A story of immersion:
The design and production process behind the storytelling of immersive museums and art exhibitions

Student Name: Zoi Popoli
Student Number: 540984

Supervisor: Dr. Izabela Derda

Master Media Studies – Media & Creative Industries
Erasmus School of History, Culture and Communication
Erasmus University Rotterdam

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ABSTRACT

Gradually, museums have been reflecting on the kinds of exhibitions they create and consequently, shifting their approaches as far as exhibition design is concerned. Visitors' criticism and demand to move away from passive, encyclopaedic with curatorial authority exhibitions, to ones that engage visitors and place them at the centre of focus has ignited this change in exhibition design. For this reason, museums have begun to experiment with the exhibition design and look for new ways to engage and intrigue visitors. A way to do so is by employing immersive approaches together with strong storytelling which can create memorable experiences and redefine the user experience. However, despite the increased adoption of immersive exhibitions, the design and production process behind such exhibitions has not been investigated in-depth yet, with scholars reporting that the accounts of designers and experts who are not part of the museum team are rarely taken into consideration in studies. Thus the research combined the narratives of interviewed experts and identified a design and production model consisting of five phases (initial, concept, design, production, and opening phase), which extends our understanding of the creative process for immersive exhibitions, while simultaneously denoting changes in contemporary exhibition design in general, due to the wide integration of immersive approaches in nearly all exhibitions.

The research also revealed the changed dynamics of a detailed and expanded two-sided production model which requires the close collaboration of multiple experts. Nonetheless, the proliferation of the roles required in exhibition design and production has been filled by external collaborators, and the museum team has not expanded to include all those new roles. Finally, the creative process is not technology-driven since the development of a leading story lies at the heart of the identified model and informs the overall process. Therefore every exhibition is a story, and immersion is being used as a way to enhance the storytelling and engage and submerge visitors in what they experience.

KEYWORDS: *Immersive exhibitions, Storytelling, Exhibition co-production, Museum exhibitions, Creative process*

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1. Introduction

Traditionally, exhibitions employed an encyclopaedic approach with curatorial authority and material objects, in order to achieve their educational purposes and assist visitors' learning experience (Muller & Edmonds, 2006; Wang & Lei, 2016). However, the means of knowledge transmission have changed and with them the design and production practices behind museums and art exhibitions. Technology-driven design and multi-sensory approaches can create innovative ways of knowledge and information transmission through experiences (Dal Facco & Vassos, 2017). Thus, museums and galleries are becoming hybrid places where the virtual and digital aspects of stories are combined with the physical artefacts (Irace & Ciagà, 2013) and consumers are not passive onlookers anymore. Instead, they actively co-create and co-produce aspects of the exhibitions by interacting with their environment (Barnes & McPherson, 2019; Muller & Edmonds, 2006).

1.1 Research problem and research question

Before delving deeper into the topic, I should explain that the terms 'museums' and 'galleries' have often been used interchangeably to describe similar cultural institutions (Robins, 2016). For this reason, I will use the term museum to refer to museums of artefacts, natural history, local history, art museums, etc., and galleries that house works of arts, either as part of a museum or independently (Robins, 2016).

Museums can be quite diverse and have various objectives depending on the exhibitions that they house. For instance, a museum of natural history has different set of goals and produces different exhibitions from an art museum. Thus, to understand their core mission, it is useful to look at the definition of museums as it is drafted by the International Council of Museums' (ICOM). More specifically, in 1961 ICOM defined the museum as "any permanent institution which conserves and displays, for the purpose of study, education and enjoyment, collections of objects of cultural and scientific significance" (ICOM, 1961, art.3 para.1). The definition was broadened by 1974 to acknowledge the societal role of museums and their obligations to their audiences. Finally, the definition that remains intact to this day and which describes the overarching role of museums is the following:

> A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment. (ICOM, 2007, art.3 para.1)

Historically, museums were defined by their role as institutions of knowledge and cultural heritage (Lake-Hammond & Waite, 2010), as it also becomes apparent from the definition of their

role. The objects on display and the available space determined the layout of each exhibition, with exhibition design being used solely as a mean to please the curator and content expert (Lake-Hammond & Waite, 2010). However, the influence of audience expectations has challenged the approach of passive static object display to evolve into audience-centred exhibitions (Barnes & McPherson, 2019; Dal Facco & Vassos, 2017; Lake-Hammond & Waite, 2010; Muller & Edmonds, 2006; Mygind, Hällman, & Bentsen, 2015). Consequently, museums are adapting to these new demands in order to remain relevant and attract diverse visitors (Giannini & Bowen, 2019). Glenn Lowry, Director of the Museum of Modern Art in New York City, reclaimed at the meeting of Art Leaders Network in 2018:

> The real issue for all of us in the museum world is to learn to think digitally so that what we are talking about is not simply the transformation of certain kinds of stories into different formats or the use of new technologies to deliver those stories, but fundamentally rethink how we think, to move away from the kind of analogue art history that we were all taught, hierarchical, sequential, to a more networked reconsidered manner of actually presenting works of art. (Giannini & Bowen, 2019, p.204)

His statement summarizes the need for museums to shift their focus not towards technology which is only a 'tool' for exhibition design, but towards reflecting on the kind of exhibitions created (Giannini & Bowen, 2019). Nevertheless, the debate around the advantages and disadvantages of different exhibition approaches is an ongoing one (Dean, 2015). However, it has been argued that storytelling attributes can offer a unique aesthetic spectatorship and aide museums in their new role (Dal Facco & Vassos, 2017; Nielsen, 2017), while immersive approaches can create a multisensory and engaging experience (Bartlem, 2005).

The storytelling of immersive exhibitions is different than the exhibition of tangible objects curated for structured exploration. Accordingly, a change in design and production practices usually requires different creative talent to bring them to life and changes the traditional process' shape and dynamics. Increasingly, exhibition design is seen as a collaborative process, bringing creative individuals from different disciplines and backgrounds together (Dal Facco & Vassos, 2017; Holmlid, 2009; Vavoula & Mason, 2017). Macdonald (2007) argued that the point of view of designers and experts, who are not part of the museum team, is rarely incorporated into studies, thus neglecting crucial information around the process of exhibition design. But the co-production practices are only one aspect of exhibition design. As McCall and Gray (2014) report, changes in exhibition design practices have received acknowledgement but not the expected analysis to determine whether the shift from 'old' to 'new' museum experiences is actually the product of a different process. Put differently, no previous research has attempted to identify the process behind the design and production of immersive, multi-sensory and multi-media exhibitions or explore the relationship

between storytelling and immersion. Therefore, this study aims to fill the gap and provide insights into the design and production process behind the storytelling of immersive exhibitions. In other words, the research sought to answer:

What is the design and production process behind the storytelling of immersive exhibitions?

In order to understand the changes in the exhibition design process, interviews with industry experts, ranging from museum professionals, to design agencies and independent designers, who are involved in such processes, were conducted. The different views of stakeholders representing their part in the design and production of exhibitions helped create a well-rounded overview of the whole process. However, the design and production process is a creative one (Ames, Franco, & Frye, 1997) and as such cannot easily be formalized into a well-defined sequence of tasks (Davies, 2010; Macdonald, 2007). Consequently, this research attempted to identify the process behind the creation of immersive narrative experiences curated for art galleries and museums and conceptualize it into a structured model but not a rigorous sequence of tasks, hence acknowledging its flexibility.

1.2 Academic and social relevance

Exhibitions have been criticized by visitors for their sole observation rules, something that affects their efficiency in knowledge transmission while making visitors' experiences inferior (Dal Facco & Vassos, 2017). Technology, however, emerges as a tool to make art relevant again, while simultaneously renewing the museum experience (Olesen, Holdgaard, & Laursen, 2018) and contributing to the 'new museology' paradigm in contrast to the classic collections-centred museum exhibitions (Desvallées & Mairesse, 2010). These new technology-backed narrative experiences (Dal Facco & Vassos, 2017) take advantage of visual and audio materials such as images, objects, sound, music and high-tech hardware like holograms or touch screens (Wang & Lei, 2016). Digital integration can be a lengthy and challenging task (Olesen, Holdgaard, & Laursen, 2018), and one that as is not well-documented (McCall and Gray, 2014). The design of the exhibition, therefore, implies a change in the design and production process but the empirical evidence to sustain and explore this claim are not adequate.

This study also relates to current discussions of the changing role and identity of museums as it is embodied by the exhibition design, which fuses rigorousness with entertainment to enhance interactivity, play, and participation (Olesen, Holdgaard, & Laursen, 2018; Wang & Lei, 2016). As Marshall McLuhan has claimed, "we are swiftly moving at present from an era when business was our culture into an era when culture will be our business" (McLuhan, 2011, p. 384). Simultaneously, exhibition design interconnects the understanding of our past, the need to generate new knowledge, and inspiring ways to imagine our future; integral elements in our information-

saturated world (Lake-Hammond & Waite, 2010). In other words, museological practise is trying to keep up with the demands of the digital technology era that we are living, where the experience is valued more than anything, not without criticism though (Barnes & McPherson, 2019). Nonetheless, when curators take advantage of the new means available in exhibition design which enhance interactivity, convey meaning, and tell stories, they will be able to create exhibitions with greater impact in society (Giannini & Bowen, 2019).

Moreover, cultural industries are characterized by the tension between artistic production and marketplace business dynamics (Gotsi, Andriopoulos, Lewis, & Ingram, 2010). This is quite challenging since cultural industries' products evoke private experiences that are neither utilitarian nor commercial but are embedded in an economic context where professionals are also expected to be innovative with the given resources (Gotsi et al., 2010; Lampel, Lant, & Shamise, 2000). Simultaneously, they deal with risk, dynamism, and uncertainty, which questions established practices (Lampel, Lant, & Shamise, 2000). However, the changes and dilemmas that the cultural industries are facing resemble a lot of other industries where knowledge and creativity are intertwined (Lampel, Lant, & Shamise, 2000). Therefore, the present research can act as a valuable source of information for professionals who work in the cultural industries and predominantly museum or art institutions, but also for other professionals beyond the cultural industries.

Overall, this research confined itself to primarily identifying the functions associated with creating an immersive exhibition. Therefore, the contribution this study offers is threefold: (1) it expands existing knowledge on exhibition design by determining the process behind the creation of the storytelling of immersive exhibitions; (2) combines diverse narratives of experts from different sides of the creative process to generate a well-informed perspective into the subject; (3) offers industry practitioners a more in-depth look at the exhibition creative process.

1.3 Chapter outline

For the remaining paper, following the *Introduction* chapter, there is the *Theoretical Framework* chapter, *Method* section, *Results*, *Discussion* and lastly the *Conclusion* chapter. The *Theoretical Framework* chapter is divided into three sections; first, the shift in exhibition design is explored, followed by the review of the concepts of storytelling and immersion, and lastly, existing literature around design and production practices is used to elaborate on the process, while topics of collaboration and roles within a creative team are also addressed. The *Method* section is dedicated to the research design, which is semi-structured expert interviews for data collection and thematic analysis for data examination. Additionally, the sampling criteria, data collection together with operationalization and the credibility of the research are acknowledged. Then, the *Results* chapter presents the results of the data analysis and explores all aspects of the identified design

and production model in detail, together with examples from the conducted interviews. The *Discussion* chapter provides an interpretation of the findings in relation to existing literature in order to provide valid answers to the research question. Finally, the *Conclusion* provides an answer to the research question, which was proposed here, describes implications and limitations of the study, and makes suggestions for areas of further research.

2. Theoretical Framework

The following chapter reviews museums' and art exhibitions' design approaches and explores aspects of modern exhibition design. The first sub-section is dedicated to exploring the shift in exhibition design as documented from previous studies. Then, special attention is given to the concept of immersion and storytelling, and their role in shifting the design approach away from a collection-centred one. The last part of this section reviews previous studies of design and production processes, the necessity of interdisciplinary collaboration, and finally the changing roles within a museum team.

2.1 Changes in exhibition design

Factors that influenced and propelled changes in exhibition development have to be addressed before examining the creative process behind the storytelling of immersive exhibitions. Notably, the change of focus from the displayed objects to visitors' experience is at the centre of this assumed shift in practice. For this reason, new approaches in exhibition design are presented along with a short discussion of the role of organizational identity in the reception of those new procedures. Lastly, criticism regarding immersive and interactive exhibitions and the debate around the changing role of cultural institutions is analyzed in more detail.

2.1.1 Exploring the change

The exhibition lies at the heart of every museum's or art institution's visit and experience. Thus, to understand the assumed shift in practice, it is useful to first address the rise of technologically enhanced design in the creation of immersive exhibitions. It has been reported that the twentieth century with the development of modern technology has facilitated the change in scope of exhibition design (Wang & Lei, 2016). Lorentz (2006) however, through her concise historical review ranging with examples from cave paintings, the introduction of a narrative experience in the form of theatre in ancient Greece, to Baroque architects, sets out to prove how immersive experiences have always been a part of human life leading to our contemporary understanding of what the term entails. Consequently, Lorentz (2006) supported that the technological and socio-cultural developments have provided the incentive and opportunities to exploit new knowledge in the creation of immersive experiences. Therefore, the design of experiences varies depending on the available and employed means, but all have three things in common; they challenge the participants, their perception, and are multi-sensory (Lorentz, 2006).

The ever-evolving technological means of designing an exhibition is not the predominant reason for the assumed shift in practice. More importantly, the key reason is that culture and art spaces have been criticized by visitors for their rigorous behavioural rules of sole observation,

something that makes the visit less pleasant and informative (Dal Facco & Vassos, 2017). Accordingly, a change has been marked in contemporary art and culture demand away from material objects and curatorial authority, and toward creating an experience for visitors (Barnes & McPherson, 2019; Muller & Edmonds, 2006). This sentiment is echoed in Mygind, Hällman, and Bentsen's (2015) review of exhibition development, where museum visits are characterized as impersonal, exclusive and non-inspirational, whereas the need for designing exhibitions that match visitors' wants and needs is highlighted.

It has been proven that museum visitors expect comprehensive narratives that combine "rigorousness and imagination, seriousness and entertainment" (Wang & Lei, 2016, p. 346). Mygind, Hällman, and Bentsen (2015) underlined that visitors feel supported in their personal meaning-making process when their visit to the museum requires their active involvement. This would also make their visit more relevant, interesting, accessible, and pleasant (Dal Facco & Vassos, 2017; Mygind, Hällman, & Bentsen, 2015). Consequently, for museums to enable rich interaction with their audiences, the focus needs to be less on the object on display and more on communicating with visitors and creating a meaningful experience for them (Dal Facco & Vassos, 2017; Lake-Hammond & Waite, 2010).

In consequence, museums are moving from a collection to visitor-centred approaches, acknowledging and utilizing the all-encompassing digitization of the culture and the rapidly growing demand for a user-centred experience (Tallon& Walker, 2008). Lack of the relevant reaction may put cultural institutions at risk of losing their resonance with their audiences and ability to keep up with contemporary life (Giannini & Bowen, 2019). Similarly, Muller and Edmonds (2006) conclude that the change in making and curating art is directly affecting cultural institutions' relevancy.

2.1.2 New approaches in exhibition design

Having established what brought along this change in exhibition design, it is important to turn to how museums attempt to create an experience that caters to their visitors' needs through their approaches to exhibition design. For this purpose, the two most prominent and common approaches are discussed in the following paragraphs.

Wang and Lei's (2016) distinction between the eyes-on, hands-on and minds-on exhibition, marks the gradual shift of power between the visitors, who started to take an active role of 'discovering' the exhibitions and the institutions, which used to design a structured discovery path for their audiences. In their study, Wang and Lei (2016) defined the 'eyes-on' as the traditional encyclopaedic exhibition with a perceived distance between visitors and artefacts. The 'hands-on' was deemed as a more innovative and interactive exhibition approach (Wang & Lei, 2016). However, as they further argued, the traditional 'eyes-on' and more interactive 'hands-on'

exhibitions are essentially not that different from each other, since they are quite restrictive and do not allow visitors for exhibits self-interpretation (Wang & Lei, 2016). As a result, the approach of the 'minds-on' exhibition is seen as an answer to the calls from visitors for increased flexibility and freedom to appreciate the artefacts (Wang & Lei, 2016). A 'minds-on' exhibition creates an environment where visitors have the authority to discover artefacts through their senses and a plethora of media (Wang & Lei, 2016). This approach aims to create a narrative that balances between knowledge transmission and imagination stimulation (Wang & Lei, 2016). Moreover, to interpret and shape this narrative, visitors can use more than one sense provided that the museum curators have created an environment of synaesthesia (Wang & Lei, 2016). In other words, while the aim of the exhibition remains the same, the means to achieve it have evolved.

