

BEYOND THE MUSEUM: LEADERSHIP EXPERIENCES FROM VR PRODUCTION STUDIOS

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ABSTRACT

As digital technologies evolve at an exponential speed, the digital art scene has become ever more vivid in the past decades, with various forms of collaboration emerging between art museums, artists, curators, and audiences. While these collaborations are celebrated for their potential mutual benefits, such as knowledge exchange and the legitimizing effects on artworks, art museums struggle to maintain their relevance, and for this reason museum leadership has been deemed of critical importance. Historically, museum leadership has steered art museums through paradigm shifts using two approaches, namely, individual and relational. Nonetheless, the motivations for choosing these leadership approaches and their effects on guiding art museums into digital art remain unknown. In this study, we explore leadership approaches that contribute to museum-studio collaboration on the creative output of digital art by tracing one of the enabling actors: creative studios. We choose this focus to understand how studios carry out the production and distribution of digital art in a collaborative setup. Through short ethnographic studies of two Copenhagen-based VR art creative studios: Khora Contemporary and MAKROPOL, we argue that the choice of leadership approach in VR art production and distribution is contingently motivated by either market or knowledge-oriented views of digital art. Consequently, contemporary art museums have the potential to become platforms that carefully negotiate ethical and contextual implications in leading digital art projects at the intersection of market and knowledge-driven agendas.

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INTRODUCTION

Today, emerging digital technologies such as Virtual Reality (VR) have inspired new forms of artistic expression and visualization (Graham & Cook, 2010, p. 5; Paul, 2008a). These new art forms, which are created using digital technologies and “display any or all of the three behaviors of interactivity, connectivity and computability in combination” (Graham & Cook, 2010, p. 10), are often placed under the category of digital art (Bentkowska-Kafel et al., 2005; Paul, 2008a, 2016), or new media art (Graham & Cook, 2010).¹ Subsequently, existing contemporary art museums like the Whitney Museum of American Art in New York, U.S., successfully transformed themselves into leading agents of digital art (Chatel, 2019). Dedicated digital art museums also started to surface, such as ZKM Center for Art and Media established in 1997 in Karlsruhe, Germany, or the more recent *Borderless*, created by the collective teamLab in 2018 in Tokyo, Japan.

Meanwhile, challenges in curating digital art persist (Graham & Cook, 2010) due to a potential mismatch between the interdisciplinary, interactive, and collaborative qualities of digital art, and the prevailing curatorial model that focuses on displaying and archiving art “objects” (Rubio, 2014; Parry, 2013; Graham & Cook, 2010; Peacock, 2008; Paul, 2016; Rottenberg, 2002; Paul, 2008b). Such mismatch calls for the examination of existing criteria for selecting, equipping, and training curators and other museum professionals (Graham & Cook, 2010; Paul, 2008a, 2016), and calls leadership in art museums into question, asking in particular *how can museum leadership maintain the relevance of the contemporary art museum in the evolving digital art scene?*

In this study, we pursue our inquiry by zooming in on Virtual Reality (VR) art as an emergent form of digital art. Through a brief review of the development of VR art from the 1990s till now, we demonstrate that there has been an increasingly blurred line between artists, technologists, and audiences in the production and exhibition of VR since its early days, and new working relations between artists, creative studios, and museums regarding education about and distribution of VR art. As much as art museums benefit from these new collaborations with creative studios, a closer examination of the curators’ reflections on their own roles in digital art reveals that art museums still face challenges in coping with the changing archetypes of curation in a collaborative setup, and require intervention from museum leadership. While existing leadership approaches (i.e., individual and relational) that have helped to steer art museums through paradigm shifts (Caust, 2018; Cray et al., 2007) can potentially contribute to the transition, it is not clear what the motivations for museum professionals are when choosing a specific leadership approach to VR art production and distribution, or how museum leadership may approach their collaborations with creative studios in particular.

Our study therefore explores motivations for leadership choices, know-how, and museum collaborations with creative studios in the context of VR art, through two short ethnographic studies of the Copenhagen-based VR art creative studios, Khora Contemporary and MAKROPOL,

and their interdisciplinary collaborations on VR art productions. Focusing on creative studios helps to re-place the museum as a “node” in the network of digital art, providing an account of the relevance of museums to society and for the communities around them (Anderson, 2004), as seen from the point of view of the other. Tapping into the collaborations these two studios have with artists, developers, galleries, audiences, and museums, we have identified two modes of VR production and distribution, each with its own unique leadership approach. These leadership approaches were particularly motivated by the studios’ vision and drive for pursuing VR art, such as market competition and knowledge production, which share similar influences with the ongoing museum paradigm shifts.

Based on our findings, we argue that museum leadership in the age of digital art encompasses not only museum directors, but also museum professionals such as curators, technologists, and exhibition designers, who are involved in the production and distribution of digital art and whose roles are often emergent and adaptive. Museum professionals, when engaging in digital arts projects with creative studios, need to reflect on their own and other actors’ motivations for producing and distributing digital art, and carefully identify which leadership approach fits best. The contemporary art museum may be particularly relevant with regard to critically approaching how audiences are invited to explore digital art, not as consumers, but as participants and interpreters who are both critical of and vulnerable in such explorations. With regard to how art museums approach creative studios, our study serves as a starting point, inviting museum professionals to reflect on how museum leadership can ensure that contemporary art museums do not become overshadowed as venues and collaborators, by tracing the history of digital art and providing three dimensions to consider: the changing nature of the museum; knowledge about the forms of digital art that museums work with; and how audiences and technologies are involved and considered.

