmetry and the found nuances.

4.2.2.1) experience attributes as a signal in itself

One way to reduce the information asymmetry is by using a digital product that plays a role in quality signaling to inform consumers. Museum experts seek to use the feature of connectivity to extend the museum experience. The communication manager of Art & Marges' primary goal with communication was to extend the museum experience. She stated, "What I care about is not engagement but to extend the museum experience". She said their Instagram should "be a loyal mirror to what this museum represents" As the findings suggest, connectivity features enabled museums to extend themselves creating a pre and post museum experience as detailed in Kufik & al(2015) research. This extension is a complement to the museum experience as detailed in Marty(2007). Later, we understand how the pre-and-post museum experience informs the main museum experience.

In extending the museum experience, the museum experts provided a multiplicity of museum services in these museum experiences which satisfied the needs of a diverse set of visitors, thus innovating in audience diversification. This finding is revealed when asked about the advantages of social media, the following interviewees described positive aspects of social media. The curator of the Musee Horta stated, "There is more of a demand for this museum than we can host. The idea would be to propose content which is more informative and exciting than simply putting photos online and future expo dates. We have a chance to really have fun with social media". Similarly, Art & Marges described social media as crucial for their visitors. The museum represents images that show the "objects, the artistic process of the objects, behind the scenes and more". While the Musee Horta offered additional "informative" and "exciting" content, Art & Marges offered additional behind-the-scenes content by providing the artistic process and how the exhibition was created and thought-through. This extended museum experience provides a variety of products which offer deeper content on the museum experience: what I call the backstage and front-stage of the museum experience. In other words, the museum proposed products with experiential attributes (e.g. "fun", "exciting") that offer a glimpse into the main museum experience, a pre-experience good (Xu &al., 2019). In that sense, these online pre-experience goods became quality signals to the museum experience in itself.

An extended museum experience can offer an online experience in addition to personalized museum experiences. Only the Musee des Bozar and ProjectSpace used this approach. The marketing manager of Bozar reposted and reshared stories of museum visitors onto the Bozar main Instagram page. He shared, "you see people with their experience of them being on the train with their friends heading to the expo being there". Sharing social experiences was a signal that contributed to the quality of the museum experience. Similarly, ProjectSpace discussed sharing stories, stating, "It's like a certain aspect of exhibitions that you have to build in an aesthetic way so that it looks good on pictures for people… and they are happy to share it. But if kind of the whole drive of institution exhibition goes just to that aspect of

it, like it hollows it out, I mean, maybe a bit old school there". The curator understood that sharing stories could attract visitors that view a museum experience as a social experience but believe it had repercussions on the exhibition's quality.

The personalized perspective offers search attributes since consumers gain information that would have otherwise been difficult to obtain offline as explained by Huang & al. (2009) and Kirmani and Roa(2000). In being a search attribute, this renders the information from these posts objective, and makes their act of sharing, factual. By sharing other people's experience, the museum shapes the personalized social experience as a part of the museum experience. This attracted visitors who are searching for a museum experience which provides a social experience. The last interviewee from Projectspace did not express instagram as a tool to extend their exhibition but a communication tool.

Artivive differed from the other interviewees. Artivive used Youtube and Instagram to provide users with "experience attributes" as a signal. The CEO stated: "So you can also look into, we have a bunch of YouTube case studies, videos, about the projects that we did in the museum". They differed from other interviewees because they used "experience attributes" as a signal for their technology and not the museum experience. Therefore, five of the six interviewees social media as an enhancement of the experience- a complement to the exhibition.

In providing a variety of extended experience which deepened the main museum experience, museum experts innovated in audience diversification. In terms of the Musee Horta, this approach attracts visitors who cannot access the museum in itself but this outcome had no effect on information asymmetry of the main museum experience. In addition to non-visitors, the approach of using connectivity features to show the backstage processes attracts visitors that have interest in the general processes which occur to make the main museum experience. The backstage experiences are products found in the post-and-pre experience of the museum that signal visitors about the general quality of the main museum experience by showing the processes which occur to produce the main exhibition. Finally, when museums shared personalized experiences, the visitor's voice became a signal into the main experience. The quality of the museum experience is from its social experience. Thus, an extended museum experience extends the appeal of a museum to the above stated type of visitors.

4.2.2.2) Effectiveness of targeted information inside the social media content

Social media content is formed in specific ways to reduce information asymmetry. Museum experts use platforms such as Facebook and Instagram to post information, known as signals, which informs the potential visitors about their exhibitions. These signals are in the forms of search attributes and explain objective facts about the museums. For instance, location, the name of the museum and more. These

signals attract the core visitors to the main museum experience. Coupled with signals to attract the core visitors, museum experts used specific signals to attract a target audience. In doing so, connectivity features created a museum experience with a variety products which hold different signals, by providing them many of them, every audience member could connect and interest in their ways the main museum experience. Prior(2006) describe technology as no longer providing a singular experience. In economic terms, technology offers different ways to provide signals which create different interpretation of the main museum experience.

Signals work differently in certain contexts which makes some signals less effective at reducing information asymmetry for certain audience members. When these signals become ineffective, they become signals of a lemon to the target audience. All interviewees explicitly detailed how different content shaped the audience members' choices and decisions and were effective in different ways to different audience members. Since they did not have the financial resources to have a person focusing on each platform, most museums focused on the younger generation. In studying the younger generation, the interviewees found that different signals attracted the attention of the younger generation in different ways.

Generally, the interviewees focused on attracting the younger generation. To do so, the social media content was shaped to attract and engage the younger generation in certain specific ways. The marketing manager of Bozar stated, “so because you reach them it’s not that they will like it and engage and follow up on it” for instance “a younger generation doesn't like long content”. As the curator of ProjectSpace detailed, “more dynamic, snappy and shorter content” creates more engagement from the younger generation. The interviewees explained how content needed to be in short-form format and hold certain “codes” to attract the younger generation. In economic terms, these signals were of higher quality for the younger generation than the older generation. For Vivianna, the curator from Arc the Triomphe, she focused on attracting individuals who are faced with certain learning difficulties. She explained the following:

> “...specific way to design the visual content to choose colors and also the way of writing it has to be different in order for them to understand, of course. Every time almost every type of segment of audiences will need a specific encoding of the information.”

The following shows that “visual content”, the “colors”, a specific way of writing, are manners in which people with learning difficulties can obtain information in order to understand the museum experience.

More pertinently, the experience created by the platform could be curated with different audiences in mind. As the marketing manager of Art and Marges stated, "…So yeah, I think if everybody focuses, if there are really focus groups on each type of audience and each type of experience, I guess, I think we can cater to a broad group of people just by having a dedicated team for young people, a dedicated team for the older people…" . In other words, the dream is to have platforms with content that have a mix of signals which targets different groups. Having a mix of signals is crucial since different groups consider different signals as being of quality. However, it is essential to explain that these museums were unable to do this because of the lack of manpower and resources. The lack of resources was an important underlying factor in their lack of work on social media in all interviews.

Three interviewees spoke about their insecurity of finding the correct signals to attract certain audience members. In having ineffective signals, they would not lower the information asymmetry. When asked about the limit in social media, The Marketing Manager of Bozar stated,

> "When I arrived, they had questions about live streaming through platforms like Twitch and, and that kind of stuff. I think, for me, the line is always where you can't like, make everything young and fresh and newest. And if you go too far, like live streaming or stuff, that people will not get the reaction like, "Oh, cool". Rather, people will see us on these platforms and we will be perceived more as trying to be too young. For me, that's the limit when it comes to vlogging, live streaming more and more. That type of stuff, I think it's maybe for the moment, at least too much of a clash with what has been done. So maybe gradually, we could get there. But for me, it's not something that's for the near future"

The curator of Projectspace had a more nuanced answer:

> "is to kind of be flexible. And also maybe try one thing with one exhibition and then like backpedal if it hasn't worked, so maybe it's a good idea in one exhibition to completely go into like a stream, or influence. Then, do an exhibition where things are more quiet. I think you can also, you know, change your tonality and institutions of which are kind of a bit afraid."