Looking at another approach, Dal Falco and Vassos (2017) reported how new forms of technology-backed exhibitions are transforming museums into hybrid places where the digital narrative is entwined with artefacts, and visitors are actively interpreting and co-creating what they see. Notably, designing exhibitions that merge physical with digital aspects have to find a balance between historical accuracy of content and creation of a narrative that constitutes a cognitive map without limiting or alienating visitors (Lake-Hammond & Waite, 2010; Vavoula & Mason, 2017). Similarly, Barnes and McPherson (2019) reinforced the notion of museums as hybrid spaces where visitors co-produce and engage with content in numerous ways thanks to digital technology. With the term 'hybrid space', they define the combination of the physical with the online space to create a multidisciplinary one (Barnes & McPherson, 2019). This approach has also been described using the term edutainment. Buckingham and Scanlon (2000) defined edutainment as a hybrid genre which combines visual materials, narratives, and game-like formats under a single less formal didactic approach. The focus though, transitions from the object on display to the creation of an engaging visitor experience (Barnes & McPherson, 2019).

To summarize, the new approach in exhibition design is twofold. On the one hand, visitors engage with objects, sounds, images, or multimedia and multisensorial installations in museum spaces, which aim to offer a variety of ways for audiences to interact and engage with content (Allain & Harvie, 2014; Barnes & McPherson, 2019; Wang & Lei, 2016). On the other hand, exhibition design has to balance between accuracy and offering an engaging experience to non-expert visitors (Vavoula & Mason, 2017).

2.1.3 Limitations for the new design approach

This shift in museum practice and exhibition design has not been welcomed with widespread acceptance. McCall and Gray (2014) explored the transition from an 'old 'to a 'new museology' which refers to the changing role of museums and their new communication styles.

Despite the expected shift towards new functions and roles within a museum given the evolution of approaches due to the 'new museology', they argued that in reality the situation is far more polarized between old and new museology practices (McCall & Gray, 2014). This is due to structural constraints and defensive or reluctant behaviours from individuals who hinder the adoption of new approaches (McCall & Gray, 2014). Consequently, they called for further research to examine issues of organizational change in light of their findings, as have other scholars (Janes, 2007; Peacock, 2008).

It has been suggested that one lens for studying phenomena like organizational change is identity since it influences many other organizational concepts (Gioia, Patvardhan, Hamilton and Corley, 2013). Building on the subject, actors shape, ignite or even halter organizational change given that any process of change is intertwined with their own personal beliefs and habits of action (Tsoukas & Chia, 2002). To exemplify this, Pettigrew (1997) stressed that actors are simultaneously producers and products, denoting the complex web that weaves together actions, contexts, agents, and ultimately processes. Thereupon, the notion of 'new museology' is not accepted and implemented as easily and effortlessly as one might expect, and the role of individual actors should not be underestimated.

Nevertheless, the object of this research is not centred on exploring the topic of organizational change and identity or how individuals respond to change. Hence the above-mentioned discussion serves mostly as useful context to understand the move towards immersive exhibitions and acknowledging how the broader environment of a cultural institution influences the adoption of fundamentally different practices, which in turn impact exhibition design.

2.1.4 Criticism and support for the new design approach

Traditionally, the mission of every cultural institution has been a transmission of knowledge through the study and exhibition of objects and work (Dal Falco & Vassos, 2017). However, it becomes apparent that the role of museums has evolved to combine knowledge and artefacts with the experience economics (Balanzategui & Ndalianis, 2018; Dal Falco & Vassos, 2017). Therefore, museums have faced criticism regarding the potential loss of their educational role in the quest to become more relevant and attractive (Barnes & McPherson, 2019; Black 2012; Gray 2016; Kershaw et al., 2018a, b).

Delving further into the subject, Balanzategui and Ndalianis (2018) note the tendency of museums to borrow elements and techniques from popular entertainment in order to engage their visitors. However, the new practices in exhibition design are the subject of controversy since they have been compared to theme park-esque design in an effort to develop immersive 'narrative environments' (Balanzategui & Ndalianis, 2018).

Moreover, this multi-dimensional approach alters exhibition design focus towards combining education with entertainment (Barnes & McPherson, 2019; Black, 2009). Okan (2003) reported on the danger of equating education with fun when education is incorporating technology. She further justified her opinion by explaining how edutainment means that learning has to be fun, otherwise people are not enjoying themselves and hence not learning (Okan, 2003). Thus, in the end, edutainment can be perceived as an approach that does not facilitate education and learning after all; it trivializes it (Bloom & Hanych, 2002).

On the contrary, the response of advocates of the new design approaches can be summarized in the statement of Bruno Monnier, president of Culturespaces, a company which manages museums and cultural heritage sites, and is responsible for the creation of the 'digital art centres' Atelier des Lumières, Carrières de Lumières and now Bassins de Lumières, about the future of exhibitions: "passive observation of works of art is no longer relevant" (Brown, 2018, para. 6). In addition, Michael Couzigou, who is the director of the Atelier, pointed out:

> This is an entirely different type of experience from what you would get in a museum (…). It provokes a strong emotional response. As such, the Atelier has great potential as an educational space. Our priority is to open culture to everyone, and digital art allows this. (Warde-Aldam, 2018, para. 12)

Academics have also supported their arguments. As it is evident from Giannini's and Bowen's (2019) study, digital intermediaries are used as a mean to facilitate the desired engagement and co-creation with visitors, without decreasing the importance of artists and their work (Giannini & Bowen, 2019). Moreover, to keep with the educational role of museums, the new approaches in exhibition design are looking for engaging and appropriate ways to 'talk' to visitors towards the aim of creating a positive learning environment (Wang & Lei, 2016). This means that technological and multisensorial means are only employed as a way to deepen audiences' experiences and learning, and create an immersive space which ultimately is more entrancing and effective in transmitting knowledge (Wang & Lei, 2016). Undoubtedly, this crossing of different disciplines questions the relationship and balance between art, information, technology, and visitors (Bowen & Giannini, 2014), but this should not presuppose that the new practices of exhibition design are of lesser value solely on the premise that user experience has been redefined.

An additional argument in favour of the changing approaches is the fact that museums and galleries that do experiment with more engaging exhibition design, report an increase in their visitors as well as in the diversity of their audience base (Barnes & McPherson, 2019). Similarly, Giannini and Bowen (2019) explain that the changing practices in exhibitions will benefit museums and aid them in growing their community, both locally and globally. This community is reportedly more engaged and culturally distinct due to the fusing of digital, visual, and physical reality

(Giannini & Bowen, 2019). In any other case, they are at risk of being isolated from the digital ecosystem and falling behind (Giannini & Bowen, 2019). Ultimately, cultural institutions want visitors to enter the museum or art gallery ready to be challenged, inspired, and pleasantly surprised in a general spirit of excitement and anticipation (Giannini & Bowen, 2016); the new directions in exhibition design helps them achieve just that.

2.2 Defining storytelling and immersion

The following section is devoted to the definition of the two main concepts, the storytelling and imerssiveness of an exhibition.

2.2.1 Storytelling and narration of exhibitions

Stories have always been an integral part of our lives (Glassner, 2017), and storytelling is defined as an effort to communicate experiences or knowledge using words, images, and sounds (Haigh & Hardy, 2011). A story, irrespective of its form, is essentially a narrative that creates engagement, illustrates information whilst being more memorable, and most importantly evokes feelings (Lugmayr et al., 2017; Nielsen, 2017); factors that are all part of an exhibition's objective. This narrative can draw from different elements depending on its purpose, but (in short), it can be based on emotional, educational, interactive, fictive or non-fictive, digital or non-digital, subjective or objective engagements (Nielsen, 2017). What distinguishes storytelling as a narrative form though, is its ability to trigger our curiosity and emphasize meaning, while evoking feelings and creating memories as noted beforehand (Lugmayr et al., 2017; Nielsen, 2017).

Thus, the value of storytelling can be summarized in Gabriel's (2000, p. 17) statement "If modernism questioned the survival of stories, postmodernism sees stories everywhere". His statement is further justified by the notion that when our minds become emotionally absorbed and engaged, then we let our intellectual guard down and are less sceptical (Nielsen, 2017). In other words, people think narratively more than argumentatively (Woodside, Sood, & Miller, 2008). For this reason, storytelling has been used beyond the sphere of fiction as a tool in interactive activities or even in organizational management in the creation of creative strategies and enabling leadership's goals for instance (Nielsen, 2017). Lugmayr et al. (2017) have attributed the new potential for storytelling to move beyond entertainment and fiction and towards more serious and non-entertainment scenarios, to the digitization of media.

Consequently, it should come as no surprise that the storytelling framework has become an integral part of postmodern museum exhibition approaches (Nielsen, 2014). This is further highlighted by Gabriel's account of how "stories and experience are linked in postmodern discourses like Siamese twins – not only do stories transform into experience, but experience turns into stories" (2000, p. 18). Nielsen (2017) complemented his argument by underlining the

importance for museums to include visitors in their stories either when they take in exhibits or when interacting and communicating with them. This requires mainly creativity on behalf of the museum and a rather good understanding of the way visitors interpret artefacts to be able to make better cognitive decisions (Nielsen, 2017). Similarly, Lugmayr et al. (2017) supported that when audiences are interacting with a narrative, they become engaged, which in turn makes them interpret the narrative as an emotional experience.

Another integral benefit for museums that employ storytelling in their exhibition design is facilitating the meaning-making process (Lake-Hammond & Waite, 2010). This means that the framework of artefacts can be enhanced and be made more consistent throughout an exhibition, to assist the learning experience of visitors (Lake-Hammond & Waite, 2010). Lake-Hammond and Waite (2010) also justified how storytelling can make an exhibition more memorable, which is achieved when the narrative is strong, easy to follow and comprehensive. Mayrand explained that the exhibition designer's job is to "reveal – not conceal – the content, to enhance and not to overwhelm it, to create a stage for its performance" (2002, p. 405). In response to that, storytelling can transform an exhibition into a memorable experience, while at the same time making it easy to grasp the whole meaning behind it (Lake-Hammond & Waite, 2010; Lugmayr et al., 2017; Nielsen, 2017).

Digital storytelling has similar attributes to oral storytelling but provides even more opportunities for interaction, personalization, and agency (Nielsen, 2017). It has been argued that this non-linear storytelling will aid in moving seamlessly between real and virtual or analogue and digital (Giannini & Bowen, 2019). This is achieved through the combination of imagery, audio, text, animation and interactive attributes for the creation of narrative which is eventually translated into an experience (Nielsen, 2017). Furthermore, as Dal Facco and Vassos (2017) argued, technology can offer possibilities and activities to integrate the museum experience in a narrative one, thus creating a personalized story for visitors before, during and even after their visit. In other words, stories are both interpreted and shaped by audiences' experiences through interaction with them (Nielsen, 2017). Undoubtedly, this new exhibition approach appeals to "digital natives who seek innovative ways to experience art and new art to experience" (Giannini & Bowen, 2019, p. 205). At the same time, cultural institutions can use the live storytelling experience created during each visit to transmit knowledge more innovatively, as Dal Facco and Vassos (2017) remarked.

To summarize, storytelling can create the necessary engagement, while illustrating information in a meaningful manner and evoking feelings (Lugmayr et al., 2017; Nielsen, 2017). Simultaneously, new technological capabilities bring new creative possibilities, hence the development of an exhibition narrative influences exhibition design.

2.2.2 Immersive exhibitions

The term of immersion has been for a long time closely, and almost exclusively, linked to the gaming industry. In game environments, immersion is conceptualized by three levels of involvement in a game: engagement, engrossment and total immersion (Jennett et al., 2008). Hence, Jennett et al. (2008) defined immersion as the ultimate level of involvement or in other words it means losing yourself in the world of the game. Similarly, Carrozzino and Bergamasco defined immersion as "the physical feeling of being in a virtual space" and linked the term with virtual experiences (2010, p. 453).

However, the term cannot be associated solely with gaming, since it has been applied to cases transcending the gaming world, even though there are common attributes. For example, this concept of feeling of losing one's self is present in Gilbert's account of immersive museum exhibitions:

> A multisensory experience that allows visitors to walk into the 'scene' (unlike a glass-fronted diorama). Such exhibits pull visitors out of the passive, one-dimensional museum viewing ritual and transport them to a different time, place or situation where they become active participants in what they encounter. (2002, p.10)

Likewise, Mortensen (2010) described an immersive museum exhibition as one that creates a three-dimensional world by distorting the feeling of time and place, all the while integrating visitors in the experience. Bartlem explained that immersive artworks can create an "intimate and embodied relationship with a virtual and physical architecture" while giving great emphasis on the feeling of being enclosed and embraced by the space, in her comparison of immersive and distributed aesthetics (2005, section Defining Immersion, para. 1). Immersion then describes the feeling of being submerged by a completely different reality, able to grasp, absorb, and engross our attention and perception (Gilbert, 2000).

On the one hand, Stapleton and Hughes (2005) argued that immersion is achieved through mixed reality which blends different approaches to blur the lines between subject, object, and space or even real and virtual content. With the term mixed reality, they included virtual reality, augmented reality, augmented virtuality, and live simulation (Stapleton & Hughes, 2005). Thus, digital culture immerses people in visual environments filled with digital colour, sound and moving images (Giannini & Bowen, 2019). This immersion in a virtual world transforms the museum experience as well as the interactions between visitors and artefacts (Bartlem, 2005; Dal Facco & Vassos, 2017).

On the other hand, Bartlem (2005) noted that the state of immersion is the product of any kind of medium that manages to transport audiences and have the escapism or illusionistic effect, and not predominantly that of digital culture. She continued that for visitors to be immersed is to

be “affected by the environment on perceptual, sensory, psychological and emotional levels” (2005, section Defining Immersion, para. 1). She concluded her argument by justifying how immersive artworks transform art spectatorship from a passive concept to an active and even intimate experience while breaking down the perceived distance between viewers and artefacts (Bartlem, 2005).

Nevertheless, immersion is not the outcome of the evolution of digital technologies or even a new concept for that matter, as researchers have historicized (Bolter & Grusin, 2000; Grau, 2003; Ndalianis, 2004; Stafford & Terpak, 2002). Most importantly, both opinions imply that there is an additional purpose when creating an exhibition which must be taken into consideration in the design process. Ultimately, this formed the premise of the present research.

Techniques to immerse audiences and the goal of complete immersion have always been an ongoing fascination of many artists, curators, and theorists (Bartlem, 2005). Gilbert (2002) investigated the motivations of museum professionals to determine the reasons why museum professional choose to create immersive exhibitions. As Gilbert (2002) explored, the three reasons for creating immersive exhibitions is that they are more attractive and thus competitive as a leisure-time option, more memorable and engaging, and finally more effective in the meaning-making process and communicating content; integral factors for museums’ purposes. In addition, it has been argued that pleasurable experiences that utilize all senses in an attempt to offer an immersive event can create lasting impressions and thus favourable memories (Muthiah & Suja, 2013; Stapleton & Hughes, 2005). These favourable memories are important for the identity building, shaping of perception, and marketing efforts of museums while playing an important role in the word-of-mouth process (Muthiah & Suja, 2013). Although it is not a direct topic of interest for the present study, the aforementioned reasons help understand and justify why immersive exhibition are considered important for museum professionals.

To summarize, storytelling attributes can transform an exhibition narrative to something that visitors want to retell (Nielsen, 2017) and possibly even relive. For museum exhibitions specifically, when attempting to combine the physical with the digital aspects, it is important to maintain visitor’s engagement, whilst having the required level of historical accuracy (Vavoula & Mason, 2017). This balance is an integral characteristic of contemporary exhibition design, as it becomes apparent from the previous analysis. Thus, nowadays museum exhibitions in specific are tasked with a mission beyond knowledge transmission; that of the combination of artefacts with experience economics (Dal Facco & Vassos, 2017). Consequently, immersive methods with their interactive and engaging possibilities offer a new aesthetic experience and spectatorship (Bartlem, 2005), while transcending the human-technology relationship (Bartlem, 2005) and aiding museums in their new role.

2.3 Exhibition design and production

Having established the value of storytelling and immersion, it can be argued that lasting impressions which result from such narratives, can, in turn, transform the museum visit into a memorable experience for all kinds of audiences (Muthiah & Suja, 2013). The experience of visitors is an area that has gathered the interest of researchers (Dean, 2015). According to Muthiah and Suja (2013), in the journey of providing a good customer experience, design is responsible for creating the right experiences for the right consumers. Thus, different aspects of designing and producing an exhibition are discussed in the following section.

2.3.1 Exhibition design models

Everything, from material objects to immaterial processes, is the outcome of the practice of design, even if it is not immediately observable by the human eye (Margolin, 1989). In the context of museum and art spaces, Lake-Hammond and Waite (2010) described design as a function that goes beyond presentation and facilitates the transmission of information, the organization of exhibition development, and lastly provides opportunities for interactivity. Most importantly though design constitutes the binding ingredient and organizational factor of all exhibition processes (Buchanan, 1985), from concept to construction (Lake-Hammond & Waite, 2010).

As mentioned before, design processes are creative ones (Ames, Franco, & Frye, 1997). Creative processes according to Guilford (1950) refer to the sequence of thoughts and actions that lead to production. A process is widely acknowledged to be comprised of four steps (Sadler-Smith, 2015), or better known as Wallas' 'four-stage model', consisting of preparation, incubation, illumination, and verification (Wallas, 1926). Even though the model had been conceptualized decades ago, it has come to be considered fundamental in any creativity research (Sadler-Smith, 2015). It should be taken into consideration, however, that it lacks the required attention to sub-processes and variation according to the domain that is implied (Lubart, 2001); issues that are both crucial in any attempt to define a creative process.

Looking closely to some contemporary approaches, Lake-Hammond and Waite (2010) proposed a model of exhibition design which maps the roles of curator, designer, and audience by examining the case of the Museum of New Zealand. As a response to the challenges and demands for bridging the gap between expert knowledge and audiences, they created a map of exhibition design (Figure 1) (Lake-Hammond & Waite, 2010). The model acts as a preliminary approach to exhibition design with the authors calling for further research into the topic (Lake-Hammond & Waite, 2010). Nonetheless, their map highlights the intertwinement of content, concept, context, and narrative which guide the exhibition design process (Lake-Hammond & Waite, 2010). For this reason, the phases and roles within their model overlap. The present study aims to understand and

investigate in more detail the intersection between content, concept, context and narrative as it was described by Lake-Hammond and Waite (2010) which remained mostly on the surface.

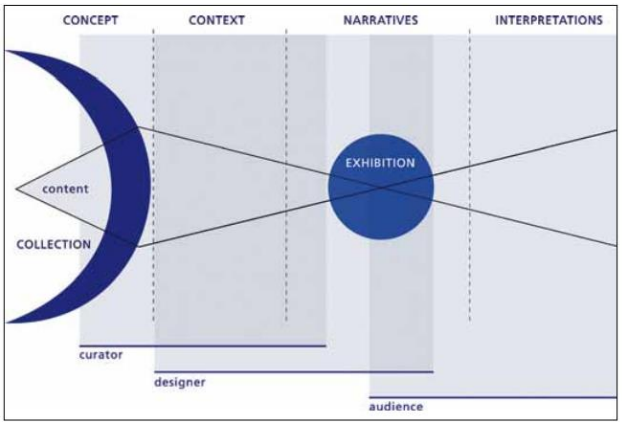

Figure 1: Model of the exhibition design process (Lake-Hammond & Waite, 2010)

Dean (2015) explored the ideal process behind exhibition development which he defined as a complex and demanding one since it involves multiple disciplines and underlined that the process varies depending on the museum. He went on to identify the phases that constitute the exhibition design process, as he supported that a clear focus on the development process can enhance all outcomes (Dean, 2015). Those are conceiving of concept, planning and development, production, functional and presenting phase, followed by assessment stages (Dean, 2015). Dean's (2015) model draws on his personal working experience and established practices in the field of museum project management, which is understudied in academic literature, as he states. He proposed that each of the stages is composed of product-oriented, management-oriented, and administrative activities (Dean, 2015). Product-oriented tasks are used to describe efforts around the collection of objects, management-oriented focuses on resources and personnel tasks, while administrative tasks include all activities that control the other two orientations (Dean, 2015). Finally, Dean (2015) acknowledged that his proposed linear model can be somewhat idealized when in reality a holistic approach that blends the margins of the separate phases reflects the process more accurately.

Davies (2010) similarly supported that a clearly defined step-by-step process cannot be determined due to its complexity, creativity and variation of activities between different exhibitions and museums; even though some tasks have to precede others (Davies, 2010; Macdonald, 2007). For his study, he investigated traditional exhibitions which he defined as "an exhibition of tangible objects in a venue for a specific time period" (2010, p. 307). Thus, Davies (2010) identified six non-linear functions behind the creation of an exhibition (Figure2), which are: initial idea and development, management and administration, design and production, understanding and attracting an audience, curatorial functions, and planning the associated program. However,

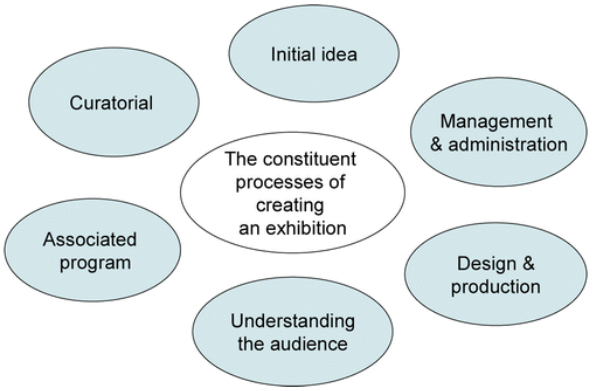

Figure 2: The key constituents of creating a traditional exhibition (Davies, 2010)

contemporary museums have moved beyond the sole placement and exhibition of artefacts (Carrozzino & Bergamasco, 2010). Exhibition design as a discipline includes all efforts of communication and culture accessibility (Carrozzino & Bergamasco, 2010; MacDonald, 2007).

One common approach throughout scholarly literature is that an interdisciplinary practice that encompasses a range of professional can contribute to the intertwinement of physical and virtual space, content and objects, visitors and information while maintaining the museum's purpose and attributes (Mason, 2015). This constitutes the main topic of the following section.

2.3.2 Collaboration and co-production approaches

It is claimed that design is often a collaborative and even social activity (Warr & O'Neill, 2005). Following the increasing interest in digitally enhanced museum experiences, a substantial part of research has highlighted the co-creative and collaborative processes in exhibition design (Olesen, Holdgaard, & Laursen, 2018). Collaborative design, in other words, co-creative, co-design or participatory exhibition development, is when individuals coming from different disciplines become part of the museum team in different design stages (Mygind, Hällman, & Bentsen, 2015). Research focusing on these processes has explored different aspects, some of which will be analyzed in the following paragraphs.

Academics have focused on how external parties are involved in the production of exhibitions (Davies, 2010; Knudsen, 2016); most notably Olesen's, Holdgaard's, and Laursen's (2018) work in digital media integration in co-design processes at Danish art museums. Their study builds upon the key findings of a large body of research that looks critically into museum co-design organizational processes (Olesen, Holdgaard, & Laursen, 2018). More specifically, they described design as a collaborative effort since ideas, knowledge, tangible objects or any other kind of resource is shared between collaborators (Olesen, Holdgaard, & Laursen, 2018). Therefore, they proposed that co-design goes beyond designing with and for audiences to include any collaboration

with individuals or groups within or outside of the museum boundaries, and which usually result in digitally enhanced exhibitions (Olesen, Holdgaard, & Laursen, 2018). This collaboration involves then museum staff, which ranges from curators to managers and external designers, as the cases studied by Olesen, Holdgaard, and Laursen (2018) illustrated. This way, the different specializations of the collaborators will infuse and refresh each design and production stage with varying viewpoints, ideas, solutions, and thus possible outcomes (Olesen, Holdgaard, & Laursen, 2018).

Another area of research focus has been on factors that influence the success of co-designed exhibitions (Ewenstein & Whyte, 2007; Govier, 2009; Lynch, 2011; Mygind, Hällman, & Bentsen, 2015; Simon, 2010). In particular, Mygind, Hällman, and Bentsen (2015) reported that proactively managing differences in language, disagreements, everyday workflow and organizational culture both contribute to the gap between different teams and influence their effectiveness. Moreover, they underlined the importance of having a consistent strategy throughout all organizational levels when engaging in collaborative development and allowing the external collaborators the freedom to make choices when needed (Mygind, Hällman, & Bentsen, 2015).

Finally, studies on interdisciplinary collaboration have focused on intermediary objects that facilitate the process (Mason, 2015; Vavoula & Mason, 2017). The extended means of creating an exhibition that has welcomed members of multidisciplinary expertise to the creative team has simultaneously altered the design and production process (Carrozzino & Bergamasco, 2010). To manage such diverse teams, a great deal of organizing visions and skills is required, provided that the goal –creating an experience that satisfies the visitor- is common between collaborators, but the disciplinary approach differs (Vavoula & Mason, 2017). Indeed, Carrozzino and Bergamasco (2010) reported on the lack of development tools in multidisciplinary teams which makes the design process more time and resource consuming. Therefore, intermediary design deliverables can be used as a mean to clarify intentions, negotiate, establish viewpoints and goals, and agree on or reject future directions along the design and production phases (Vavoula & Mason, 2017). Those deliverables are defined as objects that reflect the design stage or problem. For instance, prototyping is a mean to support the co-design process and combine knowledge from different experts (Mason, 2015).

Another aspect of co-production that was touched upon in the previous analysis has been visitors as co-creators of their experiences (Antón, Camarero, & Garrido, 2018; Macdonald, 2007; Minkiewicz, Evans, & Bridson, 2014; Simon, 2010; Skydsgaard, Møller Andersen, & King, 2016; Thyne & Hede, 2016). Noteworthy, visitor participation or co-production can make museums more relevant and accessible, enable visitor engagement, enhances the learning experience all the while addressing public's frustration regarding the exclusive and distant nature of cultural institutions

(Antón, Camarero, & Garrido, 2018; Simon, 2010). Visitors can be co-creators in two ways; either by actively participating (mentally or physically) or by interacting with the environment and other visitors and museum staff (Antón, Camarero, & Garrido, 2018). Active participation requires visitors to be able to develop and shape their own experiences physically, emotionally or mentally, and as planned by the museum or spontaneously (Antón, Camarero, & Garrido, 2018). This elevates the role of visitors from only spectators to active actors and explorers. This study, however, did not focus and go deeper on that area of research although it is acknowledged that deciding on the moments of engagement between visitors and artefacts is an integral dimension of experience design (Muthiah & Suja, 2013; Simon, 2010).

2.3.3 Changing roles within the museum team

The changing roles within museum teams have also been explored through this prism of collaboration among teams from different disciplines (Olesen, Holdgaard, & Laursen, 2018; Vavoula & Mason, 2017).

Looking closely to the roles of curators, Davies (2010) provided an account of their changing role and how exhibitions today are the outcome of a team effort. Historically, curators were the ones responsible to design an exhibition and the production process was a task solely for them (Davies, 2010). But this reality is drastically different from the way museums structure their work and staff now. This can be illustrated with the words of Hedley Swain, Director of Museums and Renaissance at Arts Council England, who remarked that “perhaps we need a new term to describe a new breed of museum professionals” (Holt, 2013, p. 30). Most importantly, there has been a “proliferation of new roles” like “information technology, education, fundraising” to name a few, infiltrating the museum team (Davies, 2010, p. 307). As a result, the curator’s role has been redefined and the specifics of it vary depending on each cultural institution since a single museum professional does not have the expertise to carry out all the components of a modern exhibition concept (Dean, 2015). In some instances, the role focuses on managerial issues whereas in other cases it holds a more academic and specialized position (Davies, 2010). Nonetheless, Davies (2010) reinforced the general agreement around exhibition design and production as being the result of a multi-disciplinary team effort.

Bowen and Giannini (2014) attributed the change within museum roles to the corresponding change in exhibition design away from a formalistic approach and towards a more ‘digitally-friendly’ one. Increasingly, the embedment of the museum ecosystem within our broader public and digital life is recognized (Bowen & Giannini, 2014). Consequently, curators had to expand their roles which created the need for a curatorial team instead (Bowen & Giannini, 2014). Dean (2015) argued that the team approach is a way to improve and diversify exhibition quality. Thus,

the museum team includes a range of experts from digital curators, graphic designers, and digital design studios to exhibition designers specialized in mixed media, digital media displays, and augmented reality, all aiming at redefining the visitor experience (Bowen & Giannini, 2014; Vavoula & Mason, 2017). This shift of importance to the presentation of exhibition content has elevated the role of designers from technical servants of the curators to participants throughout the phases of exhibition design and production (Lake-Hammond & Waite, 2010). Thus, designers are responsible for presenting information in an engaging and interesting way (Lake-Hammond & Waite, 2010). In other words, curators still hold an important position, but are not necessarily the ones who are leading the exhibition; rather a successful exhibition concept is the result of a balanced collaboration between curators and designers (Davies, 2010; Lake-Hammond & Waite, 2010).

McCall and Gray (2014) claimed that museums and galleries staff can be classified in numerous ways, but the shift of focus from the sole curator to a team emphasizes the need to understand and manage differences among team members coming from different backgrounds. Mason (2015) likewise supported that finding a common denominator among the polyphony of a multidisciplinary creative team ensures that different points of view are considered in the design process. Certainly, the differences in skills, expertise, and socio-cultural habits stemming from each discipline can create friction among team members and either halter the collaboration process or reinvigorate it. However, this study aims to move beyond the intersection of design and museum practices in collaborative exhibition development (Olesen, Holdgaard, & Laursen, 2018) and focus on the creative process that it is needed.

This chapter addressed this thesis' main theoretical points of departure to get an understanding of the overall design process of exhibitions that combine the physical with the digital aspect in the storytelling of an immersive exhibition. In essence, the language of exhibition design has been undergoing some changes since now a range of means can be employed to intensify the experience and bring culture closer to the general public (Carrozzino & Bergamasco, 2010; MacDonald, 2007). These new means blur the lines of museum boundaries and are predominantly (but not exclusively) visual technologies which place images at the heart of communication whilst interactivity alters the learning process of visitors (Carrozzino & Bergamasco, 2010; Peacock, 2008). For this reason, the present study set out to provide insights into the contemporary creative process. The next chapter looks at how this research will answer the question *What is the design and production process behind the storytelling of immersive exhibitions?* following a methodologically systemic approach.

3. Method

3.1 Research design

The present master thesis applied a qualitative research method to answer the research question given the suitability of the approach as it will be explained in more detail in this section. A main characteristic of qualitative research is its orientation towards exploration, discovery, and inductive logic (Patton, 2014); elements that enable knowledge generation from contexts that have been overlooked (Tracy, 2013). Therefore, to examine the design and production process of immersive exhibitions, which has not been the topic of considerable research, it is important to gather descriptive information first and build towards more general patterns afterwards (Patton, 2014). For this purpose, qualitative research can interpret human narratives within their contextual and social sphere in order to gather information and describe a specific phenomenon (Flick, 2009).

Another advantage of qualitative research is its ability to capture one's perspective and point of view (Yin, 2016). Accordingly, the research goal of this thesis focuses on the perspectives of professionals involved in the design and production of immersive exhibitions all the while understanding meanings, truths, and relationships between these narratives (Brennen, 2013). Actions drive processes and actions are the complex outcomes of information, insights, and influence of actors (Pettigrew, 1997). As a result, these narratives cannot be quantified thus requiring a qualitative approach to decode and link process to an outcome (Brennen, 2013; Pettigrew, 1997). Therefore, by employing a qualitative approach, the researcher can explore what is the process of designing an immersive exhibition, as it is discussed through the accounts of museum professionals, designers, and production companies.

Moreover, qualitative research approaches are described as fluid and facilitating the creation of connections between the data (Yin, 2016). In other words, the findings are continuously shaped and interpreted throughout the study, as are the theoretical themes (Yin, 2016). Overall, the flexible and systematic attributes combined with the ability to reduce data and focus on areas that relate to the research question, all the while maintaining a level of accuracy and impartiality further support the adoption of a qualitative method (Schreier, 2013).

To interpret and explore individuals' perceptions and opinions, it is required to have a conversation with them (Kvale, 2008). Consequently, the qualitative research method utilized in this thesis is semi-structured interviews due to its ability to generate empirical data by asking people about their experiences (Gubrium & Holstein, 1997). Therefore, to gather quality insights into exhibition design practices, talking to experts that work on immersive exhibitions is deemed the most efficient and concentrated method (Bogner, Littig, & Menz, 2009). To do so, an interview topic guide exploring immersive exhibitions and the process of designing them was developed. In

other words, the main themes of the topic guide represent the main theoretical themes of the study to investigate the subject thoroughly and with transparency.

Semi-structured interviews are flexible, rich in content, interactive, and meaning-making focused; attributes that facilitate the discussion of topics and concepts yet to be examined and might come forth during the interviews. Essentially, this practice allows for new dimensions of the subject to emerge without presupposing each and every one of them beforehand (Patton, 2014). Finally, the collected data was interpreted to produce the findings of the research through the method of thematic analysis.

3.2 Expert interviews and sampling

3.2.1 Expert interviews

The present research uses expert interviews since it is a more efficient and concentrated method to gather qualitative data (Bogner, Littig, & Menz, 2009). To avoid considering all opinions as expertise, it is useful to first define who can be called an expert. According to Bogner et al., an expert is "anyone who is responsible for and has privileged access to the knowledge of specific groups of people or decision-making processes" (2009, p. 100). Based on this definition, experts can provide the required knowledge to explain and structure a phenomenon in a meaningful manner (Bogner et al., 2018). Likewise, the selected interviewees are involved in projects or employed in professional areas that provide them with insider knowledge (Bogner et al., 2009). As a result, the researcher is able to gather insights by questioning and understanding professionals' opinions (Bogner et al., 2009; Tucker, 2015), which in turn allows the formation of an in-depth overview of the creative process behind immersive exhibitions.