Both quoted interviewees expressed their thoughts around live streaming and believed the platform could deter visitors from visiting their artistic space. This is because the platform creates a tone or interpretation of the content which if incorrectly used could deter their targeted population. While the Bozar marketing manager viewed the live streaming platforms as inherently creating a signal where the younger generation would perceive the museum experience as a lemon, the curator of Projectspace felt there would be a place

to experiment. In another sense, while the marketing manager of Bozar felt the tone was ineffective, the curator of Projectspace did not place value onto the tone. Therefore, certain signals, such as the museum's choice of technology, has implications on attracting the targeted audience member. As a result, the museum experts fail to innovate in audience diversification and a negative perception of a signal.

The museum's resources are an important factor in the effective use of their signals. The museum resources were a significant obstacle for museum experts to effectively shape the information in a manner that attracted the diverse target audiences. In order to make signals effective, the interviewees agreed each platform should receive their special attention but they did not have the financial resources. The social media manager from Art and Marges stated: "if we had the resources, we would have a person focusing on one platform. Learn how the platform functions" The manager of Bozar explains this in further detail:

> "But that's the next step actually, in communication is to, like, create a set of all new guidelines that are that are younger and more fresh and more visually appealing and more adapted to each platform we use. A lot of the time the same content gets posted on YouTube and Facebook and Instagram, but the codes are not always the same."

In other words, each platform produces specific content which then needs to be shaped for the specific audience. In other words, the signals/codes of the content would be specifically chosen to attract the attention of the target audience.

In addition museums having a resource problem, museums have bureaucratic issues in implementing social media platforms. The bureaucratic problems were especially present for the TikTok platform. While the other case studies did not implement TikTok because they did not have the resources and time to do so, the Musee des Bozars faced bureaucratic issues. The manager said: "Yeah, so me, starting out, I was like, of course, you need to have a TiKTiK if you want to reach more people". While he saw the capabilities of TikTok, he explained the museum did not approve. He said:

> "It scares them because like for them, we're in the business of really serious arts. And for them TikToK is still not a very serious platform. It's not viewed as a tool for professional, professional businesses. Which is crazy, because like, if you see I think, MOMA in New York has a TikTok, Tate Modern has a TikTok, you know…"

While bigger museums saw the innovative capabilities, the communication team saw the platforms "codes" or "signals" as producing content which downgrades the quality of the artwork. Not only did the

platform's name hold prejudice, but the communication team did not view the benefits of its connectivity feature. Instead, they focused on the platform's reputation. All of the above could have repercussions for museum experts and their attempt to innovate in audience diversification. While trying to attract certain visitors, their initiative could deter others as in the example of TikTok.

4.2.2.3) influencer marketing

Another way social media can reduce information asymmetry is through influencer marketing. The Musee Horta, Bozar, The projectspace, all but Art & Marges, spoke of influencers as a useful marketing technique. In utilizing influencers, potential clients can screen a museum experience through the influencer in themselves. The marketing manager of Bozar stated that,

> "And so, we went over all the communication that was done, and also the influencer marketing that we did. And when they saw the numbers, the results were really interesting in seeing how, "Okay, so it's, it's actually effective". It's not just like silly kids doing dances can actually help us, like sell more tickets and just like, sell the narrative better".

From this, the museum viewed influencers as providing a better "narrative"; they were better mediators of the museum experience. The influencer's narrative in the form of their voice are a trustmarker, symbols of reliability (Aiken & al, 2004). In the case of the Musee des Bozar, the chosen influencers' narrative acts as a trustmarker becoming a signal for the younger generation and is able to lower the information asymmetry they are experiencing towards the museum experience. The influencer's narrative and with that, the influencer in themselves, is the signal which lowers information asymmetry for the community that follows them. Not all museums used influencer marketing.

In comparison to the Musee des Bozar and Projectspace, Musee Horta and Art & Marges stood as an anomaly. Musee Horta does value influencer marketing but have had difficulty in putting it in place due to their museum in itself. Their museum is inside the house of the famous architect, Victor Horta. This makes the house in itself a part of the museum experience. Therefore, they are afraid that in taking photos or videos, influencers could bump into objects by mistake or create jams. Preserving the architectural integrity of the museum took priority over the museum's marketing strategies. This shows a museum valuing their educational priorities over their commercial goals. Art & Marges lack of interest in influencer marketing stemmed from their interest in an audience that is more accustomed to institutions. Compared to the rest of the interviewees, Art & Marges wanted to target audiences who are used to museums since their own core market is an audience which is more alternative. Instead of using influencers which would target a younger audience, Art&Marge seeked to advertise on Musique 3, a radio

station of classical music. In this case, the platform's core selling point, being classical music, is in itself a signal which lowers the information asymmetry of traditional museumgoers. In gaining these perspectives, Influencer marketing can reduce the information asymmetry for specific target audiences.

4.2.2.4) Search Attributes

Instagram reduced information asymmetry through search for good attributes. The museum experience's observable facts on social media platforms are "search attributes" (Huang & al., 2009). These search attributes provide information which are essential to reduce information asymmetry about the museum experience.

The Internet has an ability to offer easy information search, especially on Instagram. Interviewees detailed how they gave information through their social platforms. When asked about how they use Instagram to spread information, they said various things. Information is spread by a detailed description of the exhibition in which it states the location, date, museum name, price of the exhibition, titles and the photo itself. All these aspects of the museum experience are objective and easily discoverable. Moreover, the multiple different photos of exhibitions on the institution's platform help the user compare photos to one another and obtain a "general idea of the museum" as explained by the communication manager of Art & Marges. More explicitly, she highly valued the idea of "extending the museum experience" and showing "what is happening backstage". The photos not only show a general idea of the museum but what is happening behind closed doors. Everything detailed and posted are ways in which audience members can gain knowledge on the exhibition they might seek to visit but they also gain deeper insight into what happens in the actual exhibition.

There is, however, a limit in providing search attributes. The marketing manager of Bozar stated:

> "…a lot of events happening every week. And sometimes you have an expo and at the same time, the film at the same time, a concert on the same day. So it's a lot of communication to be had, with a limited amount of slots to communicate also with like, social media, algorithms and stuff. So it can't be you can post 10 things a day. So that's already a lot of work for them."

The quote reveals that there is so much information to share that marketing managers have difficulty in creating the content. Therefore, they have to pick and choose what information is shared. Museum experts utilize search attributes to a limit because the technical features of the connectivity mechanism has limitations in itself.

While prior interviewees detailed the prior information as important content to post, none of them spoke of language. Language can also be a search attribute. For the ProjectSpace, the curator expressed:

“And we also kind of actually, the language aspect of it, everything was always bilingual, English, Chinese, but certain things would be kind of highlighted more in one language.” The choice of language is crucial to correctly cater to their audiences. The lack of language choices could heighten the information asymmetry and deter visitors who do not understand the language. The choice of language is crucial to correctly cater to a diversity of audiences.

Compared to the other interviewees, the use of social media by Artivive differed. As the other interviewees, Artivive uses dates, price, titles and more to provide search attributes. However, their search attributes were not based around the museum experience in general but on the virtual reality technology of Artivive. The CEO of Artivive pointed to video titles such as “The Augmented Reality Art Tool”, “Art-Step-by-Step guide”. Consumers gain knowledge of the technology, how it is used, how it looks like and more prior to their museum visit. Due to the newness of the technology, reducing the information asymmetry of the technology itself is of higher priority than the museum experience itself. However, one could argue that the easy guide to technology directly reflects on the quality of the museum experience. Being easy to use, the museum experience could be easy to interpret. In reducing the information asymmetry toward the technological component of the museum experience, the museum ensures to attract visitors who are more interested in technology.

Engagement is another important search attribute which was noted by the interviewees. Five on six is considered high engagement a successful marketing by most interviewees since it creates a “buzz” around an event. The communication manager described people answering in their comments as “hyperlikes” since they were expressing twice as much enthusiasm for an event. Artivive did not produce events nor offer a comment section but, however, offered users the opportunity to “follow” museums or artists and “like” the works of art. In general, all interviewees offered a section where people could comment. For instance, people exchanged their opinion about the museum’s event in the comments. The marketing manager of Bozar stated,

> “But just creating excitement around the events…is important when we market…so yeah for me it's engagements- people actually asking questions. If people answer with a DM like asking for information about our exhibition or about the artists or when you see that there's a real buzz going on… For me, that's how you view that the campaign is being effective”.

The Musee Horta agreed that high engagement was crucial and was just starting to do work on this. He stated they had prepared “ a series of answers to post on the Google reviews”. From these quotes, the high level of information exchange from engagement on the platform can be considered search attributes. In

other words, electronic word of mouth occurs. Therefore social media expanded search attributes by providing an avenue under each post to have electronic conversations. These electronic conversations as the quotes suggest provide information prior to the purchase of an experience, thus reducing information asymmetry.

As previously stated, search attributes for a museum experience could be found in the Instagram post and/or through engagement. All interviewees cited that engagement was a necessary requirement for a successful Instagram post. However a few cited the difficulty in attaining high engagement. The museum usually lacks the resources to focus on producing engagement as expressed by le Musee Horta. The communication manager of Art&Marges stated that "we have tried to produce posts that will ask for more engagement but it never worked. And there is nothing worse than that. For instance, when there are only two answers. Then, that becomes terrible for our branding. So I stir away from these kinds of posts. From these quotes, there is an understanding that creating a post with engagement is a sign of success but they are difficult to have. If ineffectively done, engagement can produce a negative search attribute and have repercussions. This reveals that museums as Art & Marges and the Musee Horta value more search goods than experience goods out of precaution

Museum experts highly valued "engagement", real-time online discussion, and the resulting "community" which comes from it. A community is defined by the communication manager of Art & Marges. She says, by people commenting in the comment section, "they were reaffirming the community which follows them". The museum expert described the online museum comment section as being a space where visitors could be a part of their community. Museum experts believe that "engagement" influence the user decision process to come to a museum because it is influenced by communicating with other members of their ``community". The marketing manager of Bozar more explicitly spoke of this:

> "Because influencers know what young people are like and they have their community already. It's easier to actually… if you have a budget of 300 euros for example. You can spend it on Ads, right, or spend it on an influencer from the community and they post on their channels or like cross posting with us, because you know that you will automatically reach people that have already have similar interests, rather than posting it on our page with the same budget…"

The quote explains that a museum manager would have more difficulties in targeting the influencer's community than the influencer itself. The Influencer knows how to advertise the information correctly to convince their community to consume the museum experience. The data reveals that certain visitors' information asymmetry is reduced when it is shaped in terms of being a part of a community. The quotes

did not show the dialogue to facilitate the interpretation of the museum experience but rather be a signal in itself to push visitors to visit the museum.

What is observed from these interviews is that connectivity characteristics expanded the types of information accessible prior to purchase to reduce information asymmetry. In being on the internet, the use of social media leaned towards providing more search attributes. This was especially accentuated in combining multiple social media platforms together. Most museums strived in offering search attributes but the effectiveness of the information is greatly influenced for instance in the case of "engagement" and who was signaling the information. In addition to search attributes, experience attributes played a part in reducing information asymmetry. Generally, the use of social media proved fruitful in reducing information asymmetry to increase audience diversification..

5) Discussion and conclusion

The previous chapter looked into the antecedents of interactivity and connectivity innovating in audience diversification. Overall, the research pointed to the continued ability of new technology to radically innovate in audience diversification which is in accordance with multiple academic papers discussed in chapter two (Bakhshi & Throsby, 2009; Ekelund & Thornton, 2019; Camarero & Garrido, 2012). Chapter four developed Bakshi and Throsby (2009) conceptual model of technology's ICT features, specifically the features of interactivity and connectivity, which drive audience diversification. This chapter will explain how the research successfully extends Bakhshi and Throsby (2009)'s conceptual framework in relation to prior research conducted in chapter two. This research analyzes these features in a museum context to understand the antecedents before the event occurs. In diving into these antecedents, the research finds that the features of interactivity and connectivity do not inherently increase audience diversification. Despite new technology providing a variety of ways to inform visitors of the quality of the museum experience, certain approaches to the use of these two ICT features can create an information problem for certain types of visitors. It is important to note that the case studies mostly focused on diversifying their target base by attracting the younger generation

5.1)Discussion

The research observed technology being used with the goal to be user-centered (Meng & al., 2022) which enabled museums to consider the visitor's diverse needs and increase in audience diversification. To do so, museum experts used the feature of interactivity to increase audience diversification by mitigating credence attributes. Interactivity features provides more variety of attributes to the museum experience which inherently has a higher proportion of credence attributes. In providing a variety of attributes, experts ensures that visitors who cannot obtain utility from credence attributes will obtain it in other forms. This created a democratized learning space to reach new audiences from all backgrounds, and offered a variety of learning experience which suits the audience's pedagogical needs as expressed by (Witcomb, 2006). In doing so, visitors from all pedagogical needs experienced an increased utility. In accordance with Tallon (2008), in adhering to different pedagogical needs, the interactivity features create new museum experiences for each visitor. The feature of connectivity increases audience diversification by lowering information asymmetry. The findings found that museum experts achieved this by targeting the information to specific audiences in accordance with Arends et al., 2009. However, the ability of new technology to increase audience diversification resulted from a specific manipulation of these characteristics. The characteristics of interactivity and connectivity were studied as separate entities and understood as strategies museums can use to diversify their audience base.

5.1.1) Credence attributes and their implication on audience diversification

The research argues that museums and the product of a museum experience has credence attributes. If a museum has credence attributes this has significant implications on their ability to diversify their audience base because museums are unable to build lasting relationships with audience members since these potential consumers cannot assess the quality of the museum experience and gain value from it.

The research shows that the museum's credence attributes is dependent on the credence given to the good by others. The interviewees stated that the museum was viewed as being "exclusive", "elitist" and "classical", which is a reputation brought from the people that frequented the space. The credence attributes of a museum experience are in line with Giacalone (2006), who stated the people play a part in labeling the good as a credence good. Furthermore, the presence of the traditional core audiences being the elite created a reputation for the museum as being inaccessible and not inclusive for the younger generation. The marketing manager of Bozar stated that the younger generation did not view museums as accessible because they associated the museum to the activities of the king and queens. This is in

accordance to Kotler and Kotler (1998) that states that a reference group plays an important role in people visiting. The activities of the king and queens were exclusively associated with the status of the cultural event. As a result, the king and queens signal to a younger generation that they are unable to gain utility from the museum experience since they are not of similar prestige and status. Therefore, the reference group reinforces the status of the credence good as having unobtainable utility.

In using interactivity characteristics, museums professionals goal was to provide information through the use of interactive technology to help the younger and marginalized population have the keys to identify the quality of a museum experience. This research argues that museums successfully reduced the credence attributes of their museum experience through the use of technology with interactive characteristics. Museum experts expressed that the use of interactive technology in the museum space had been a success. The success of interactive technology is measured through multiple editions, returning participants and the results of quantitative surveys. Overall visitor satisfaction expresses a successful mitigation of credence attributes which entails that the museum experience is of value for them. As scholars state, credence good refers to aspects of the product that are difficult for consumers to verify even after use, therefore, they are unable to attain utility directly after the consumption of the good (Darby and Karni, 1973). Clearly, the credence attributes were successfully reduced since the consumer understood the quality of the product and gained value from their experience.