Although a revealing and valuable method in the meaning-making process, the nature of interviews entails some implications that were taken into consideration (Hermanowicz, 2002). Certainly, issues of asymmetrical power relationships seem the most important one, given that the interviewees are considered experts in their field (Kvale, 2008). In the same premise, the balance between creating an environment that facilitates a sense of rapport whilst maintaining power relations must be acknowledged (Karnieli-Miller, Strier, & Pessach, 2009). Consequently, attention was given to the language used during the interview all the while showing awareness for the power relation dynamic by providing an opportunity to communicate criticism and alternative opinions regarding the research and method (Karnieli-Miller, Strier, & Pessach, 2009).

3.2.2 Sampling

The targeted interviewees consisted of professionals who work on the design and production of exhibitions. The participants were selected based on five criteria: their place of employment, their role, whether they operate predominantly in the Netherlands, if their participation ensures the collection of a balanced amount of expert opinions from both museums and design companies, and finally whether they create immersive exhibitions.

To begin with, participants were selected based on their place of employment which was either a museum or a company that is involved in the design and production of exhibitions. Especially for the production of exhibitions, museums and companies that design exhibitions, often oversee production even if they do not handle the production in-house. In addition, production requires a range of experts (Davies, 2010), and the aim of this research is to identify an overall design and production process, and not map out the contribution of all individual production experts.

Moreover, experts' job description had to relate to aspects of designing a museum or art exhibition as identified by Davies' (2010) functions. These are tasks related to the initial idea, management and administration, design and production, understanding the audience, associated program, curatorial (Davies, 2010). For the purpose of this study though, experts that work on tasks relating to the function of the design and production, initial idea, as well as management and administration were preferred since they had the required knowledge to answer the research question, account for the overall process of creating an exhibition and are the ones that usually influence the design process the most.

For the most part, an effort was made to approach museums and companies that operate in the Netherlands to facilitate the comparison of the collected accounts. However, given the limitations of the study, which will be described in more detail shortly, all but one participant satisfies this criterion. Nonetheless, the differentiated expert has the experience of working in an international market, the Netherlands including, since his company has offices both in Poland and the UK.

Moreover, the design of exhibitions is increasingly being considered as an interdisciplinary collaborative process (Olesen, Holdgaard, & Laursen, 2018). For this reason, an effort was made to collect views from individuals that work on different companies, who are involved in the design and production process. In other words, the research included experts from museum and cultural institutions as well as companies or agencies that aide them in designing and later producing an immersive exhibition. This way, viewpoints that concerned different aspects of exhibition design emerged and a more well-rounded design process was created.

A further and more important requirement for the selection of experts was ensuring that

they (or their place of employment) design immersive exhibitions, as it was defined in the previous chapter. Thus, a pre-selection by the researcher was made to ensure that the selected institutions, companies and in the turn the individuals working there create immersive exhibitions. In most cases, the selected companies and museums were self-proclaiming to create immersive exhibitions based on the information provided on their websites about their past and present work.

To ensure all of the requirements, the sampling technique selected for this thesis was purposeful sampling. What is more, the chosen sampling method was applied due to its ability to focus on finding rich data about a certain phenomenon and examining it in-depth (Tuckett, 2004). Purposive sampling means that certain categories within the sampling universe are represented in the final sample, which presupposes that the researcher, based on their theoretical understanding of the topic, knows the population and will choose the cases according to the research goals (Robinson, 2014). In other words, the respondents were chosen according to the researcher's judgment, to ensure the desired level of homogeneity and heterogeneity as well as having a useful and representative sample (Robinson, 2014). At the same time though, as it was expected, access to experts for interviews proved to be challenging (Littig, 2008). For this reason, snowball sampling was also employed to contact and arrange interviews with enough participants. Thus, interviewees were asked to suggest at least one other potential participant that fits the research criteria.

In total, twenty-seven interview requests were made which resulted in thirteen arranged interview meetings. However, due to circumstances that go beyond the researcher's control and resulted from the implications of the global pandemic of Covid-19, the availability of experts was limited. Accordingly, four interviewees had to cancel their participation which led to fewer than originally anticipated participants. Thus, nine interviews between 30 and 60 minutes were conducted with participants that satisfied the sampling criteria. Nonetheless, enough interviews were conducted to satisfy the guidelines and collect well-rounded views on the topic.

In more detail, cultural institutions and design companies were approached via email in which the aim of the research was explained, and they were asked to participate or suggest potential interviewees. Simultaneously, independent professionals and studios that design and produce immersive exhibitions, but are not part of the team of such institutions or companies, were contacted in the same manner. For the nine of them that agreed and managed to participate in the research, interviews were scheduled to accommodate their availability. More detailed information about the participants and their place of employment can be found in Table 1. The mix of participants' balances between cultural institutions and design companies, which ensures a deeper understanding of the design process by facilitating the creation of a level of synergy between the various collected perspectives (Tucker, 2015).

Table 1

Overview of participating experts

a/a	Name	Place of employment	Job title
Experts from cultural institutions			
1	Hedwig Wösten	Mauritshuis	Project Manager
2	Joep Heusschen	Youseum	Chief Operation Officer - Cofounder
3	Lucas Bonekamp	Stedelijk Museum	Head of Project Managers
4	Ronald van Weegen	Stedelijk Museum	Former interim Director
Experts from design and production companies			
5	Marco Ruzza	Jora Vision	Creative Director
6	Lisanne Buik	Independent	Multidisciplinary Artist & Designer
7	Łukasz Alwast	Stellar Fireworks	Chief Development Officer
8	Peter Slavenburg	NorthernLight	Director - Cofounder
9	Pepijn Wilbers	Studio Louter	Creative Partner - Managing Director

3.3 Operationalization

This section is dedicated to the operationalization of the main interview themes which were derived from the theoretical framework that was discussed in the previous chapter. Put differently, the concepts that structured and guided this research and hence the qualitative expert interviews. These are immersion and storytelling, the process of designing and producing an immersive exhibition, co-production, the required roles of a team, the role of visitors, and criticism regarding exhibition design. The process of designing an exhibition is at the heart of the investigation, with the rest of the themes providing the necessary context for the analysis. Furthermore, the additional concepts helped the researcher better understand the perceptions and opinions of experts on the subject of immersive exhibition design during the interviews. The complete interview guide can be found in Appendix A. However, to ensure flexibility, the topic guide was not as strict and extensive to allow for the emersion of new topics (Roulston & Choi, 2018).

As it was mentioned, the concepts relating to the key themes emerged from the discussion in the theoretical framework chapter; therefore Table 2 presents each question from the interview guide that contributes towards collecting the required information to answer the research question and each corresponding theoretical concept.

Table 2

Overview of interviews operationalization

Theme	Explored by interview questions
Immersion and storytelling	"How would you define immersion?" "How would you define an immersive exhibition? "How about the storytelling of an exhibition?" "What is the role of an immersive exhibition?" "Is the exhibition design changing towards a multimedia multisensory approach?" - When did the process begin to change? - Why?
Creation of an immersive exhibition	"What are the main stages of designing and producing an exhibition?" - Does the process differ from the design and production of non-immersive exhibitions and if so how?
Collaboration and co-production	"Does the design and production process require collaboration with third parties? Why?" - How has this affected the process? - How do you facilitate the process?
Roles within a team	"How has designing an immersive exhibition affected the required roles of the creative team?" - Has your own role been affected? - How?
Role of visitors	"How has designing an immersive exhibition affected visitors and their role?" - Are visitors becoming co-creators? Why? - How?
Role of cultural institutions	"Do you see a change in the role of cultural institutions due to the new means employed in exhibition design? Why" "How do you respond to criticism relating to the potential loss of an exhibition's educational role?"

3.4 Data collection

The process of contacting potential interviewees began in March and all interviews were conducted from March and throughout April. As it was mentioned before, interviews lasted approximately between 30 and 60 minutes per the request of the experts depending on the time they could dedicate to participate in the study.

The initial desire of the researcher was to conduct as many as possible interviews face-to-face. However, this was not possible due to reasons that do not concern this research. Subsequently, Skype interviews were conducted with all participants as a synchronous online service of communication to compensate for the inability of meeting participants in person (Janghorban, Roudsari, & Taghipour, 2014). Kazmer and Xie reclaimed that "the medium chosen for interviewing affects data collection and analysis" (2008, p. 258). Therefore, it should be addressed that even though face-to-face interviews allow for more interaction with the interviewees and reading their social cues and body language (Kvale, 2008); with Skype interviews, this is not as easily observed (Janghorban et al., 2014). At the same time, the nature of online communication increases the absentee rate and the ability to request the rescheduling of interviews compared to face-to-face meetings (Janghorban, Roudsari, & Taghipour, 2014), something that was evident in the present research as well.

Before the start of each interview, interviewees were informed about the objective of the research and their oral consent was requested to audio-record the discussion, in order to record their genuine answers which would later be transcribed and analyzed (Hermanowicz, 2002). Participants were also made aware that their accounts will be used for academic purposes only and that their personal information would not be disclosed. Finally, all interviews were conducted in English and transcribed verbatim.

The conducted expert interviews were semi-structured to enable further inquiry on statements which the researcher deemed important by engaging in unplanned sub-questions so that new topics might emerge (Hermanowicz, 2002; Roulston & Choi, 2018). For this reason, the topic list, embedded in theoretical concepts as stated in the operationalization section of the paper, acted as a flexible guide to facilitate the flow of each interview (Hermanowicz, 2002). Thus, some open questions were asked to ease into the main part of the discussion, establish rapport and create the appropriate environment. After that, the main list of themes which consisted of more complex questions was discussed in the middle of the interview, all the while allowing participants to bring forth concepts that might have been overlooked. Finally, closing questions were used to finish the interview on a positive note. Overall, the questions were open-ended to avoid having a fixed range of responses and explore the subject from multiple viewpoints (Ayres, 2008).

3.5 Data analysis

The transcripts of the interviews comprised the gathered data that were used to answer the research question. To do so, thematic analysis was applied to the data in order to analyze them. In essence, thematic analysis is a "method for identifying, analyzing, and reporting patterns (themes) within data" (Braun & Clarke, 2006, p.79). Braun and Clarke (2006) supported that themes

capture the required data to answer the research question. They explained, however, that to render a recurring account as a theme it is up to the researcher's judgment to determine whether it denotes something important in relation to the research question, and not a matter of appearing frequently (Braun & Clarke, 2006). Overall, the method is flexible, can reduce data into comprehensible themes, and is a suitable method for eliciting meanings (Boeije, 2010; Braun & Clarke, 2006).

Therefore, for the interpretation of the data, the six-phase process of thematic analysis as proposed by Braun and Clarke (2006) was followed. In more detail, first, the process requires becoming familiar with the data which was done through interviewing, transcribing, and repetitive reading of the data (Braun & Clarke, 2006). Then, the open coding procedure began to reduce and classify the data set by coding segments of data, thus generating the initial codes (Braun & Clarke, 2006). Put differently, the parts of the transcripts that were deemed relevant to answer the research question were organized methodologically (Braun & Clarke, 2006). This was followed by the creation of potential broader themes and subsequently their review to define the essence and name each one (Braun & Clarke, 2006). At the same time, the relationship between themes and sub-themes was explored to refine the specifics of each theme (Braun & Clarke, 2006). For the abovementioned steps, Atlas.ti was employed by the researcher to facilitate and organize the analysis process. Finally, the report of the results, as it is presented in the following chapter, concluded the analysis.

The coding tree of the analysis can be found in Appendix C. The identified main categories aim to provide an answer to the research question by forming a process of individual or collective events, actions, and activities unfolding over time in the context of exhibition design (Pettigrew, 1997).

3.6 Validity, reliability and ethics

To conclude this chapter, it is important to address the reliability, validity, and ethical concerns of the research. Regarding the ethical aspect of the study, all participants were provided with a consent form asking for their permission to audio record the discussion to facilitate the analysis for academic purposes only. Given that the present research does not concern any sensitive topics, there were no ethical implications with the nature of the questions. Nonetheless, given that perhaps some of the information might be considered confidential and experts might not want to disclose them, the consent form clearly stated their right to refrain from answering any question they wished to. In addition, participants were informed that the interview will not be anonymized should they not have any opposition. For all the above and considering that the

interviews were conducted via Skype, their oral consent was requested and eventually obtained, in order to continue with the interview.

Moving on, the iterative nature of qualitative research is acknowledged and can potentially pose a limiting factor in the overall results (Silverman, 2011). Therefore, the study revised the research design and informed the implementation procedure as much as necessary. Furthermore, the present study is oriented around individual perspectives which beg the concern of which of the pluralistic accounts to include (Buchanan & Dawson, 2007). For this reason, the researcher accounted for all narratives, even the deviant cases and not just the dominant one (Silverman, 2011). In addition, for the validity of the findings, the developed themes were constantly compared with the theoretical concepts before concluding on the final results (Silverman, 2011). Lastly, the purposeful sampling procedure increased the validity of the results since certain quality criteria had to be met which a random sampling method could not guarantee.

As far as the role and influence of the researcher are concerned, the findings of the study were directly affected by the researcher's personal interpretations, scripting of the data and reflections, necessary in any qualitative analysis (Buchanan & Dawson, 2007; Silverman, 2011). Thus, Silverman's (2011) suggested methods to limit the biased influence of the researcher were followed to further ensure the transparency of the research. In more detail, the study was documented every step of the way. This included detailed records of every interview and participant, transcripts of the discussions, and most importantly transparency in the coding procedure of the results (Silverman, 2011). All of the interview recordings and transcripts were kept and submitted along this paper to support the reliability and validity claims made here. Moreover, clear and comprehensive questions comprised the interview guide which was common for all discussions (Silverman, 2011), with only slight variations depending on the place of employment of each participant. To increase the credibility of the research and minimize subjective interpretations, all concepts used in the interviews which consequently shaped the findings were derived from the theoretical framework (Silverman, 2011).

Finally, expert interviews and thematic analysis are acknowledged as suitable and effective methods within the museum and cultural studies (Bogner et al., 2018; Tucker, 2015; Yin, 2016).

4. Results

The present research aimed to explore the design and production process behind the storytelling of immersive exhibitions in museums and art spaces. To answer the research question, the themes that emerged from the discussions and their interpretation are presented in this section. The complete coding tree can be found in Appendix C.

The data analysis revealed five phases that constitute the identified creation process of immersive exhibitions. Those are initial, concept, design, production and opening phase as they are depicted in Figure 3. For the remaining chapter, first, some general remarks regarding immersive exhibitions will be presented, then the identified core characteristics of the design and production process will be outlined, and finally, the five main phases and the tasks that fall under each of them will be explored in more detail.

4.1 Immersive exhibitions

When asking participants what an immersive exhibition is, most respondents defined immersion as an experience that surrounds the art, instead of just showing it. Joep Heusschen, Chief Operation Officer and Cofounder of experiential art museum Youseum, illustrated this by employing the example of an exhibition in Rijksmuseum "where you could dress as the subjects of the painter, so you could literally feel how these people felt when they were being painted". Similarly, Ronald van Weegen, former interim Director of Stedelijk Museum, connected immersion with the increasingly hybrid identity of museums, where many disciplines meet and artists or visitors are actively involved, making them part of the artwork. Interestingly, he used the term 'hybrid' to denote the multidisciplinary, but not necessarily the digital identity of museums. One design expert described immersion as a journey that submerges visitors inside of a "360-degree emotional sensorial experience" (Ruzza, Jora Vision). Peter Slavenburg, Director and Cofounder of NorthernLight, who designs transformative experiences for museums, exemplified how immersion adds a layer of inspiration and emotion to the stories being told. Two other experts defined immersion as a setting that derides visitors from the setting that they were before, grounding them to the moment while dissolving any disbelief (Alwast, Stellar Fireworks; Buik, Designer). In addition, Lisanne Buik, an independent multidisciplinary artist and designer, pointed out that immersion makes art more approachable and appeals to a more diverse and younger audience. Pepijn Wilbers, Creative Partner and Managing Director of Studio Louter, a company that designs and produces museum exhibitions, described immersion as diving into a story and argued that even space and its architecture can already be defined as immersive, if done correctly. Most experts, nevertheless, stressed that immersion is not dependent on technology. At the same time, two of the experts acknowledged the downfall of equating art to entertainment, with Lucas Bonekamp, head of

Project Managers at Stedelijk Museum, admitting that "it is a tricky line, because you do not want exhibitions to be an attraction". To summarize, imerssiveness in contemporary exhibition design can be characterized as a layer that surrounds the exhibits, used to submerge and ground visitors in the storyline by stimulating visitors' senses in order to fully experience the exhibition on an emotional and cognitive level.