5.1.1.1) The nuances in mitigating credence attributes by providing multiple experiences

As previously explained, a museum experience is a credence good but the feature of interactivity was able to mitigate this attributes. This section delves into how this occurred. Museums were able to mitigate credence attributes by providing different approaches to offering educational knowledge about the main museum experience as explained by Hawkey (2003). As a result, the museum could market different educational narratives to different visitors which is in accordance with Burton and Scott(2003)'s research. In providing personalized information in an interactive museum experience, visitors with different expertise levels can better assess the quality of the main museum experience.

Interactivity characteristics create new experiences in tandem with technology which is layered on top of the actual museum experience. This experience offers multiple different contexts for the target audience to assess product quality. The research shows this when Artivive's CEO spoke of VR's ability to provide a "new experience" that suits any visitor and changes their perspective on art. The CEO meant that a new museum consumer was able to gain value from the museum experience just as much as expert consumers. Artivive's CEO expressed that individuals in their 60 and 70s, who are experts in art,

expressed that their VR experience from Artivive had added value to their museum experience. Regardless of expertise, VR experiences offer multiple different experiences that satisfy and create value for different audiences. In the other cases, interviewers focused on one target group and used video games, photography or more to create an additional layer to the museum experience. These layers gave the relevant information needed for the target group to gain value from the actual museum experience. As Ford, Smith and Swasy(1988) argue, credence goods are dependent on the level of expertise of the average consumer. These technologies benefit consumers and mitigate credence attributes by providing the necessary experience to add value for the visitor. While most interviews focused on adding one experience, Artivive's interactive characteristics provided multiple experiences which benefited visitors with different expertise levels. Thus, Artivive was able to innovate in audience diversification at a higher degree.

The Musee Horta proved to be an anomaly due to its 3D reconstruction of an Art Nouveau House being published online. Contrary to other data, the Musee Horta's use of technology with interactive characteristics was labeled as an extension of the museum experience and not a new experience with added value. The online context of the 3D reconstruction does not alter the ability of consumers to judge product quality before purchase. Rather, the 3D museum experience is viewed as a complement to the physical museum experience, thus, something that adds to the museum experience after the initial consumption of the physical museum experience. Xu & al.(2019) detailed a pre-experience good which allows the consumer to get a sense of the physical product prior to purchase. In the case of these interviews, the 3D reconstruction is a post-experience good which allows the consumer to add value to their physical experience. The visitors obtained a historical layer to their initial main museum experience. Therefore, the online context of the 3D museum experience took precedence over the interactive technology ability to mediate a new experience and mitigate the credence attributes. Interactive characteristics provide one or multiple new experiences to the museum experience which add value to the actual experience. This was not the case in the context of the Musee Horta which is impacted by the interactive experience being on the internet. Therefore, it is essential that a museum expert must utilize interactive characteristics in a museum experience and not outside the actual museum walls

5.1.1.2) The nuances in mitigating credence attributes by its context-dependency

The ability of participants to evaluate the quality of a credence good is context-dependent. The research showed that museum professionals were unable to retain their target market, being the younger generation, outside of the museum experience in tandem with interactive technology. The museum experts strategy was to create a technologically mediated experience which makes the main museum experience

more accessible or graspable for a variety of visitors. These technological mediated experiences act as an "experience attribute". Visitors consume them to understand the quality of the product (Girard & Dion, 2010), the product being the museum experience. Interactive features therefore provide the technical capabilities for museum experts to provide different experience goods which satisfy the needs of different visitors. The museum expert's stated intentions towards using interactive features are in line with Campos & al., 2011 and White & Ch'ng, 2019.

Therefore, the target market was invited to participate in diverse workshops (using interactive technology such as cameras, film, or video games) offered by the museums or the VR guide offered by Artivive. The workshop or VR experience had similar objectives. The workshop has educational objects where participants learn about an art form in using these technologies with interactive characteristics. The VR guide's mission is to offer a historical account of the works of art in the museum collection. Both use of technology with these interactive successfully lowered credence attributes by providing reliable information on the art works which enhanced the museum educational value for these participants.

However, the findings found that the lowering of the credence attributes was context dependent for the younger generation. As the findings show, the younger generation's ability to assess product quality due to the mitigation of credence attributes is problematic because the results are contingent on the museum experience in tandem with technology. This is a result of interactive technology being a significant mediation channel for participants to properly diagnose the museum experience. The context dependent nature of the museum experience credence attributes is in line with Huang, Lurie and Mitra's study (2009). As a result, museums are able to attract a younger generation but are unable to build long-term relationships with these participants outside of technological experience. Therefore, interactive features mitigate credence attributes for an experience at the museum experience but not for the museum experience in itself.

Contrary to previous cases, Artivive's CEO created an intention to revisit the museum experience. For Artivive, their philosophy on technology is that it "elevates" the museum experience. Technology enhanced the museum but is not the experience in itself. The other cases failed in contrast to Artivive because the technological experience became the product instead of an experience attributed to the museum experience. This anomaly suggests that the previous cases failed in applying the visitor orientation strategy to its fullest extent to produce long-term effects. As Di Pietro and al.(2014) and Meng & al. (2022) stated, this strategy increases the users satisfaction and their intention to revisit. Undoubtedly, museum experts' heavy reliance on the technological mediation offered by these interactive features attract a younger generation but does not satisfy their needs to ensure a visit of the museum experience without technology.

In using an app, the app's interactive features supply the consumer with a variety of goods. Instead of targeting only a part of the museum experience, the app targets the whole museum experience and has more opportunities to create new experiences. By providing a variety of new experiences, the museum experts provide additional categories of attributes apart from the museum experience's credence attributes. This finding is in line with Alba &al. (1997) which states that cultural goods have a mixture of attributes. In providing a mixture of attributes, further enhanced by technology, museum experts ensure that visitors will obtain utility in a certain manner and experience mitigated credence attributes.

5.1.1.3) The nuances in mitigating credence attributes through its participatory strategies

The research showed that interactive characteristics benefited the mitigation of credence attributes through participatory strategies. In the context of this thesis, participatory strategies are consumers participating in the development of the main museum experience with an expert. These participatory strategies were differently constructed in different interviews. A few interviewers spoke of participatory strategies being the museum-goer participating in the construction of the main museum experience as an independent entity. Other interviewers spoke of participatory strategies being the museum-goer participating in the construction of the main museum experience with an expert. In both cases, the museum-goer's voice participates in building their museum experience which is in accordance with Jung & al. (2019) and Witcomb (2006).

In the former, the interviewers discussed how museum-goers created museum databases and museum content facilitated by the use of interactive characteristics to better interpret the museum experience. In asking the visitor to participate, these participatory strategies shift the consumer from a passive to an active museum visitor as in (Macdonald, 2010; Tomiuc, 2014). In being an active museum visitor, their voice contributes to the museum collection enabling a better comprehension and interpretation of the museum experience. In becoming an active contributor, the visitor personalises their museum learning experience. This finding is in accordance to Not & Petrelli(2019) who defined this personalised learning environment as a do-it-yourself approach. In using interactivity features to personalise the museum experience, curators create a do-it-yourself good which enables them to cater to a variety of users and increase their utility. In that sense, they are able to mitigate credence attributes by using a do-it-yourself good.

In the latter attempts at participatory strategies, the expert played a significant position in these participatory strategies to reduce credence attributes of a museum experience. The data shows that the experts were essential in providing a successful experience. The expert was found in many forms. Either

the expert was an actual person or embedded in the technology itself being an e-expert. In having an expert, the visitor receives a hand in the interpretation of the museum experience and provides confidence to the visitor. The expert becomes essential in providing utility to the museum experience. As a result, the experts stands in as a proxy for these consumers, they offer them confidence in their museum experience and gain utility from this confidence. This finding is in line with Ekelund and Thornton(2019) study on Meta-credence goods that found that consumers relied on expert's opinion as a verification in the status of the credence goods. The data showed that an expert is essential in terms of creating a lasting-confidence in the credence good rather than solely providing consumers with the ability to contribute to the museum experience. Thus, credence is mitigated by providing a do-it-yourself good and experts are used to counteract the lasting credence attributes which are experienced by the user. Experts mitigate credence attributes in providing confidence ot the users.

5.1.2) Information asymmetry and their implication on audience diversification

In addition to interactive characteristics, the research showed how connectivity features played a part in audience diversification. The outcome of applying connectivity features follows Kuflik and al.(2015) in extending the museum experience, to integrate a post- and-pre museum experience. In providing an extension, a more holistic experience is created. Being a post-and-pre museum experience and being a part of the main museum experience, they inform the user about the main museum experience. By using connectivity features to apply a pre-and-post museum experience to the main museum experience, museum experts provide new types of signals that inform the quality of the main museum experience. These new attributes are experience attributes, influencer marketing, and search attributes to signal quality and, therefore, lower information asymmetry.

5.1.2.1) extending the museum experience to lower information asymmetry

The data revealed that connectivity drives audience diversification by lowering information asymmetry. Generally, the driver of connectivity extends the museum’s scale and scope of its experience to innovate in audience diversification. In doing so, museums create new experiences by extending the museum experience or enhancing it which is in accordance with Tallon’s research (2008). By extending the museum experience, the museum experts are able to share information which is relevant to the

museum experience. In consequence, the museum expert can provide new experiences which are outside the museum walls to entice the offline visitor. This agrees with Marty's research (2007) which found that most traffic to museum websites was for planning a future visit while other forms of traffic are from visitors viewing the museum's resources (which the research calls product). To summarize, the extended museum experience provides information and resources on the main museum experience.

The findings found that museum experts were very adamant about the benefits of using the connectivity features to provide information on the museum but in practice, there are limitations. To provide this information, museum experts use the connectivity features to publish the necessary search attributes, objective information, to inform visitors: date, location, museum, and the diversity of events. Museum experts reason to utilize this approach is as Lee(2012) stated, publishing online is a cost-effective way to reach a global audience. However, the research challenges the perceived use of connectivity features to publish search attributes. The marketing manager of Bozar expressed it himself. He found that there was a limited amount of content that one was able to publish due to the algorithm. The embedded technological features of the connectivity mechanism hinder the ability to publish every event the museum wishes. As a result of the technological features, museum experts are not able to attract the diversity of audiences that they wish which hinders the lowering of information asymmetry.

When analyzing the additional resources of the museum, the findings were contrary to Marty (2007). The research found that museum resources did not substitute the museum experience but were a complementary museum experience. From the interviewees, they used the feature of connectivity to publish behind-the-scenes photos of the museum, their artists' lives, and aesthetically create a holistic picture of the museum. These products or resources provide additional information on the museum experience which has the goal to inform the future visitor on the main museum experience but does not substitute the museum experience. Instead, in the online resources being a part of the museum experience, the experiences provide the visitor with a taste of the museum experience in order for them to be reassured of the quality of the main museum experience. This argument can also be in line with Xu & al.(2019), who described the concept of the pre-experience good. By providing a variety of products in the pre-experience goods, they can act as signals that attract a variety of visitors with different interests. Only one museum expert, Musee Horta, expressed a desire to use the connectivity feature to create a substitute for the main museum experience in order to cater to museum visitors who are unable to enter his museum. In this case, the lack of museum experience substitutes hinder visitors that are unable to visit the museum from coming. Overall, using the approach of publishing complementary resources as a signal to the museum experience's quality, the online products invite a variety of visitors to come inside the museum walls instead of substituting the main museum experience.

5.1.2.2) Perception of Signals

The research's finding found similar results to Sundbo(2009) who stated that technology's medium (the platform) contributes to the museum's experience production. In this case, the technological medium plays a role in the pre-and-post museum experience which the connectivity mechanisms produce. While connectivity features transformed communication practices for museums, the technological medium transforms how the communication is shaped. In other words, each platform shapes the information into their own language creating a unique tone and syntax. This section will discuss how the technological platforms impact the perception the consumer has on the museum experts ,thus, museum experience.

In addition to each platform creating its own language, the language becomes shaped by the user. As in an actual language, the platform holds its own dialects. The findings found that museum experts learned the young generation's dialect on social media platforms to communicate and engage with them. The interviewees found that videos were highly effective with a younger generation if they were to be "short" and "snappy" content. The younger generation did not respond well to longer videos. These approaches to the technological features of the platform created signals that were well perceived by the younger generation.

However, as in an actual language, not using a dialect correctly determines the sender's reputation. As explained, as well, by Gomulya and Mishina (2016), the impact of the signal will be determined by the perception of the quality of the sender. For instance, museum experts used platforms such as Twitch which caused the younger generation to perceive the museum in a negative light. The museum's reputation as a serious institution caused the younger generation to perceive the museum as "trying to be too young". Continuing to fail to use the dialect would deter the younger generation from using the platform. Smaller institutions such as ProjectSpace did not place as much importance on the repercussions that the technological medium could have on the information. If the medium did not shape the information in a manner they wished, the curator stated she would "backpedal". Therefore, the choices of technology have repercussions on the perception the younger generation had on the quality of the museum experience . The research found that the technological medium of the connectivity features impacted the efficacy of the signal which could hinder audience diversification.

5.1.2.3) The nuances in lowering information asymmetry through connectivity features's communication models

The research found that the museum expert's used different communication models as user-to-user, user-to-museum and user-to-many (Russo & al, 2006). These models created a

“community” which is an online space for communication on the social media platforms which create “engagement”. This had advantages and disadvantages in increasing audience diversification. In terms of advantage, museum experts highly valued “engagement” because the increased exchanged information in the form of a “community” acted as a signal for visitors that want to feel a part of a community. By using the model of user-to-user, their effects were in accordance with Russo & al (2006) who stated that users are able to participate in cultural interpretation of works. Visitors are able to explain to others about the quality of the work. Therefore, other users are able to offer information which sheds light on the quality of the work. The information shaped by the interaction was a signal that lowered information asymmetry for audiences which are a part of the museum’s online group. Another advantage was influencer marketing. The findings were in accordance to Trombin & Veglianti (2020), who stated that influencers’ voices offer value to the museum experience because their followers trust them. Influencers are able to interpret the museum experience in a manner that creates utility to the museum visitor. Due to the relationship, the influencer’s narrative is a signal which holds a lot of value in lowering information asymmetry. Overall, information shaped by a community effectively targeted a visitor centered around the community.

The research found that museum experts heavily relied on the museum-to-user communication model of Russo & al (2006) to innovate in audience diversification. The strengths of the model came from the museum’s ability to share a multiplicity of different search attributes to the post-museum experience which act as signals that attract different visitors to the main museum experience. There were three different types of search signals: objective facts of the museum experience, a holistic picture of the museum experience and personalized museum experiences. Museum experts were enthusiastic about their ability to provide a multiplicity of information to their followers compared to using the other models. Fischer & Mantoan(2020) found that most visitors of an online museum website visited the platforms to gain information on the cultural products or events. There was little hedonic consumption. These scholar’s findings give value towards emphasizing the museum-to-user model over others.