Immersion is employed to give the extra layer to nearly all exhibitions as the majority of the experts expressed. Bonekamp (Stedelijk) had the following to say when asked to summarize why they, as a museum, choose to create immersive exhibitions:

> Because it is expected of us and because the audience is far more educated than it was, like 20, 30, 40 years ago. We do not want to be a museum that is simply an encyclopaedia and tells you what to know and what to expect and what to, how to perceive artworks. We very much want to involve people to make up their own minds (...) to place them in a context and to challenge the audience, to reflect on it themselves that is sometimes very difficult but it is very important to do (…) and that is what people expect. (Bonekamp, Stedelijk)

His view was reflected in the accounts of most experts who drew attention to the refined role of visitors, now placed at the centre of attention in an exhibition. This way visitors experience the artefacts more actively not through a "guided process", but more autonomously and organically (Van Weegen, Stedelijk). Consequently, museums want to create discussions around their exhibitions without imposing their own view but allowing visitors to interact, be challenged, and form their own opinions, hence making them co-creators this way. "You are challenged to think, to participate (…) it is not simply an aesthetical experience anymore", Bonekamp (Stedelijk) argued. This consists a change in exhibition approaches towards audience-centred experiences, which is only amplified with the rise of immersive "Instagram museums"[1] as most experts underlined. Heusschen (Youseum) being the co-founder of one such museums, signified the elevated role of visitors by saying: "You are so important that you need a museum. We build it for you. It's called Youseum." At the same time though, he acknowledges the duality in this statement and emphasizes that visitors are being put at the heart of the exhibition primarily to be challenged and intensify the impact of the exhibition. In essence, this move away from curatorial authority and towards audience-centred exhibition was epitomised in Łukasz Alwast's, Chief Development Officer of design and production studio Stellar Fireworks, statement: "You can see a divergence between institutions that get what modern experience design is, that user experience of the visitors is very high on their agenda".

[1] An "Instagram museum" is an art experience of multiple different rooms and installations that offers photo opportunities for its visitors and aims to immerse audiences in the experience.

As it became apparent from the expert discussions, visitors' needs influence all aspects of the exhibition design. Therefore, museums aim to design memorable experiences which can create memories for their visitors. From the above mentioned, it can be argued that to do so, an exhibition needs to engage and involve visitors. Van Weegen (Stedelijk) thus pointed out that "what you try to do as a museum is to create a story and get people involved in that story". To achieve this, all experts placed importance on storytelling as the starting point for every creative process. From their accounts, it was determined that the storyline of the exhibition or exhibition concept as some of the experts described it, guides the design and production process and ultimately defines the immersive elements of the exhibition. In other words, immersion is the translation of the story and its meaning into reality for the public (Ruzza, Jora Vision; Wilbers, Studio Louter). Similarly, Slavenburg (NorthernLight) indicated the relationship between storytelling and immersion by arguing that "we need the immersion to bring the inspirational and emotional side of stories to people (...) so whatever is the topic, the immersion will add a layer of inspiration and emotion to what people convey". Visitors will then be immersed to feel as if they are part of the story and will interpret the narrative not only through reading but using their other senses such as touching, smelling, hearing, talking and even feeling (Heusschen, Youseum).

4.2 Characteristics of the design and production process

> I think that is a thing in museum studies, you always learn about working in a museum, but not all the work of an exhibition is being done in a museum. I always call it the onion. There are so many layers around the core (...) so many more companies involved, just look at the credit lines. You always see a whole list of people that are involved in making the exhibition. (Wösten, Mauritshuis)

The above quotation from Hedwig Wösten, Project Manager of the Mauritshuis museum, illustrates how museums need the co-operation of multiple collaborators to bring an immersive exhibition to life, as it was confirmed by all interviewees regardless of their place of employment. Therefore, specialists from different disciplines become part of the museum team during the different stages of the creative process. Consequently, to identify the creative process of an immersive exhibition, the account of experts from the side of the museum and their collaborators is needed, in this case, design and production companies or freelancers. Both stakeholders are active players and initiate, lead, and perform creative work in order to produce the end result. Therefore, Figure 3 visualizes the design and production process which consist of five phases and twenty-five steps. Together they form the process of creating immersive exhibitions.

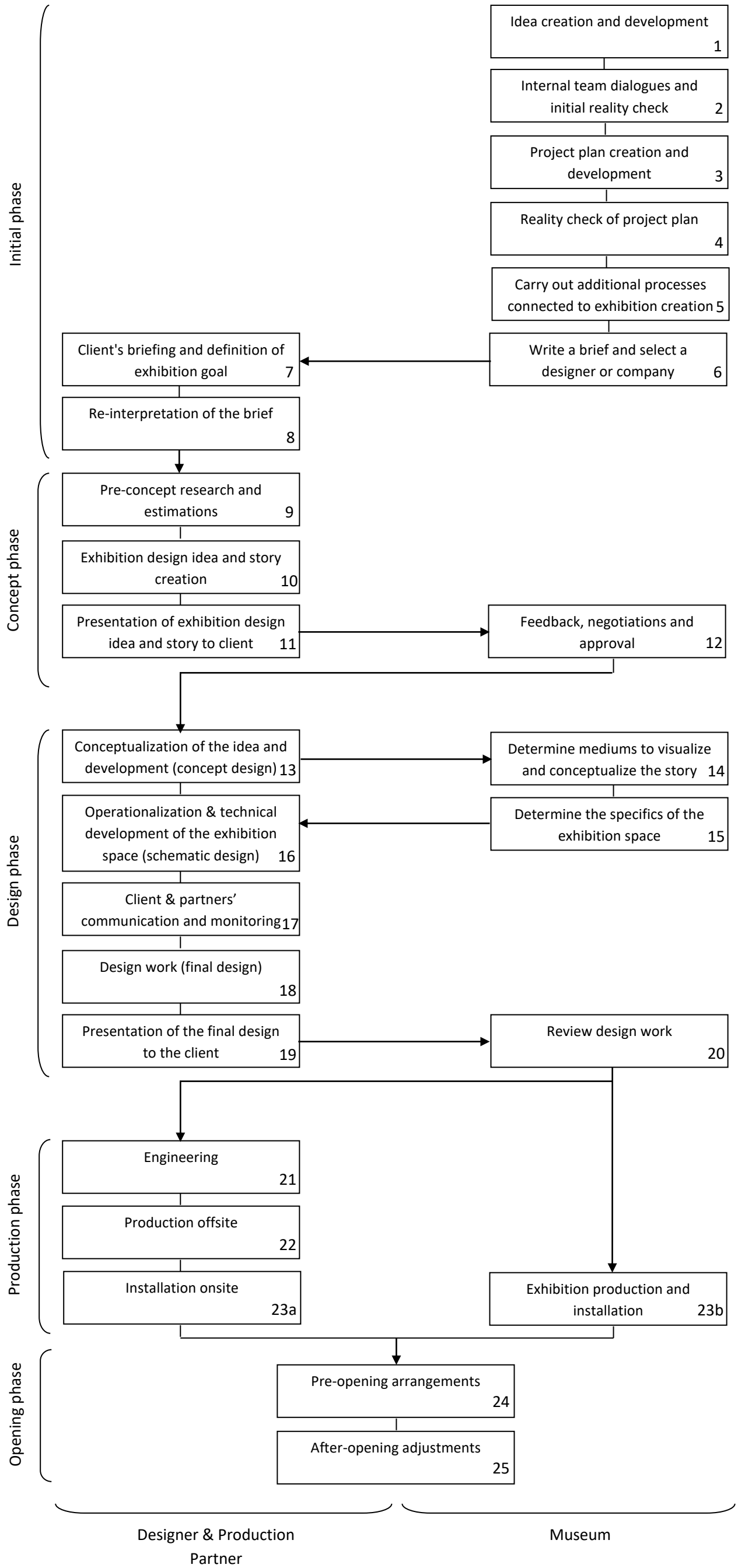

Figure 3: Creation process of immersive exhibitions

Notably, the sub-steps were described by the interviewees as "projects" that together create an exhibition and which sometimes progress in a less linear manner and rather simultaneously; even though some phases must clearly precede others. Interestingly, interviewees also highlighted how the creative nature of the process makes it difficult to explain it as a straightforward line of steps (Heusschen, Youseum; Van Weegen, Stedelijk). For this reason, each phase must be completed before the next one commences, however, the sub-process that constitute each phase might at times progress simultaneously. In essence, the design and production process of immersive exhibitions was described as a multi-stage, creative, and collaborative process that requires the involvement of many parties.

Looking to explore what differentiates the creative process behind immersive exhibitions, Wilbers (Studio Louter) interestingly had the following to say:

> I do not see a very big difference in that [creation process], because I think an exhibition, good exhibition, is always immersive. And I think an exhibition that is not immersive is not a good exhibition. (Wilbers, Studio Louter)

The quotation from Wilbers (Studio Louter) hence indicates how integrated immersive exhibitions are in contemporary museum exhibition design.

4.3 Initial phase

The start of every immersive exhibition originates amongst a museum team where a very first *initial idea is created and slowly developed* (step 1). All museum experts emphasized that coming up with an initial idea is the first step of any exhibition. This idea might be generated from a curator or artistic director (Bonekamp, Stedelijk; Van Weegen, Stedelijk), it could be the result of a co-production with another museum (Van Weegen, Stedelijk), or it could be born out of suggestions from third parties such as designers, experts, or even visitors (Heusschen, Youseum). This idea is shaped and reshaped along the process, but the museum team is responsible for deciding what an exhibition will be about. As Van Weegen revealed:

> So the curator or the artistic director or somebody else in your organization, but mostly the curator or the artistic director has a view or a certain idea and it could be around an artist or it could be around a theme, it could be because it is a co-production with another museum for that other country so it is just an adopted idea or well, it could be anything. (Van Weegen, Stedelijk)

He further argued that "we have specific curators who are responsible for these [immersive] kinds of exhibitions. So, they are used to work with the dynamics of an immersive exhibition". All experts pointed out varying factors that might influence this initial idea generation but placed importance on developing an idea that puts visitors at the heart of the exhibition (Heusschen, Youseum), one

that confronts and challenges audiences (Wösten, Mauritshuis), and that fits the rest of the museum portfolio and museum identity (Van Weegen, Stedelijk). It should be noted also, that all experts placed emphasis on developing an exhibition topic that has some sort of societal topic and is able to create a discussion, since the ability to generate conversations was directly connected to the production of an audience-centred exhibition. Therefore, the topic choice of the exhibition idea is considered carefully, all the while avoiding presupposing how it should be interpreted by visitors.

Then, this initial idea will be the subject of a *first internal reality check* (step 2). More specifically, the museum team will have discussions in "a sort of peer review" manner (Bonekamp, Stedelijk). According to the museum experts, the internal dialogues are expanded to involve broader teams of museum staff and their feedback will result in a first 'go' for the idea to start working on its development (Bonekamp, Stedelijk; Van Weegen, Stedelijk).

This will bring the museum team to *create and develop a project plan* (step 3) of the exhibition. A project plan answers questions such as: "What is possible? What could be the storyline? Which artworks do we need? Is it a living artist or is it already an artist who has passed away?" in order to make all aspects of the exhibition more specific and concrete (Van Weegen, Stedelijk). Furthermore, the majority of the museum experts outlined these aspects as the need to determine a general story that brings across the message, the artefacts needed, the required budget and funding, and the team that will work on the exhibition.

The project plan will then be going through a *reality check* (step 4) to receive the necessary approval to officially commence the creation of the exhibition. "And from that comes a document which goes through the directors for approval", Bonekamp (Stedelijk) explained. The reality check involves checking the feasibility of the project plan together with all museum departments' directors, the availability of budget, people, resources, and space, and considering the rest of the exhibition mix in order to get the director's approval as the majority of the museum experts described.

During the initial phase, the museum team has to also *carry out additional processes* which are connected to the creation of the exhibition (step 5). These are specific processes for marketing and communication, loan of artworks, funding and sponsoring, co-creating with foundations and living artists, and creation of educational additions, programs, and catalogues. This results in gradually broadening the team to involve all museum departments while everyone continuously works on the next process of the plan, outlined two experts. According to Wösten (Mauritshuis), these are activities that they always have to go through no matter the nature and size of the exhibition. However, she (and the majority of experts) underlined how immersive exhibitions require more effort, bigger budgets, and to upscale all their activities even though "we are quite used to it because we try to give that extra layer, that extra experience to merely all our

exhibitions", Bonekamp (Stedelijk) argued. Another important additional process connected to immersive exhibitions is taking appropriate measure to accommodate larger crowds, something that was stressed by two museum experts. To illustrate this need, Wösten (Mauritshuis) pointed out that: "With an immersive exhibition, you have to think of sometimes things that are outside the exhibition. So (...) cues, where are you going to put down the cues, (...) those smaller things that are added to an exhibition".

All of the museum experts emphasized the importance of cross-domain exhibition creation and explained that they could not possibly carry out the process on their own. Therefore, the museum teams' last task for the initial phase is to *write a brief and ultimately select a freelance designer or a design and production company* (step 6) to assist them for the remaining process. Bonekamp (Stedelijk) named art handlers, conservators, designers (theatrical and graphic), and curatorial boards as their main collaborators. Van Weegen (Stedelijk) mentioned freelancers, owners of artwork, foundations, technicians, writers, painters, video art, and performers, while Wösten (Mauritshuis) and Heusschen (Youseum) placed more emphasis on designers and companies that do concept creation. Interestingly, Heusschen (Youseum) argued: "We buy in expertise and knowledge and creativity from (...) agencies or artists (...) what we do is we initiate it and we guide it, but we tap into other people's knowledge, expertise, creativity, contribution to make it work". Thus, this step marks the beginning of the collaborative process. Additionally, for the brief or pitch depending if they decide to approach directly a partner or they choose to address a pitch to several designers and then make a pick respectively, they have to explain "the whole story, the budget, the look and feel, but also what we can do and what we cannot do, so the limits of the space" (Wösten, Mauritshuis). The list of possible designers is constantly renewed with designers who have designed exhibitions for other museums, designers found through professional connections or even designers discovered online, according to Wösten (Mauritshuis). Consequently, this step will come to an end once the museum team decides on a design partner who will accompany and aide them until the opening of the exhibition.

The role of a design and production partner starts with *receiving the brief from the client*, meaning the museum, and *establishing the 'facts' of the exhibition* (step 7). The majority of the design and production experts stated that their role starts once they receive a client's brief containing the goal and purpose of the exhibition. Accordingly, Marco Ruzza, Creative Director of Jora Vision, a design and production company, simply described this step as: "the client comes to us and he says, listen, I have this collection of objects and I want to make an exhibition about it, and we want to tell the story of this object. Then the purpose and the target for our exhibition is exactly that". Similarly, Wilbers (Studio Louter) felt that it is important to first establish the 'facts' of the exhibition stating:

> If you want to tell a story in a museum, you have to look at it at different levels. So, at first, you have to look at the facts or the objective side of the story. And it is also the question: What do I learn? So, these are mostly objects or persons or years or really facts. And that is the thing that's most obvious. And that is the first thing a museum client comes to us. (Wilbers, Studio Louter)

Thus, the content of the exhibition (which is usually a collection of objects) serves as a base to create the exhibition concept.

The final step to conclude the initial phase is for the design and production partner to *re-interpret the brief* (step 8). "The first task is re-interpretation of that brief, because very often the teams who are writing the brief, they do not have the experience or language or framework to generally go through that process", Alwast (Stellar Fireworks) explained. Put differently, he stressed the need to "establishing a common language with the client" in cases when the museum team they work with do not have the experience or knowledge to produce an extensive brief and guide the process effectively (Alwast, Stellar Fireworks). This is only heightened when inexperienced teams have unrealistic aspirations which have to be addressed in order for the rest of the process to run smoothly (Alwast, Stellar Fireworks). Thus, the re-interpretation is used as a way to reach a common denominator between the two stakeholders. In addition, Ruzza (Jora Vision) attributed importance to establishing early in the process "how important is the educational aspect of the exhibition compared to the entertainment aspect (...) to make sure that this balance is already from the beginning agreed with the client". This step completes the first phase of the design and production of immersive exhibitions and in essence is laying the groundwork for the phases to come.