These search attributes of the museum-to-user model were more valued than the experience attributes of a pre-museum experience. A user-to-user model creates experience attributes to the pre-museum experience. These experience attributes are perceived as signals to the museum experience. Museum experts expressed that low engagement had detrimental effects on the main museum experience's perceived quality. The research findings on the negative perception of poor engagement and its implication on the museum’s brand reflect Kotler and Kotler(1998) research that found that individuals who consume the good play an important role in influencing people to visit. Therefore, the research argues that a lack of engagement is a signal of negative quality to the museum experience. Instead they relied on search attributes since their objective nature is more easy to control.

5.2) Conclusion

The prior section attempt to interpret the results in relation to the the question: how are museum experts utilizing new technology to increase audience diversification through the two mechanisms of interactivity and connectivity? The discussed findings of Chapter four permits to creates new strategies to ensure that museum experts innovate in audience diversification with a clear understanding in how they approaches to technology could create information problems. Thus, the suggested strategies are built from learning about the antecedents of Bakshi and Throsby's conceptual model. These strategies can be used and transferred to other museum experiences. The following points are these strategies and are split into two sections: interactivity features and connectivity features.

Interactivity features:

- Lowering the credence attributes of a museum experience is extremely difficult for a younger generation. Generally, the credence attributes were not lowered by interactive features but by free entry to the museums. Therefore, in order to diversify the core audience with a younger generation, the museum should incorporate free entry to the museum. The only limitation of this strategy is that it benefits local audiences instead of a wider spectrum of people.
- Interactive features successfully provide one or multiple additional museum experiences- experience goods- to the main museum experience when placed inside museum walls to mitigate credence attributes. As Klein (1988) explained, credence attributes are dependent on the expertise of the average consumer. Therefore, by providing multiple experiences that provide more in-depth or detailed knowledge of the museum, the museum can lower the credence attributes of a diversity of consumers. Moreover, it adds experience good attributes to the credence good, ensuring that utility is experienced as shown in Figure 3.

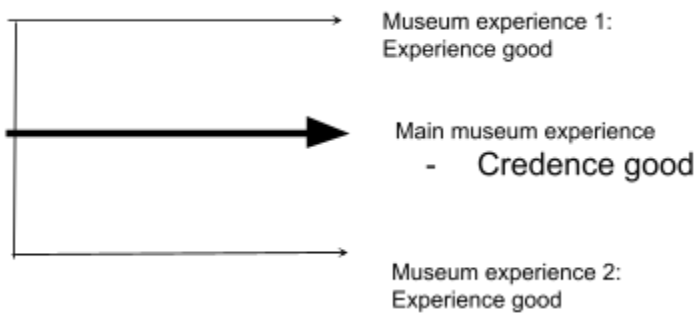

Figure 3: the feature of interactivity provides experience attributes to the museum experience credence attributes to ensure utility is experienced by other visitors

- Museum experts were able to mitigate the credence attributes of the younger generation by providing a technologically mediated experience. Museum experts' failure to appropriately utilise interactive features resulted in the mitigation of credence attributes being context dependent. Although this technique does innovate in audience diversification, museum experts would benefit from using interactivity features as a mediation of the museum experience and not as an experience in itself. This technique results in mitigating the credence attributes of a museum experience as a whole.
- Participatory strategies benefit from the interactivity features to innovate in audience diversification. As explained, participatory strategies are essential in shifting the visitor from a passive to an active visitor which creates a more empowered museum-goer. By creating an active visitor, the museum experience is personalised with a do-it-yourself approach. This helps mitigate the credence attributes. The expert plays an essential part in creating this active visitor and their presence is necessary. They determine the customer's requirement and proscribe them with information to learn in order to be more informed about the product. As a result, they stand in for the credence attributes which were not mitigated from the shift from a passive to active consumer. Experts add a personalized museum experience to the main experience, therefore, they do not mitigate the credence attributes of the main museum experience.

Overall, interactivity features do innovate audience diversification. Museum experts who used apps were more successful in mitigating the credence attributes since they had more opportunities to provide a variety of additional museum experiences. Moreover, apps lower the credence attributes of the main

museum experience compared to interactivity features which were utilised as an experience in themselves.

Connectivity features

- Museum experts can use connectivity features to create an extension of the museum experience called the pre- and-post museum experience/visit. The extension of the museum adds information to the main museum experience which enables a variety of visitors to understand its quality (figure 2).

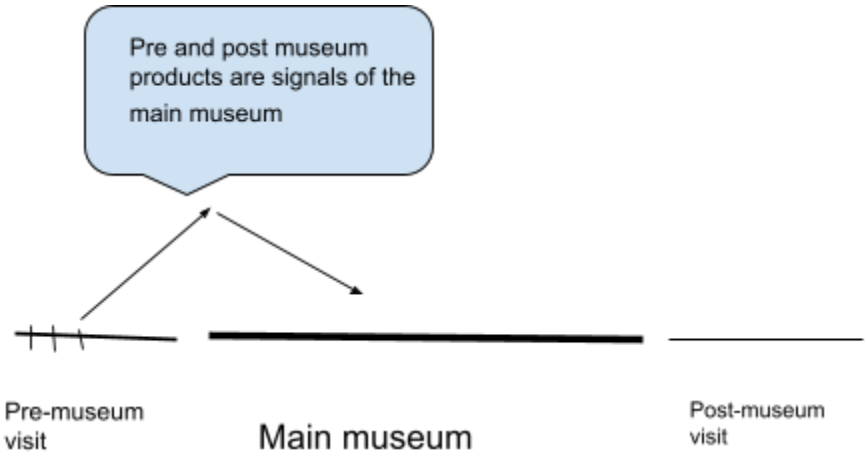

Figure 2: to show the impact of connectivity feature on the main museum experience

- The technological medium has repercussions on the production of the post-and-pre-museum experience. Due to the post-and-pre-museum experience being a signal about the quality of the museum experience, a failure to correctly understand the place of technology in the post-and-pre-museum experience has implications for the main museum experience.
- The connectivity features innovate in audience diversification by providing a variety of communication models: user-to-user, user-to-museum and user-to-many
    - User-to-many model is highly valued for increasing audience diversification. The user understands how to share the museum experience in a manner that is more easily digestible to many followers. However, the model only innovates for one target audience

which is the follower base of one user. Additionally, although a valued model, the model is expensive to implement.

- Museum experts use the user-to-user model to innovate in audience diversification if the information is shaped as being a part of a larger communication.
- User-to-museum model is highly effective at audience diversification. It provides a variety of ways to provide search attributes that can attract different museum visitors.

There are two factors that limit its innovative drive for connectivity features. First, museums lacked resources to invest their time in obtaining the technology's benefits. Technologies with embedded connectivity features play a part in shaping information into a language. Museum experts did not have time to learn each language for each platform and more precisely the dialect that emerged from their use. If museum experts invested their time in learning each dialect, they could innovate in attracting multiple different types of audience. Due to their lack of time, museum experts mostly focus on the younger generation's "dialect". Second, technology in themselves have limits in their ability to communicate with audiences. Museum experts cannot publish everything online because the amount of information would drown users. Therefore, museum experts concentrated on a few target audiences such as the younger generation. Due to the museum's limited resources and technological limitations, museum experts concentrated on extending the museum appeal to one target audience outside of their core audience members - the younger generation. Both of these factors contributed to low rates of audience diversification and instead a simultaneous innovation in audience diversification and audience deepening. This finding clarifies for future potential museum experts that they cannot invest their time in audience diversification since the technology in themselves are limited.

Therefore, museums did focus on using the connectivity feature to increase audience diversification in tandem to deepen their relationship with the younger generation. This finding suggests that contradictory to Bakshi and Throsby (2009) research which defines the concept of audience reach in three different forms of innovation, these forms of innovation can overlap. The connectivity feature can attract new groups of consumers while intensifying current participants' level of involvement.