4.4 Concept phase

The concept phase begins with some *pre-concept research and estimations* regarding the exhibition plan (step 9) by the design and production partner. The majority of the design and production experts stressed the importance of conducting research about the topic or collections and exploring the meaning and relevancy of the exhibition before coming up with an exhibition idea, especially when the client does not have a clear exhibition vision. Ruzza (Jora Vision) explained this step as "a sort of a combination of a feasibility study and a very initial creative cost". In more detail, he further clarified:

> The feasibility study is with the advice of specialists. We try to analyse all the data about the idea of the clients, for example how many visitors do they want to have, how much money they have for the budget, the location, all the kind of aspect of the location, for example, are there any other museums around? (...) So we make an analysis of the

> competitors to understand if the idea that they have is actually successful. (Ruzza, Jora Vision)

Thus, this step serves as the first feasibility, cost, competition, and idea review. Slavenburg (NorthernLight) described the pre-concept step as "looking at what you want to achieve; totally diving into the why". Similarly, Wilbers emphasised the need to explore the reasons behind an exhibition "why is this relevant? (...) Why do I have to know this? (...) give meaning to the story and meaning is something that is relevant for you, as a visitor", while simultaneously looking into the emotion or "what in film or literature, you can also call it the genre".

All design and production experts mentioned that the *exhibition design idea and story creation* (step 10) is a core element and crucial moment for the overall process. Ultimately, museums want to create stories that people want to engage with since every exhibition is a story. Buik (Designer) emphasised the importance of having "new and fresh original ideas" even more so than the "actual design or how it looks". From the museum's point of view, Lucas Bonekamp argued that the concept is equally important as the artwork. Interestingly, the exhibition concept is the outcome of the combined effort of both stakeholders. Concept creation concerns the storyline and should not be confused with the design (Slavenburg, NorthernLight). Moreover, the concept or story needs to fit the why, what, and the target group as it was defined in the previous step. The outcome of this step is a big idea which contains "values, emotions, messages and limitations that you are aware of", Alwast (Stellar Fireworks) pointed out. He further explained that a big idea acts as a narrative arc which will be the reference point throughout the creative process, and in addition, its narrative, functional as well as the emotional side will be determined by the end of this step. Ruzza (Jora Vision) followed this notion and argued that storytelling is the base and starting point for everything. He elaborated on his point, explaining:

> It is important to first define what kind of story we want to tell. And our first step is then to write a story about what kind of experience we want the visitors to achieve (...) so based on that analysis, we are able to start thinking about the physical aspects of the exhibition. But once we have this, ideally, we have a clearer idea. (Ruzza, Jora Vision)

In addition, he acknowledged that "eventually the storyline helps you to find a way to get into the immersive exhibition". Accordingly, Wilbers (Studio Louter) clarified that "we use immersion to not as means by itself, but to transform the meaning of a story to the public (...) so that is very important when you make an immersive exhibition that you have got the story right ", hence connecting the storytelling of the exhibition to immersion.

Having defined a concept, the next step is the *presentation of the exhibition design idea and story to get the approval of the museum team* (step 11). All design and production experts expressed the same need to present the outcome of each process step to the client, get their

approval, and move on to the next stage. What is more, two out of the five experts stressed the need to sign off things with the client and move on, meaning to avoid coming back to issues that have already been green-lit.

Simultaneously, the museum team *provides regular feedback to their partners, negotiates with them, and gives the green light to move on to the next phase* (step 12). Interestingly, two museum experts described having a frequent back and forth communication with their partners to give advice on output and ask for input, hence incorporating in a way the external collaborators to the team. Wösten (Mauritshuis) outlined:

> We have more of what I call a ping-pong relationship. So, I tell them what our message is. They come with feedback. So, we have more frequent conversations. (...) it's more of a process that you work together, and you go back and forth the whole time. (Wösten, Mauritshuis)

To have this level of synergy, there needs to be someone from the side of the museum who is appointed to be in charge of communicating and checking with the partners as one museum and one design expert argued. In doing so, the communication flows smoothly between the two collaborators, the museum team maintains control over the process and their approval is required to move unto the following phase.

4.5 Design phase

With the completion of the concept phase, the design phase commences and both the museum and their design and production partner work and collaborate on different exhibition design aspects.

According to the design and production experts, a range of activities that are connected with the first step of this phase can be summarized as the *conceptualization of the idea and its development* (step 13). The majority of experts used terms such as master planning, sketch design, or concept design to describe the tasks that fall under this step. However, concept design should not be confused with the concept phase that was described earlier which depicts the story of the exhibition (Slavenburg, NorthernLight). The experts stated that through this step the story is translated to a realistic concept and it is determined how exactly it will come to life. Indeed, Ruzza (Jora Vision) argued that: “The story is something that you have in your mind, that you can write down (...) and the immersive aspect of the exhibition it is actually the way you translate the story (...) into reality”.

What is more, the experts explained that an integral activity of materialising the exhibition idea is determining what each room will be by assigning a theme, emotions, and objects to each one, thus, creating a map of the exhibition journey and its look and feel. In the matter of

conceptualizing the idea, two experts expressed the need to also determine the mediums required to visualize the story such as the material, the media, the decoration, and the interior design elements which are required. For instance, Buik (Designer) claimed that the story "will also inform the materials and the media that you will use". She, moreover, drew attention to the overuse of technology to the point where it becomes the goal when it is role should be to support the creation of immersive exhibitions. Hence, technology and multimedia should be used when they can strengthen the exhibition story since "you can also create immersive experiences by having such a massively fantastic idea and put it in itself in the middle of the room and it just evokes this emotion in people"; a view that was backed up by one of the museum experts as well. Similarly, Slavenburg (NorthernLight) recalled an immersive exhibition created nearly 25 years ago when contemporary technologies like VR or AR had not been discovered to point out that immersion is media independent and their job is to find the right method for each exhibition.

An important aspect of the idea conceptualization is to take into consideration the capabilities and limitations, something that was underlined by two experts. Accordingly, Alwast (Stellar Firework) stressed the need to "adjust to the space, to the architecture, to the budget, to the production capacities, etc". Similarly, considering one of the exhibitions that she had designed, Buik recalled how the specifics of the exhibition were directly influenced by the available budget, which meant that she could not incorporate multisensory elements to the design given the available resources.

Closely linked to this notion is designing based on the characteristics of the space as it was argued by two experts. Indeed, the design of the story will be influenced by the space it will be installed. Interestingly, Wilbers (Studio Louter) claimed that:

> Spaces have also got their own laws and their own characteristics (...) and that is a very invisible part of designing, but a very important part, because if you are trying fit a story into a building and that does not fit, then you have got a problem (...) so you line up the story in the building and you make it one logical thing. (Wilbers, Studio Louter)

He further linked his point to the routings of the building, which is the way people are going to walk through the building. In his own words: "that has got a lot to do with where are the staircases, where are the doors? Where are the hallways? What's the idea of a space? And then you can form your story in the building to one experience". Thus, the expert implied that, for instance, you cannot make a linear story in a space where visitors have multiple points of entrance since direction plays a role in the way visitors will digest the story.

Another important aspect in immersive exhibition design is creating synaesthesia since "storytelling as well is stronger if it goes through all the senses (...) I can share a story through all the senses in that space and anchor people in a moment of wonder in that space" (Buik, Designer).

Along the same line, Alwast (Stellar Firework) underlined that an immersive exhibition has to stimulate multiple senses at the same time and in a holistic manner. Notably, Wösten (Mauritshuis) who is a museum expert followed this notion and argued: “I think that the feeling is what you take home. And I think that you will get a feeling by telling a good story. And not only factual but also emotionally, like the senses”.

Furthermore, experts also placed emphasis on visitors’ role meaning everything that the visitor will experience, do, and see in each exhibition room. Alwast (Stellar Firework) described this as “interaction design” or, put differently, if there are elements of interactivity and how they should work. In addition, the role of the visitor has an influence on the broader echo system and services around the exhibition:

> You can also connect emotions to what you want people to do. So, for example, if you want people to feel good and then at the end, for example, buy some additional services or even not like force them to do it, but just prompt them to do it. (...) Then you build like a larger ecosystem that you are not designing, only an exhibition, you are designing (...) an experience which has connected events, a marketing campaign (...) and props that are around that experience. (Alwast, Stellar Firework)

In other words, the intent of designers to evoke certain emotions in visitors affects the exhibition design, a finding that was expressed by other participants as well.

Lastly, all design and production experts expressed that seeking the advice of other experts such as design researchers, writers, architectural designers, and spatial designers early on in the process is another important aspect connected to the conceptualization of the idea. Indeed, Slavenburg (NorthernLight) illustrated this interdisciplinary collaboration:

> We have a whole layer of experts around us. So other designers, architects, urban planners, (...) a lot of content experts sometimes on historic content, art content, science content. So, we've defined about twelve expertise layers around us and we will get those involved. I do not think we do any process without any expertise from outside. It, it helps. And it is also nice. You should not stay in your own little circle too long. Get some fresh inspiration. (Slavenburg, NorthernLight)

His sentiment was echoed by the majority of experts and showcases the intertwinement of different partners coming from different disciplines along the design process. Furthermore, Buik (Designer) expressed how having multi-disciplinary collaborators makes the process more interesting and provides an opportunity to learn new things.

At the same time, the museum team has to authorize decisions such as *determining the required mediums to visualize and conceptualize the story* (step 14). Thus, the museum stakeholders are actively involved in the process. Indeed, according to Wilbers (Studio Louter): “of

course, the client is looking and (...) he sees everything, in every step". Most importantly, museum experts highlighted the different ways now available to transfer the message, and the need to choose mediums that deepen the story, add value to the art, consider the limitations of the space, and are used consistently throughout the exhibition. This was also emphasized during the interview with Bonekamp (Stedelijk) where he explained how "there are all kinds of new media, audio-visual means (...) in a sense they dictate how you, make an exhibition, how you tell the story within an exhibition". Accordingly, Wösten (Mauritshuis) noted that "multimedia is perfect if it tells the story, it has to tell the story and it has to be in favour of the art". She further noted how many museums nowadays hold on to the idea that modernity equals having screens when in reality the story consists the starting point and the mediums chosen, whether they are analogue or multimedia, should add a different layer to the exhibition.

Simultaneously, the museum team in communication with the design and production experts have to *determine the specifics of the exhibition space* (step 15). During this step it is important to figure out details and conditions of the room like the size, the lighting, the floor, the routings, the colours, and having walls or no walls (Van Weegen, Stedelijk). In view of this, Wösten (Mauritshuis) claimed that they aim to create a unique feel and look for the space each time, no matter how small the exhibition space might be.

The next step of the design phase is *the operationalization and technical development of the exhibition* or schematic design (step 16) as it was described the design and production experts. This step is a form of pre-production in which the team operationalizes the concept (Alwast, Stellar Firework). According to Ruzza (Jora Vision), "a schematic design is really more the technical development of everything inside the exhibition space, inside each room (...) you have to think about lighting, you have to think about the hardware or the computer, the projection, the screen". Consequently, experts explained that the concept receives a reality check primarily under the premise of required budgets and resources to make any necessary adjustments. Another expert noted that during this step they are tasked with making a detailed synopsis of each exhibition space containing everything from the concept, and emotion to the story elements and visualizing them through drawings, text, and 3D renders. Nonetheless, the majority of experts agreed that again for this step the collaboration with specialists is essential. Therefore, in addition to the experts mentioned in the previous step, the contribution of multimedia experts, other designers, production specialists and art directors is requested, as it was mentioned by four participants. Interestingly, Ruzza (Jora Vision) attributed more emphasis on the value of input from production specialists, so that, the design does not exceed production budgets or the team loses track of what is feasible. The interviewees, thus, revealed that the consultation of production specialists is

required even during the design process and are not viewed solely as supportive personnel during the final stage of the process.

As it becomes apparent from the last two steps, the design and production team has to seek advice and collaborate with other experts throughout the design phase. Thus, it is important to *communicate and monitor* both with their partners and have open communication with the museum team which is their client (step 17). In view of this, Buik (Designer) drew on a memory of one of her recent immersive exhibitions and explained:

> I had to communicate with and come through conclusion (...) of what we wanted to do. So, eventually, I had some freedom, but I had not full freedom of designing what I wanted. (...) Then it would be checked with the museum, and so we would move back and forth. (...) And there were couple of deadlines and we worked on it in total for let's say five months. (Buik, Designer)

Likewise, Alwast (Stellar Firework) pointed out their responsibility for assembling the right team and then overseeing their execution of the plan. In addition, Ruzza (Jora Vision) felt that weekly meetings with their partners are necessary to get their input and feedback.

All design and production experts agreed that the next step for them in the design phase is the *design work* or in other words creating the final design (step 18). The final or definite design indicates in detail all aspects of the exhibition in order to "create packages of design work that the client can send out to suppliers to be able to make a bid, to be able to make a quotation for", (Ruzza, Jora Vision). Likewise, Buik (Designer) described this process as drawing up scenarios that would result in a definite design containing a mood board, a keynote, and any kind of scripts for the multimedia. According to Wilbers (Studio Louter), the advice of a spatial designer is important to determine all technical things during this step.

The completion of the final design work brings us to its *presentation to the museum team* (step 19) and consequently its *review* (step 20). As it was mentioned earlier, each phase concludes with the presentation of the outcome to the client in order to get their approval and move onto the next phase of the process; in this case the production. Accordingly, Alwast (Stellar Firework) noted: "at the end of that detailed design process, generally, that is the moment where the clients sign off the detailed design". The museum team on their end are responsible for reviewing the design work. Indeed, Wösten (Mauritshuis) outlined the design has to bring forth the story, give weight and meaning to the story but not be distractive, add an extra layer to the art, give a feel to the exhibition, fit the target audience and be playful. She further expressed the feeling that "design is very, very important for an exhibition to bring across that story (...) so not only designing a pretty space, but also what is the concept and how do I put it in the design?". In addition to this, the majority of experts valued a design that pleases visitors' desires, engages and requires visitors'

participation, and most importantly is digitally shareable. As far as having a digitally shareable design is concerned, Ruzza (Jora Vision) argued that clients want this “because this is for them the possibility of getting their exhibition promoted”. However, he highlighted the importance of always keeping the balance with the educational aspect of the exhibition.

4.6 Production phase

All design experts mentioned that the design phase is followed by the production one. *Engineering* (step 21) was described as the first step of the implementation of the design and is “making it technically all feasible” (Slavenburg, NorthernLight). This requirement is viewed as especially important when the design and production partner works with collaborators who were appointed by the museum and are not one of their own collaborators since they will need to do the preparation of engineering and technology themselves, and then resume supervising the remaining process (Slavenburg, NorthernLight).

The next step is the *offsite production* (step 22) during which the collaboration with production specialists is integral as all experts stressed. These collaborators range from production agencies, multimedia experts, renderers, light designers, audiovisual hardware agencies, to furniture builders and many other specialized partners. When asked about the implementation process Slavenburg (NorthernLight) said: “We always work with third parties”. Likewise, Alwast (Stellar Firework) emphasized that the difference of an immersive exhibition compared to non-immersive lies in the inclusion of specialized talent in the design and production stages. Accordingly, Wilbers (Studio Louter) pointed out that “in the production then you want to make use of the real specialists and it is not possible to have them all in your own company because it is not, we cannot pay for it”. He went on to explain that specialists make the design stronger by attributing their knowledge and craftsmanship while equating the process to that of making a movie:

> The director and scriptwriter have got a big idea and then the other people are giving all the details and make, bring the movie to life, bring the story to life. (...) Together with the client, we are the director (...) so it is a process that we do together. (Wilbers, Studio Louter)

Alwast (Stellar Firework) held a similar opinion stating that the production stage requires the expansion of the team who will execute the design plan since the production team requires the most people, and they “move into more of an executive producer role and the executive producer has line producers and (...) make sure that there are no blockages in the process”. He interestingly compared this to a funnel, explaining that “the further is out, the larger it gets “. Notably, Ruzza (Jora Vision) further stated that they work with a network of partners and while they are able to manufacture all physical elements at their own production facilities, they rely on partners “when it

comes to production or films, audio, special effects and for example computers". Therefore, specialists are essential also for the technical development of production props, which usually requires a lot of expertise, as the majority of design and production participants explained.

The final step of the production process is the *onsite installation* (step 23a) as it was described by the design and production experts. Here the collaboration with specialists continues. In essence, "all these parts come together and you end up with (...) sending the whole package to the museum and then preparing for the opening of the exhibition" (Buik, Designer). Notably, Wilbers (Studio Louter) acknowledged the need to soundscape the exhibition room for example, in an effort to illustrate how the installation works and how this might require further fine-tuning.

In respect to the museum team, they too participate in the *exhibition production and installation* (step 23b). Essentially, this step concerns the actual building of the exhibition together with specialized companies and builders, something that was addressed by the design experts and further argued by two museum experts. According to Heusschen (Youseum), during the building process, it might be necessary to "adjust (...) because some things might not work out as you had planned them to be", in order to make the exhibition even better. Nonetheless, Wösten (Mauritshuis) claimed that these adjustments that might alter the original exhibition design leave her unsatisfied at least until she gets used to the new look of the exhibition. She explained:

> I am always confronted with the things that are not perfect, because I know what the drawings were and what the final exhibition looks like. It is never like the drawings. It is never like I mean, always in construction times or during building the exhibition, things happen. That is how it works. So (...) when the opening is, they ask me, are you satisfied? I always say, not yet. Just give me time. I first have to, get used to it. (Wösten, Mauritshuis)

Part of this step is also for the museum team to write all the information shown in the exhibition, as it was claimed by Wilbers (Studio Louter) and validated by Wösten (Mauritshuis).