In a museum experience being a part of a good market, providing consumers the necessary information is very difficult. Interactive characteristics compared to connectivity features are extremely successful tactics providing a variety of attributes to the museum experience to ensure the visitor gains utility and, thus, increasing audience diversification. The interactive characteristic actively implicates the museum visitor and its participatory strategies push the museum visitor to create their own conclusions.

Their success seems to be in line with literature regarding the visitor-centered perspective which concentrates on the visitor's experience rather than the artifacts (White & Ch'ng, 2019). Although the museum expert's visitor centered approach needs to be fine-tuned, they managed to bring in a younger generation. Moreover, the feature of interactivity provides museum experts with multiple opportunities to create new products to attract users. The connectivity features were not as successful due to the museum's lack of resources to create effective signals that satisfy all museum audiences. The museum's lack of resources and knowledge of effective signals could be detrimental to the trust the receiver has in the museum. This trust is essential to sustain due to the high credence attributes and, therefore, information asymmetry experienced by the museum's targeted audience. Essentially, interactive characteristics are rather easy to install while connectivity characteristics can easily hinder the diversification of audiences while still reaching the audience members they already have.

The research provided the antecedence of Bakshi and Throsby's conceptual model. In doing so, the research found information problems which could occur if museum experts did not shape the information correctly. In shedding light on the information problems, the research was able to formulate advice for museum experts to innovate in audience diversification. This advice can benefit the museum experts since audience diversification offers other avenues of revenue for the museum.
However, there are few points to discuss in terms of limitation:

- First, the research only interviewed museum experts and not the visitors. In having the perspective of museum experts and visitors, the research obtains the whole picture in the efficacy of the ICT features to innovate in audience diversification. Additionally, the research would benefit from studying other museums across Europe. The greater the sample, the stronger the results would be. However, the study experienced time limitation and a difficulty in gaining the attention of other museum experts.
- With that, there is a limitation in the sampling of the research. The research would benefit from an equal amount of museum experts from a larger and smaller museum. Controlling the variable of size could weave out the potential political and bureaucratic obstacles that museum experts faced.
- Moreover, in terms of Artivive, the research would benefit from interviewing the marketing manager of Belvedere. This would enable the research to gain data on their perspective of Artivive's work.
- An exact number of marketing managers, communication managers and curators could help to gain a clearer picture of how these features benefit the museum experience as a whole.

- Most importantly, the study could analyze the features of interactivity and connectivity together. The digital era extended the museum's scale and scope (Camarero & Garrido, 2012). However, the scope of the museum experience is not fully captured in this research because a lot of products have both interactive and connectivity features.

In general, the research offers a picture of how these features increase audience diversification in museums found in Belgium, Austria and France. Future research is essential on this topic. For instance, the research would benefit from quantitative research to obtain a larger sample which makes the data would be more accurately generalisable. Quantitative research could also research the impact of size on the museum's ability to innovate. The research already insinuates that size could have had a big repercussion on the museum's ability to innovate. In focusing on the connectivity and interactive features in relation to size, new insight could be had. This would be essential since museums are in dire need for financial help and if they are able to accurately and successfully utilize interactive and social media tools, they would substantially gain from it.

Appendix

Appendix (a): interview guide

Dear Interviewee,

This is a synthesis of my research so that you understand what the interview is about.

In recent years, museums have recognized the need to adapt to changing market dynamics. One way museums have done so, is by innovating in audience diversification. In other words, museums are working on attracting and extending their appeal to audiences which would have otherwise not visited. At their own pace, museums are leveraging technology to enhance their engagement with audiences. Therefore, the purpose of this paper is to first understand if museums are attracting a diverse set of audience and how museums might or might not utilize digital innovation to do so. Through the interview, I will also understand if there are any factors and contingencies which hinder museums from benefiting from digital innovation opportunities.

The interview will last a minimum 45 minutes but I am flexible to accommodate your schedule. The interview is split in 4 parts which I have named, background information, museum and audience diversification, interactivity and connectivity . I will tell you each time we are starting a new section of the interview for you to have an understanding where we are at in the interview. I would like to remind you that you are of course welcome to opt out of the interview at anytime and that all information regarding this data is shared between me and my supervisor.

General information

1. Could you tell me about what you do at the museum
    a. Name
    b. The museum name
    c. Do you know how many people visit the museum
    d. Do you know how many people have participated in your project
    e. Can you tell me about the general public that you work with?
    f. What is the mission of the museums?

Audience Diversification

1. Is your museum working on attracting different audiences?

2. What specific strategies or initiatives has your museum implemented to attract a more diverse audience?
3. How does your museum identify and understand the needs and interests of different demographic groups when planning its audience diversification efforts?
4. Are there any outreach programs or initiatives aimed at specific demographic groups to increase their representation in the museum's audience?
    a. Can you tell me about them?
    b. Why do you address this target group?
    c. What aspects of the program attracted the target group?
    d. Did the target group's expectations of the museum experience change before and after the experience?
5. What have been the obstacles and challenges in implementing digital technology to diversify the audience?
    a. Do you have any concerns about the implementation of digital technology in museums?

Interactive

1. What does an interactive experience mean to you in museum contexts?

2) Have you thought about using interactive experiences?
    a. Can the interactive experience only be used on site?
3) In your opinion, how does the interactive experience contribute to enriching the visitor's experience of the museum?

If Yes

1. How has the use of interactive technology influenced the museum's ability to attract and engage different demographic groups?
    a. Has the use of interactive technology deterred demographic groups?
    2. Can you explain about a case study of an interactive experience

a. How does the museum encourage visitors to use interactive technologies?

b. Do the steps involved in inviting users to use the interactive technology differ in terms of demographics?

c. Through time, did the museum have to improve upon the interactive projects

3. What are the steps involved in creating a successful interactive experience?
    a. To what extent should museums use interactive technology?
5. In your own words, how would you measure its success?
6. How do you ensure that the use of digital technology in marketing does not overshadow the museum's physical exhibits and experiences?

If No

1. If your museum did not use interactive technology, why not?
2. To what extent should museums use interactive technology?
3. What concerns do you have about implementing interactive technologies in the museum experience?

Connectivity

1. Have you thought about using platforms that connect visitors to museums?
2. Have you considered using platforms that connect visitors with museum educators?
3. How do you think the experience of connecting people contributes to enriching the visitor's experience of the museum?
    a. Are there experiencing which connect people that you feel limits the quality of the museum experience?

If Yes

1. What platforms do you primarily focus on for social media engagement?
    a. Why do you use these platforms?
2. What strategies or content have you found most effective in reaching different demographics through social media?
3. What role does user-generated content play in your social media strategy to engage diverse audiences and encourage participation?
    a. What kind of collaboration is possible with visitors?
    b. How do you feel about the visitor's voice contributing to the museum experience?
    c. To what extent should a museum use social media?
4. In your own words, how do you measure successful use of social media platforms?
5. How do you ensure that the use of social networks in marketing doesn't overshadow the museum's exhibitions and physical experiences?

If No

1. If your museum does not use technology that connects visitors to the museum, why is this not the case?
2. Are there any platforms you wouldn't want to use?
3. What concerns do you have about implementing social media in the museum experience?

Appendix (b)

B. 1 Interviewee Guide

Interviewee	Where	Museum	Profession	Concept	Notes related to interview	Where the interview was conducted	Limitation	Additional Facts about museum

Ykje	Antwerp, Belgium	Antwerp	Data manager	Interactivity	Works in the backend	Online on Microsoft teams	Interview conducted 6months ago. There was uncertainty in what she actually did	Museum with largest fashion collection
Viviana	Paris, France	Centre des Monuments Nationaux (arc de triomphe)	Head of Public Engagement and Programmes at the Arc de Triomphe (Paris, France)	Interactivity	Had one year on the job	Online on Google teams	Interview conducted online. Sound issues at the start	1.7million visitors a year go to the museum
Christophe	Brussels, Belgium	Bozar Musee	Marketing communication, officer	Connectivity	A few months on the job	Online on Microsoft teams	Interview conducted 6months ago	1.3million a year
Alix	Brussels, Belgium	Art&Marges	Public manager	Interactivity	Worked with Art and Public	At the museum	Interviewee got distracted by her subordinate	Alternative museum
Sarah	Brussels, Belgium	Art & Marges	Communication manager	Connectivity	None	At the Museum	Interviewee was a bit stressed	Alternative museum
Zustrassen	Brussels, Belgium	Musee Horta	Curator	Connectivity and Interactivity	None	At the museum	None	Extremely popular museum
Marine	Brussels, Belgium	Art and Public	Public manager	Interactivity	None	Online	interview conducted 6months ago.	
Sergiu	Vienna, Austria	Artivive	CEO	Interactivity	None	Online	None	1million + downloads of app
Anne	Vienna, Austria	Projectspace	Curator	Connectivity	None	Online	interview conducted 6months ago.	
ekaterina	Brussels, Belgium	Bozar Muse	Public manager	Interactivity	none	online	interview conducted 6months ago.	

B.2 Technology Guide

technology	feature	interviewee
Program: Next Generation! Creating their own camera and developing their own photos, movie	Interactivity	Public engagement manager of Bozar
Social media: instagram & youtube	connectivity	Communication manager of Art & Marges

Program: Video game		interactivity		Public engagement manager of Art & Marges
Program: Video game		interactivity		Project manager of Art & Public
Augmented reality museum app		connectivity	interactivity	CEO of Artivive
Social media: instagram & youtube		connectivity		Curator of Projectspace
Social media: instagram & youtube		Connectivity		Marketing manager of Bozar
Online database		interactivity		Advisor data management at MoMu
Social media: instagram & youtube	Museum app	connectivity	interactivity	Public engagement of Arc the Triomphe
Social media: instagram & youtube	3D museum visit	connectivity	interactivity	Curator of the Musee Horta

Appendix (c):

Classification of Museum Types

	aim	Subcategory of museum	display
Art museum	Present works of art and preserve them	Art museums	Fine arts, applied art
		Permanent art gallery	
		Museum of architecture	
		Museum of sculpture	
		Picture galleries	
Archeology and history museums	Present the historical evolution with objects found from excavations	Museums with collections of historical objects	collections of historical objects or remains
		Antiques museums	

		Archive museums	
		Military museums	
		Museums on historical figures	
		Archeological museum	
science museums	Dealing with the subject of biology, geology, botany, zoology, paleontology and ecology	Natural history and natural science museum	Dealing with the subject of biology, geology, botany, zoology, paleontology and ecology
	Dealing with the sbject of astronomy, mathematics, physics, chemistry, medical science, construction and building industries	Science and technology museums ● Planetaria ● Science centers	Manufactured objects
	Dealing with subjects of society	Ethnography and anthropology museum	Displaying materials of culturel, social structure, beliefs, customs, traditional arts
Other Museums	Dealing with a singular theme	Specialized museum	Display a single theme which was not convred in previous categories
	Dealing with subjects on a region or territory	Regional museums	Display a more or less extensive region constituting a historical and cultural entity
	Dealing with subjects not covered by others	General museums	Display a mixed collections and cannot be identified by a predominant field

Note: adapted from *A Guide to Museum Statistics in Europe*, European Group on Museum Statistics [EGMUS], n.d., p.141-142.

Appendix (D)

definitions of new technology and an overview of their impact on the museum experience

Digital innovation (DI)	Their definition	The driver of innovation studied in relation to the study	Their impact on the museum experience	Characteristics of the museum experience mediated through interactivity and connectivity
Smartphone	museum apps are understood as mobile apps downloaded for free on the user's own personal network-enabled mobile devices(smartphones, tablets, e-readers, etc). They should be developed for the museum in question by an external ICT company or the museum itself (Economou & Meintani, 2011)	• Connectivity • Interactivity	Media-driven off-site and on-site experience	• The visitor can actively personalise the information at hand. For example, choose the language. • Can have sound and video incorporated • Wireless communication • Interactive experience because they receive information(independently or on their own) as they wander around (Economou & Meintani, 2011)

Interactive exhibit/program	Museum collaboration with the visitor on an activity which is on-site to enhance creative output and creative consumption (Shedroff, 2002)	• interactivity	media -enhanced on-site experience	Interactive exhibits promote participatory-learning experiences. They are designed to supplement traditional didactic content presentation. They do so by actively engaging the visitor to create their own meaning of the exhibition. These interactive exhibits play a supporting role. (Simon, 2010)
Social media	Online platforms such as facebook, twitter and Instagram where users can directly interact with other users of the museum and exchange ideas (Bakhshi& Throsby 2009),	• Connectivity	Media-enhance off-site and on-site experience	Social media provides a shift in the museum communication model. Now, users can participate in the museum experience by sharing their thoughts with other users and the museum experts. (Drotner&Schroder,2019)

Table: The definitions and characteristics of the digital innovation studied are based and adapted off of Bakhshi& Throsby (2009), Drotner & Schroder(2019), Simon(2010).

Appendix (E)

Different interview section names	**Question**	**concept**

General information	1. **Could you tell me about what you do at the museum**
	    1. **Name**
	    2. **The museum name**
	    3. **Do you know how many people visit the museum**
	    4. **Do you know how many people have participated in your project**
	    5. **Can you tell me about the general public that you work with?**
	    6. **What is the mission of the museum**
		museum

Audience diversification	**Is your museum working on attracting different audiences?** **What specific strategies or initiatives has your museum implemented to attract a more diverse audience?**	**Target audience**
	How does your museum identify and understand the needs and interests of different demographic groups when planning its audience diversification efforts?	**Consumer's consumption habits**

	Did the target group's expectations of the museum experience change before and after the experience?	**Consumer's needs and interest**
	What have been the obstacles and challenges in implementing digital technology to diversify the audience?	**Museum's financial resources**
	Do you have any concerns about the implementation of digital technology in museums?	**Museum's changing role**
Interactivity	**What does an interactive experience mean to you in museum contexts?**	**Interactive exhibits**
	Do the steps involved in inviting users to use the interactive technology differ in terms of demographics? **Do the steps involved in inviting users to use the interactive technology differ in terms of demographics?**	**Interactivity**
	How has the use of interactive technology influenced the museum's ability to attract and engage different demographic groups? **Has the use of interactive technology deterred demographic groups?**	**Hands-on interactive exhibits**
	Can you explain about a case study of an interactive experience	**Case study**

	How does the museum encourage visitors to use interactive technologies? **Do the steps involved in inviting users to use the interactive technology differ in terms of demographics?**	Participatory strategies
	To what extent should museums use interactive technology?	**Contingencies to interactivity**
	In your own words, how would you measure its success of interactive exhibits **How do you ensure that the use of digital technology in marketing does not overshadow the museum's physical exhibits and experiences?** **Through time, did the museum have to improve upon the interactive projects**	**Critics of interactive exhibitions:** **Disneyfication** **Fetishization of technology** **Illusion of choice**
Connectivity	**Have you thought about using platforms that connect visitors to museums?** **Have you considered using platforms that connect visitors with museum educators?**	**Social media**

	How do you think the experience of connecting people contributes to enriching the visitor's experience of the museum? What platforms do you primarily focus on for social media engagement? Why do you use these platforms?	**Connectivity**
	Are there experiences which connect people that you feel limits the quality of the museum experience?	**Critics of connectivity**
	What strategies or content have you found most effective in reaching different demographics through social media?	**Diversity of goods and services**
	What role does user-generated content play in your social media strategy to engage diverse audiences and encourage participation? a.What kind of collaboration is possible with visitors? b.How do you feel about the visitor's voice contributing to the museum experience?	**Democratisation/ active visitor**

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