4.7 Opening phase

Reaching the last phase of the creative process of designing and producing immersive exhibitions, once the exhibition is ready, the stakeholders are focused on tasks concerning its opening.

In regards to *pre-opening arrangements* (step 24), there is a specific museum team who is responsible for considering all aspects of the opening of a new exhibition, such as for example making sure to invite all members, sponsors, and employees of the museum for the opening night amongst others. The museum has to also establish a team that is readily available to handle any technical issue that might arise once the exhibition opens ups. This need is heightened when multimedia is involved, as Wösten (Mauritshuis) underlined when justifying her resentment for

black screens in an exhibition space which alludes that a visitor is missing out on something. In addition, both the museum team and their design collaborator prepare for the opening, put the final touches to the exhibition and perform a 'rehearsal'. In the cases when actual performers are involved then the exhibition is rehearsed, denoting how more and more performance arts are incorporated in museum exhibitions (Van Weegen, Stedelijk). However, even in other cases, a similar rehearsal is also performed to ensure that the exhibition serves its purpose and functionality.

Nevertheless, the adjustments and efforts to optimize the exhibition do not stop once the opening is over. This is why both the museum and the design company engage in *after-opening adjustments* (step 25). Slavenburg (NorthernLight) exemplified the review and optimization of an exhibition after its opening:

> It means that you track visitors and you even change and improve things when it is opened, just like an app or a digital project. You can change an exhibition after it is open. You do not have to think, well, this is it. And I hope it works. (Slavenburg, NorthernLight)

Similarly, Heusschen (Youseum) echoed this practice and stated how museums try to listen to visitors' feedback and make improvements and rearrangements if needed. Interestingly, Alwast (Stellar Fireworks) pointed out that ultimately "it is easy to describe something as, you know, that you write that you are creating immersive exhibition. But it is really the feedback of the visitors that they say that that is how they felt" that defines the experience as immersive. His statement exemplifies the elevated role of visitors and their influence on exhibition design, which was mentioned by the majority of experts and is a way for visitors to be co-creators.

Finally, the cycle of the creation of an exhibition is completed and a new one has already begun, as the majority of experts emphasized that each creation process must begin even a few years prior to its opening.

5. Discussion

The present study sought to expand the knowledge around the creative process of immersive exhibitions, in the light of the shifting approaches in museum exhibition design. The developed model offers insights into the necessary stages to create an exhibition and the working relationship between the museum team and their primary partner which is a design and production stakeholder. The findings identified five distinct phases consisting of twenty-five steps. Thus, the following sections will discuss the contribution of the identified model to the existing literature of exhibition design models and examine the main findings of the creative process. Then, the collaborative aspect of the creative process will be explored.

5.1 Design and production model

As it became apparent from the findings, the shift of approaches in exhibition design from curatorial authority towards audience-centred experiences through the use of storytelling and immersion is gradually being established as the dominant framework in modern exhibition design. Nonetheless, previous studies have neglected issues that influence exhibition design, notably paying insufficient attention to the contributions of expertise of designers (Macdonald, 2007) and the implications of this to the design and production process. This links to the lack of discussion about the creative process behind immersive exhibitions and required incorporation of the accounts of designers and experts of the outside curatorial museum team. Based on the accounts of the interviewed experts, however, elements to immerse audiences are used in nearly all exhibitions. Thus, the findings extend our understanding of the creative process for immersive exhibitions, while simultaneously denoting changes in contemporary exhibition design in general.

Delving into the design and production process, it is presented as a two-sided model, which exhibits the required close co-operation of the museum team and their design and production partner. Moreover, the model indicates that each production phase must be completed before the next one starts, but since the creative process does not always progress in a linear manner, it should be recognized that some of the sub-steps within each phase might overlap. For this reason, the initial, concept, design, production, and opening phase are conducted in this order, however, the sub-steps that constitute each phase allow for greater flexibility to correspond to the complexity of the creative process. Nevertheless, other scholars have also attempted to map the creative process behind museum exhibitions. Interestingly, the findings of Davies's (2010) study into traditional exhibitions of tangible objects somewhat contradicts the developed model. More specifically, Davies (2010) proposed a non-linear model that contains six functions which summarize the activities behind the creation of an exhibition. Those are initial idea and development, management and administration, design and production, understanding and attracting an

audience, curatorial functions, and planning the associated program (Davies, 2010). Even though there are similarities in the activities of each function with the five identified phases, the approach behind the two models is different since Davies (2010) did not account for the progression of the process. The findings acknowledged that during a creative process, the sequence of the sub-steps might not always be maintained. However, a non-linear model cannot explicitly describe the interconnections between the phases and their sub-steps and offer a logical sequence to the overall process. Therefore, the developed model depicts a methodical template of the creative process, which is characterized as complex but with sequenced activities, and collaborative but with defined responsibilities and roles.

The five phases which structure and explain the findings offer some new insights into the creative process while at the same time substantiating some of Dean's (2015) remarks regarding the phases that were proposed in his study of museum exhibitions. More specifically, the concept and production phase are evident in both studies, whereas the design and opening phase contain activities that resemble Dean's (2015) planning and development, and functional and presenting respectively. Despite the similarities, the present study incorporated the views of design and production partners, whose involvement is usually overlooked in scholarly literature, as Macdonald (2007) pointed out. According to the findings, the involvement of a wide range of experts in the creative process is integral for the design and production of immersive exhibitions. Thus, the present study offers an alternative account to Dean's (2015) by showcasing the progression of the five phases and the division of the necessary activities between the museum and the design and production team.

Moreover, the model identified an additional phase which marks the start of the co-operation of the two stakeholders and was highlighted as an important moment during the creative process. This is the initial phase, during which the content of the exhibition which will later shape the exhibition concept is determined (Lake-Hammond & Waite, 2010). Due to the collaboration with external partners, the proposed model provides evidence of the necessary steps which are performed by both stakeholders in order to ensure that the objectives are well defined and understood. For this reason, findings suggest the importance for the museum team to brief efficiently their partners, who in turn make sure of re-interpreting the brief to agreed facts while making sure to establish a mutual understanding with their client. This extends previous studies which emphasize the significance of proactively addressing differences in backgrounds, disagreements, and lack of knowledge to establish a common language in order to successfully co-design the exhibition (Mason, 2015; Mygind, Hällman, & Bentsen, 2015). Thus, the initial phase lays the necessary groundwork for a smooth collaboration before the concept phase since the support of specialized partners will be needed until the opening of the exhibition.

The study also provides detailed insights into the multiple sub-steps that constitute each phase of the creative process, extending studies that called for more in-depth research of the process (Lake-Hammond & Waite, 2010). In other words, the model gives evidence of the specific tasks that the stakeholders need to perform to create an immersive exhibition. Most importantly, the model also depicts the collaborative nature of the creative process behind immersive exhibitions with several steps along the process that showcase the importance of communication between the two primary stakeholders. For instance, before the completion of the concept and design phase, where the majority of the creative work takes place, the museum team has to validate the outcome in order to proceed and to avoid revisiting steps that have already been agreed upon. In addition, they oversee the creative work and generally have the final say. This role is assumed by the design and production partner as well since they too have to communicate, monitor and oversee the rest of the specialists who are employed along the process. Hence, the study offers a visual representation and extends studies of interdisciplinary collaboration (Mygind, Hällman, & Bentsen, 2015; Olesen, Holdgaard, & Laursen, 2018) by showcasing the collaboration during the design and production process in the form of steps that concern such activities.

5.1.1 User experience and visitors as co-creators

The accounts of the interviewed experts highlighted the importance of designing an exhibition that allows for the participation of visitors and considers their role in the exhibition. Similarly, a plethora of previous studies has acknowledged the shift from curatorial authority and passive object display to audience-centred exhibitions (Barnes & McPherson, 2019; Dal Facco & Vassos, 2017; Lake-Hammond & Waite, 2010; Muller & Edmonds, 2006; Mygind, Hällman, & Bentsen, 2015). This resulted from the growing audience demands for more engaging experiences which ultimately impacts the exhibition design (Barnes & McPherson, 2019; Dal Facco & Vassos, 2017; Lake-Hammond & Waite, 2010; Muller & Edmonds, 2006; Wang & Lei, 2016). Thereby, visitors no longer want to only be impressed by what they see. Hence, museums try to actively engage them, challenge their perceptions, and encourage them to critically reflect on the exhibition content without offering a predetermined path of discovery. To do so, during the initial phase where the museum team creates and develops a first idea of the exhibition content and in the concept phase where the exhibition concept is created, all those objectives and visitors' needs guide and influence the process. The importance of the steps that concern an idea creation that puts visitors at the heart of the exhibition is in accordance with previous studies (Giannini & Bowen, 2016; Lake-Hammond & Waite, 2010), and shows how the creation of an appealing user experience informs the storytelling of the exhibition. Put differently, the storyline will be developed in order to

create a user experience that satisfied visitors' needs and places them at the heart of the exhibition story.

Moreover, the elevated role of visitors characterizing them even as co-creators due to their participation in the exhibition was also acknowledged as an integral element of modern experience design. Visitors' feedback is what deems them as co-creators, since it not only guides the exhibition's review and optimization efforts after the opening, but is what ultimately determines if the exhibition was immersive. Consequently, exhibition design can be seen as a co-creative process between three parties; the museum team, their primary design and production partner, and visitors, even though the latter's involvement in the process was not explored in detail.

5.1.2 Storytelling and imerssiveness

Storytelling is an important element that influences modern exhibition design and users' experience as it was mentioned before. The findings indicated the fundamental role of determining the exhibition story, which is embedded in the concept phase of the process and acts as the first important reference point for the final exhibition design. Different stories offer countless different possible avenues in exhibition design and are a way to renew the exhibition content and keep it interesting both for returning and new visitors. This way the museum team can create a narrative that challenges, inspires, and engages visitors through the story being told in the exhibition. In addition, a clearly designed storyline can assist visitors in their learning process and not limit or alienate non-expert ones. Thus, storytelling is used to convey, structure, and enhance the core exhibition message, and answer the calls of visitors for a less rigorous and collection-centred exhibition design. This showcases the importance of storytelling in the creative process and its application in fields beyond entertainment or fiction; a finding that reinforces previous literature as well (Gabriel 2000; Lake-Hammond & Waite, 2010; Lugmayr et al., 2017; Nielsen, 2014, 2017).

Moreover, the findings of the research provide an additional layer to studies detailing the capabilities of storytelling methods in museum exhibitions (Nielsen, 2014, 2017), by exploring the relationship between immersion and storytelling. More specifically, storytelling shapes the cognitive and emotional aspect of the exhibition which in turn contributes to making the visit a memorable one. Interestingly, museums use immersion to bring forth the story and communicate them to the public. Put differently, immersion is not used by itself, rather it consists of a way to convey the story to visitors and accentuate its inspirational and emotional side. Therefore, storytelling is an integral part in the creation of immersive exhibitions since it guides the museum team in determining the immersive elements which will be used.

As it was mentioned, museums employ immersion to submerge visitors in the exhibition context and story, and at the same time dissolve any disbelief in order to enhance their experience.

The immersive elements are determined during the design phase with the conceptualization and operationalization of the concept. Interestingly, the experts gave different meanings to what immersion was, but most of them referred to it as a way to provide an additional 'layer', which 'surrounds' the exhibition and related immersion to synaesthesia. This layer helps visitors lose themselves in the exhibition story by engaging all their senses and reflect on the exhibition meaning. Indeed, scholars have acknowledged the illusionistic effect of immersion which transforms art spectatorship to an active experience (Bartlem, 2005; Mortensen, 2010). Furthermore, the findings indicate that a well-executed immersive exhibition has to trigger multiple senses in a holistic way and visitors will be the ones assessing how effectively this was done. For this reason, the immersive 'layer' will determine the actual look and feel of the final exhibition.

In addition, the conceptualization and operationalization of an immersive exhibition is not dependent on technology rather is assisted by it. This finding is consistent with scholars' arguments that immersion does not equal the use of digital technologies (Bartlem, 2005; Giannini & Bowen, 2019). Accordingly, technology strengthens exhibition design by supporting the creation of a multi-sensory, visceral, and hence immersive space capable of engaging visitors in the story. Nonetheless, any exhibition requires a level of authenticity which is provided through the physical artefacts in the exhibition space. This is why technology has a secondary supportive role and is used when it can add value to the exhibition concept; a balance that is often distorted with exhibition design being falsely seen as technology-driven. Quite simply, exhibition design is media independent and the pluralism of digital technologies offers a wide range of methods with the purpose of selecting the optimal one to convey the story.

Overall, in order to respond to the elevated role and demands of visitors, museums try to upgrade their experience by immersing them in the exhibition story and stimulating all of their senses (beyond sight). Considering the influence of storytelling and immersion on the way exhibits are presented and how integrated they are in contemporary exhibition design, it can be argued that they are the two defining features of museums' changed approach in exhibition design. This approach then departs from one-dimensional, sequential, passive learning to a more multidimensional, integrated, multisensorial one, which denotes a new path in exhibition design and spectatorship.

5.2 Role of collaborators in the creative process

The identified model emphasizes the involvement of multiple specialists during the different phases of the creative process. This showcases that the design and production of an immersive exhibition, or more accurately of any contemporary exhibition given the wide adoption of immersive techniques, does not concern solely the museum team anymore. The findings of the

study are in accordance with Davies's (2010) and Dean's (2015) description of the creation process as involving multiple disciplines.

More specifically, the findings suggest the interdependence of the role of curators and designers as the main stakeholders in order to create the final exhibition, similarly to Lake-Hammond's and Waite's (2010) research. Interestingly, the model of Lake-Hammond and Waite (2010) presents curators as the soles responsible for the concept creation, who together with designers work on the context of the exhibition and designers are responsible for ultimately creating the exhibition on their own. However, the identified model requires the input and close co-operation of both stakeholders throughout the process. Put differently, exhibition design now requires the combined efforts of multiple specialists during most of the creative process. This notion coincides with the understanding that a successful exhibition is the result of a balanced collaboration between curators and designers (Davies, 2010). For this reason, sub-steps depicting the need for an open flow of feedback and communication are present in all design and production phases. In a way, the findings indicate that the museum team is the client who the design and production partner have to please. At the same time, the museum team still preserves the control of the creative process since they are the ones who decide if the outcome of each phase satisfies them enough in order to give their approval to continue with the next design and production phase. Thus, it can be argued that the transition to a 'new museology' era (McCall & Gray, 2014), has been facilitated through the collaboration with external specialists to overcome the internal structural constraints, even though differences in the co-operation between the stakeholders can arise.

According to the data, there are tears of external collaborators who are incorporated for each different design and production phase. First and foremost, the principal design and production partner of the museum who participate in the creative process. During the design phase, for the conceptualization of the idea, it is important to consult the advice of specialists such as design researchers, writers, architectural designers, and spatial designers. Then for the operationalization and technical development of the exhibition space, the advice of production specialists is needed in addition to the collaboration with multimedia experts, other designers, art directors, architects, urban planners, experts on historic content, art content, and science content. Finally, throughout the production phase, production specialists, specialised agencies, multimedia experts, audiovisual hardware companies and even furniture building companies are selected to carry out the exhibition design. As a result, the proposed model accounts for how those specialists are integrated into the design and production process and more importantly what are the tasks of the design and production partner as well as their relationship with the museum team.

The necessity of interdisciplinary collaboration is evident. This is also widely acknowledged in a range of studies (Davies, 2010; Dean, 2015; Mygind, Hällman, & Bentsen, 2015, Olesen,

Holdgaard, & Laursen, 2018). Nonetheless, the proliferation of the roles required in exhibition design and production has been filled by external collaborators, and the museum team has not expanded to include all those new roles as it might have been expected. Consequently, the findings suggest that specialists from different disciplines temporally collaborate with the museum team during the different phases. Museums have always worked collaboratively, working together with artists to co-create exhibitions of their work or collaborating with other museums and lenders of artworks. However, incorporating external collaborators early on into the creative process who do not only bring the ideas of the museum team to life, but are actively involved in nearly all aspects of the design and production, marks a shift in the exhibition design and production process.

6. Conclusion

The purpose of the present study was to explore the design and production process behind the storytelling of immersive exhibitions. Put differently, this research employed the qualitative method of expert interviews in order to answer the following research question: *What is the design and production process behind the storytelling of immersive exhibitions?*

6.1 Main findings

The data analysis indicated five overarching phases of twenty-five total steps that constitute the process of designing and producing an immersive exhibition. The five phases, initial, concept, design, production, and opening provide a sequence of steps that clarify the activities of the creative process. Table 3 simplifies the identified model and showcases the key activities of each phase.

Table 3

Overview of key activities of the creative process

Creative process phase	Key activities
Initial phase	- Determine the content of the exhibition - Select a design and production partner to assist the process - Establish the 'facts' of the exhibition and communication between stakeholders
Concept phase	- Determine the exhibition idea and story
Design phase	- Conceptualize and operationalize the story - Collaborate with additional experts - Review design work
Production phase	- Collaborate with external specialists - Overview production activities - Produce the exhibition
Opening phase	- Open exhibition - Listen to visitors' feedback - Consider after-opening adjustments

However, it has to be acknowledged, that developing an exhibition in a real-life scenario might not always follow such a linear clear-cut process and that the same process might vary depending on the institution, its organizational structure, and the balance between well-defined tasks and informal daily activities. For this reason, the produced model identifies the creative process as an organized template where each phase is completed before the next one starts, but

the sub-steps allow for greater flexibility, creativity, and overlapping. Thus, the five phases summarize the main tasks and required roles, while establishing the flow of the overall process.

The identified process offers a detailed and expanded model that considers the contributions of new stakeholders, hence making the model a new addition to existing scholarship on the topic. It is important to note that the museum team might lead the process and ultimately have the final say, but the design and production partner's involvement is integral for the creation of an immersive exhibition since they are active actors who determine the end result as well. As the findings have demonstrated, the model exemplifies the dynamics of the collaborative process and points to the frequent communication between the two parties. Furthermore, the model also offers an in-depth look into the activities of both stakeholders and their intertwinement. Consequently, immersive exhibitions are the outcome of a two-sided process, which require the creative collaboration of both stakeholders who share responsibilities and look for the optimal solutions or sometimes compromise in order to design and produce an exhibition that satisfies all parties.

Additionally, through the study, the relationship between storytelling and immersion became clearer. In order to be relevant and produce appealing exhibitions, museums aim to create audience-centred exhibitions where visitors are engaged and participate in the story of the exhibition. Thus, storytelling provides the base for every creative process since every exhibition is a story. Immersion then is used as a mean to bring forth the story and enhance its inspirational and emotional aspect, while offering an additional multisensory layer that surrounds the art and helps visitors submerge in the storyline. For this reason, exhibition design is not technology-driven but story-driven and the varying digital methods are selected only to reinforce the storytelling and create an immersive environment.

6.2 Theoretical and social implications

Reflecting on the theoretical framework, the research findings validate certain concepts, while at the same time contribute to the emergence of different perspectives. First, the paper extends Carrozzino's and Bergamasco's (2010) research into immersive exhibitions and establishes the widespread adoption of immersion. In doing so, a broader shift in modern exhibition design practices is identified. Secondly, the present research reinforces the idea that modern exhibition design requires interdisciplinary collaboration, hence coinciding with the researches into participatory design by Davies (2010), Mygind, Hällman, and Bentsen (2015), and Olesen, Holdgaard, and Laursen (2018), but also offers an in-depth understanding of how this co-operation affects the creative process. It should be noted that the design and production model somewhat correlates with Dean's (2015) approach, as far as the identified phases of the creative process are concerned. Findings also showed that even though the creative process might require the

overlapping of activities, a certain sequence of steps is still maintained contrary to models that adopt a less linear approach (Davies, 2010). In addition, the findings contribute to academic discussions regarding the potential for storytelling to move beyond entertainment and fiction towards more 'serious' fields (Gabriel 2000; Lugmayr et al., 2017) and complements previous researches about the use of storytelling approaches in museums (Nielsen, 2014, 2017).

Furthermore, the research explores the relationship between immersion and storytelling and underlines the importance of the storyline in the design and production process. The findings also substantiate the researches of Barnes and McPherson (2019), and Wang and Lei (2016) about the role of visitors as co-creators, arguing the influence of visitors' needs in the creative process. Along the same line, it offers complementary findings to McCall's and Gray's (2014) research into 'new museology' by demonstrating the effects of the 'new' ideology and discourses around museums' role in the exhibition creation process. Finally, the study incorporates the accounts of experts outside the museum team who are usually overlooked, as it was expressed by Macdonald (2007), and provides detailed insights into the creative process as well as the co-operation between curators and designers which was requested by Lake-Hammond and Waite (2010).

The study corresponds to current discussions in the field about the changing role of museums and the need to create more socially relevant exhibitions, with the empirical findings offering a new understanding of modern exhibition design. Based on the accounts of the interviewed experts, immersive elements are employed in most contemporary exhibitions to engage visitors in a story that can have a greater impact on society, without losing their educational purposes in favour of entertainment. Moreover, the model provides insights into sub-processes that reflect the current practices and details a new interdisciplinary path in exhibition design. Indeed, the research combined and analyzed the accounts of experts outside the museum team, to reveal a collaborative model of the creative process. Therefore, the research can provide industry practitioners with a more in-depth look at exhibition design practices. As the range of experts involved in the design and production expands and new approaches in exhibition design emerge, the creative process is sure to change and adjust accordingly.

6.3 Limitations and suggestions for future research

While the study expands our understanding of the process behind the creation of immersive exhibitions, the findings need to be considered within the limitations of the research design. First and foremost, the scope of the study was affected by the scarce availability of experts and constrained in terms of the available time for its conduction. Therefore, the main limitation of the research lies in the small sample size of nine experts which hinders the generalizability of the findings. Thus, further research is required to validate the findings. The generalizability of the

model might also be limited due to the nature of qualitative methods. For this reason nonetheless: (1) the research design was revised along the process when deemed necessary for increased flexibility, (2) the viewpoints of the experts contributed to the diversity of the findings since they offered different scopes of operation and come from different backgrounds, and (3) to minimize the influence of the researcher and ensure the quality of the study, all decisions were thoroughly detailed, transparent, and supported by the previous theoretical framework. Despite these limitations, however, the findings inform current literature of the creative processes in exhibition design and production, showcase that immersive elements have come to be included in nearly all exhibitions, exemplify the role of immersion and storytelling methods in the creative process, and finally denote the close co-operation between various external collaborators who co-design the exhibition.

In addition, the experts were selected due to their ability to provide an extensive account of all phases of the creative process. However, it was established that an intricate web of collaborators is required along the design and production process. Consequently, it would be valuable to analyze the accounts of the rest of the collaborators given that the present study covered the point of view of only the two main stakeholders (the museum team and their primary design and production partner) and discover how they influence the identified model more explicitly. Furthermore, it would be useful to investigate the role of visitors as co-creators that might embellish current findings with additional insights and explore an aspect of the creative process that was identified in the present research, but was not examined in detail.

Most of the interviews were conducted with experts who are based and operate predominantly in the Netherlands. Accordingly, future research could investigate if the proposed model is valid in other countries and with a different mix of cultural institutions and companies as well. Finally, the study confined itself to identifying the creative process associated with creating an immersive exhibition whilst emphasizing the co-operative nature of the model, hence another avenue for research could concern the analysis and implications of the relationships between the many interdisciplinary collaborators.

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Appendix A: Interview Topic Guide

This appendix presents the topic guide that was used to guide the nine semi-structured expert interviews.

Introductory text:

My name is Zoi Popoli and I am enrolled at the master's program Media and Creative Industries at the Erasmus University in Rotterdam, the Netherlands.

First of all, thank you for taking the time and participating in this research. The aim of this study is to gain a deeper understanding of immersive exhibitions in museum and art spaces. For this purpose, the first section of the interview will ask you about immersive exhibitions and storytelling. Secondly, and most importantly, my thesis aims at understanding how immersive exhibitions are created. Therefore, the second half of the interview is dedicated on the process of designing and producing immersive exhibitions.

By engaging in this interview, you give me the consent to audio record and transcribe this interview for academic purposes only. Please note that the interview will not be anonymized, and the interview and the results will only be used for the purpose of this dissertation.

You are always free to interrupt the interview, ask for clarification or not answer any particular question, at any time during the interview.

Do you agree with everything that I just explained to you? Then we can start!

Opening questions

1. Can you tell me a little bit about yourself and your working experience?
2. Can you describe your function and duties in the organization that you are employed now?
3. What is your main objective when designing an exhibition?

Immersive storytelling in exhibitions

4. In your own words, how would you define immersion?
5. How would you define an immersive exhibition?
6. How about the storytelling of an exhibition?
7. What is the role of an immersive exhibition?
8. In your opinion, is the exhibition design changing towards a multimedia multisensory approach? Why? When did the process begin to change?

Design and production process

9. What are the main stages of designing and producing an immersive exhibition?
    i. Does the process differ from the design and production of non-immersive exhibitions? If so how?
10. Does the design and production process require collaboration with third parties?
    i. How has this affected the process?
    ii. How do you facilitate the process?
11. Has designing an immersive exhibition affected the required roles of the creative team? How?
    i. Has your own role been affected? If so how?
12. How has this affected visitors and their role?
    i. Are visitors becoming co-creators? If so how and why?
13. Do you see a change in the role of cultural institutions due to the new means employed in exhibition design? Why?
14. How do you respond to criticism relating to the potential loss of an exhibition's educational role?

Future of exhibition design

15. Finally, regarding the future of exhibition design, what are your expectations? Why?

Appendix B: Participating Experts

This appendix summarizes the details of the nine experts that participated in the research.

a/a	Name	Place of employment	Job title
Experts from cultural institutions			
1	Hedwig Wösten	Mauritshuis	Project Manager
2	Joep Heusschen	Youseum	Chief Operation Officer – Cofounder
3	Lucas Bonekamp	Stedelijk Museum	Head of Project Managers
4	Ronald van Weegen	Stedelijk Museum	Former interim Director
Experts from design and production companies			
5	Marco Ruzza	Jora Vision	Creative Director
6	Lisanne Buik	Independent	Multidisciplinary Artist & Designer
7	Łukasz Alwast	Stellar Fireworks	Chief Development Officer
8	Peter Slavenburg	NorthernLight	Director – Cofounder
9	Pepijn Wilbers	Studio Louter	Creative Partner - Managing Director

Appendix C: Coding Tree

The first table concerns the museum team and the second their design and production partner.

Selective Code	Axial Code	Open Code
Initial phase	Idea generation and formation	Initial idea
		Idea generation from a curator or artistic director
		Adopted idea from a co-production with another museum
		Seek outside inspiration for an idea
		Listen to suggestion of third parties for an idea
		Listen to visitors' input
		Idea that puts visitors at the heart of the exhibition
		Idea that confronts and challenges visitors
		Discussion of the idea within the curatorial staff
		Summarize the essence of the idea
		How the idea fits to the portfolio
		How the idea fits with the target audience
		How the idea fits with the story of the museum
	Internal team dialogues and initial reality check	Dialogue
		Peer review of the idea within the curatorial staff
		Communication within broader teams of staff and feedback (marketing and communication, development, curators)
		First 'go' for idea
		Give the green light to a project manager and curator to develop the plan
	Create and develop a project plan	Form project team to work on the plan
		Make a project plan of the exhibition
		Determine a story that brings across your message
		Determine the artefacts needed

		Determine and allocate the budget
		Determine the funding
	Reality check of project plan	Consider exhibition planning and mix
		Availability of budget, people, resources, space
		Check feasibility internally
		Check feasibility with board of directors
		Director's approval
	Carry out additional processes connected to exhibition creation	Marketing and communication process
		Loan of artworks process
		Funding and sponsoring process
		Educational additions and programs process
		Measures to accommodate larger crowds
		Co-creators of the exhibition: living artists, foundations
		Gradually broaden the teams to involve all museum departments
		Teams continuously work on the next process of the plan
	Write a brief and select a designer or company	Create brief containing the story, budget, look and feel, possibilities and limitations
		Find new designers from credit lines of other exhibitions
		Find new designers through connections
		Find new designers online
		Have (multiple) designers pitch their exhibition concept
		Pay designers to participate in the pitch process
		Select a designer based on their concept pitch and adjust parameters
		Assign the exhibition to a designer
Concept phase	Feedback and negotiations with designers	Ask for input and give advice on output
		Frequent back and forth conversations
		Communicate and work together with designers

		Have someone who is in charge of communicating and checking collaborators
		Incorporate external collaborators to the team
Design phase	Determine the specifics of the exhibition space	Details and conditions of the room: size
		Details and conditions of the room: lightning
		Details and conditions of the room: floor and routing
		Details and conditions of the room: colours
		Details and conditions of the room: walls or no walls
		Create a different feel of the space each time
	Determine mediums to visualize and conceptualize the story	Choose mediums that explain and deepen the story
		Multimedia use when it is in favour of the art
		Consider limitations of space in the use of multimedia
		Multimedia or analog mediums that add value
		Be consistent and continuous with the mediums used
		Different ways to transfer the message increases memorability
	Review design work	Design brings forth the story
		Design gives weight and meaning to the story
		Design gives a feel to the exhibition
		Design gives an extra layer to the art
		Design does not distract
		Design jokes
		Design that pleases visitors' desires
		Design that facilitates visitor's participation
		Design that facilitate digital sharing
		Design for your target audience
Production phase: implementation,	Exhibition production and installation	Start building
		Make adjustments during production

production, and installation		Collaborate with production company and builders
		Write the information shown in the exhibition
Opening phase: review and optimization	Pre-opening arrangements	Establish a team that handles technical aspects once the exhibition opens up
		'Rehearsal' of the exhibition
		Have a team responsible for opening night
		Invite sponsors and members
	After-opening adjustments	Listen to visitors' feedback and make adjustments if needed

Selective Code	Axial Code	Open Code
Initial phase: interpret brief and establish the 'facts'	Client's briefing and definition of exhibition goal	Receive brief from client
		Define the goal and 'facts' of an exhibition
	Re-interpretation of the brief	Translate the brief to establish a common language/denominator
		Interpret the brief to be realistic
		Interpret the brief to be realistic budget-wise
		Define the balance between education and entertainment
Concept phase	Pre-concept research and estimations	Client's unclear exhibition vision
		Emotion design
		Explore the why and what
		Explore the relevancy and the meaning
		Explore the 'emotional genre'
		Conduct research
		Initial feasibility, cost and competition study
		Consult the advice of specialists
	Exhibition design idea and story creation	Brainstorm on ideas and physical aspects of the exhibition
		Storytelling as the starting point to define the experience
		Make a story that visitors can connect with and has meaning
		Decide on a concept (story) that fits the why, the what, and the

		target group
		Originate a big idea: values, emotions, limitations
		Determine the narrative of a big idea
		Determine the functional side of a big idea
		Determine the emotional side of a big idea
	Presentation and approval of exhibition design idea and story to client	Present the outcome of each process step
		Agree, sign off and move on
		Get client's approval on the big idea
Design phase	Conceptualization of the idea and development (concept design)	Translate story to a realistic concept
		Sketch design: make an interconnected map of the exhibition journey
		Exhibition map: assign emotions to rooms
		Exhibition map: assign themes to rooms
		Exhibition map: assign objects to rooms
		Adjust to the capabilities and limitations
		Role and characteristics of space
		Role of the senses (create synaesthesia)
		Design the echo system and additional services around the exhibition
		Determine what each room will be
		Determine the means required to visualize the story: material, media, decoration, interior design elements
		Determine the floor plan
		Determine the routings
		Determine visitors' role
		Determine the feel and atmosphere
		Write down the storyline
		Interaction design for multimedia

		Consult the advice of specialists: design researchers, writers, architectural designers, spatial designers
	Operationalization and technical development of the exhibition space (schematic design)	Detailed design and pre-production
		Make a synopsis of each exhibition space: emotion, story, concept, story elements
		Use drawings, text and 3D renders to visualize the exhibition design
		Resource and budget: calculate, check and adjust
		Consult the advice of production specialists
		Collaborate with experts: multimedia, other designers, architects, urban planners, experts on historic content, art content, science content
		Collaborate with an art director to coordinate
	Client & partners communication and monitoring	Meetings with external partners
		Communication with all partners
		Meet client's deadlines
		Back and forth negotiations
		Client's check of the process
	Design work (final design)	Definite design: define the details
		Create scenarios and sketches of the definite design: scripts, mood board, key note
		Create packages of design work for the client
	Presentation of the final design to the client	Present the outcome of the each process step
		Agree, sign off and move on
		Get client's approval on the final design
Production phase: implementation, production, and installation	Engineering	Technologically feasible
		Preparation of engineering and technology
		Collaborate with production specialists: production agencies, multimedia experts, audiovisual hardware, furniture built

		Supervise the process
		Tender the production and select the optimal bid
		Expand teams to execute the design
	Production offsite	Technical development of production props
		Produce media
		Collaborate with specialists
		Expand production team
	Installation onsite	Combine all parts of the exhibition
		Check functionality and make adjustments
		Soundscape the exhibition room
		Collaborate with specialists
Opening phase: review and optimization	Pre-opening arrangements	Prepare for the opening
	After-opening adjustments	Soft opening test
		Track visitors
		Make improvements