BACKGROUND

Virtual Reality Art

In recent years, there has been a growing interest in VR art as an emergent art form. Among other technologies explored in art since the early 1990s, VR is a particularly interesting medium. VR technology was first explored in cinema and military simulations: first with Morton Heilig’s Sensorama in the early 1960s, and later with Ivan Sutherland’s head-mounted display – which was used in night landing experiments by U.S. military pilots (Grau, 2003). Already in these first attempts, VR was motivated as a way to expand existing art forms like cinema and theater, and born out of the interdisciplinary complex between art, military research and industry.

Like other site-specific art forms such as installation art, the exhibition of VR art *is* the artwork, rather than it being simply a form of display (Graham, 2016, p. 575). This has been the case since the first VR exhibitions in contemporary museums, such as Canadian artist Char Davies and her

work *Osmose* (1995) at the Musée d'art contemporain de Montréal, and later *Ephémère* (1998) at the National Gallery of Canada (Grau, 2003). These artworks involved solo experiences in which a participant navigated a virtual space through a head-mounted display and a data-vest that monitored his or her breathing and balance (Davies, 2004). The works were presented as a carefully designed installation, where physical and virtual elements, including museum staff and audiences, constituted the work. With staff assistance, audiences were guided to navigate the work within the exhibition and participate actively in the installation. In this way, VR art was first explored as *interactive* and participatory work dependent on site-specific installations and protocols, which guided museum staff into how to present the work, guide audiences and collect their feedback (Grau, 2003).

From its early days, the creation of VR art had already involved interdisciplinary teams, which were led by an artist's vision and constituted by the combination of crafts. For instance, when Davies, who was originally trained as a painter, created *Osmose* and *Ephémère*, she was the art director of a software company called *Softimage*, and led a small interdisciplinary team working with three-dimensional image production, programming, sound engineering, protocol and exhibition design, and the calibration of sensors and a head-mounted display (Immersence, 2021).

Over the past decade, we have observed an increasing commercialization of cheaper and improved versions of VR software and hardware (Matney, 2020). With the arrival of a wide variety of VR devices, artists and museums are exploring the technology as an art form in exhibition contexts *once again*. The development of recent educational programs exploring digital art has led to new generations of artists that can take on different roles in the production of VR art. A multimedia artist today can be the art director, programmer, sound designer, and exhibition manager of her own VR works. An example is *Touching a Cactus* by Sarah Rothberg (Rothberg, 2020). The revival of VR as an art form has also given rise to the emergence of creative studios dedicated to VR art such as Acute Art or Khora Contemporary, and led to new collaborations between artists, industry partners and museums, as well as VR-specific exhibition formats. Contemporary art museums are increasingly partnering with creative studios that are exploring VR, such as the New Museum's VR exhibition app "First Look" made by the studio Rhizome and the cloud service EVVO (*EEVO*, 2020), or the pop-up exhibition hosted at the National Gallery of Denmark showing the work of a local VR studio, Khora Contemporary (Khora Contemporary, 2018a).

Challenges for Art Museums

For art museums, emergent collaborations with artists and creative studios on digital art such as VR art are mutually beneficial (Graham & Cook, 2010). VR artists and creative studios can get the "seal of approval" (p. 190) by exhibiting at a museum. Museums can partner with studios that have the expertise and resources to realize sophisticated technical exhibitions. Nonetheless, art museums also face challenges in these collaborations, including questions about the "right"

expertise required in curation, the role of curators, the process of curation and the legitimizing power of the art museum.

Conventionally, art museums are accustomed to prevailing models of curation, exhibition, and documentation of the traditional art “object”. It is therefore common for the curator to have expertise in various art-related fields, such as art history, art administration, or conservation. In dealing with digital art that is process-oriented and participatory, other expertise, such as design, programming, or media theory, is also needed to inform the curator’s interpretation, participation in and presentation of the artwork (Graham & Cook, 2010). As the expertise required in curating digital art diversifies, the role of curators also becomes more distributed. Today, museum curators do not only select, collect and document artworks, they may also engage in the production and management of digital art projects, where the roles of curator, artist, engineer/technologist and audience may be blurred (Paul, 2008b). In turn, curation can also go beyond the individual curator. Curatorial activities are observed not to be confined to curators, but distributed across the boundaries of departments, institutions, fields, and even to the audiences, like the role museum staff played in Davies’ VR works (Graham & Cook, 2010).

Producing digital art collaboratively also has implications for the process of curation, for instance, as the traditional divide between production, exhibition and distribution becomes increasingly blurred. The exhibition of digital artwork as a participatory event can be the art itself, or inform the development and completion of digital artworks, like the *QUID PRO QUO* (2020) VR dinner performance by MAKROPOL, where the artists investigate what can potentially constitute a work of art, and “where food, virtual reality and performance merge into a ceremony (MAKROPOL, 2020b)”. In this way, audience studies and exhibition histories are particularly valuable in informing the curators’ understanding of digital art.

Moreover, as dedicated digital art spaces, galleries and festivals emerge, and digital art such as VR art enters the mainstream art market (Schuir et al., 2020), the power of art museums to legitimize emergent digital art is also shifting to other actors. Traditionally, the source of art museums’ power in approving artworks is largely rooted in their collections (Graham & Cook, 2010, p. 202). As art museums lag behind in finding the appropriate forms for collecting and historicizing digital art, alternative venues for digital art may thus take on the role of legitimizing digital artworks, overshadowing the relevance of the contemporary art museum.

In light of these challenges, the relationship of the actors within such collaborations has been deemed critical to the realization of these potentials (Graham & Cook, 2010), and leadership is seen as key to managing these relationships (Griffin, 2003).

The Leadership Approaches of Art Museums

In recent decades, museum leadership has played a key role in responding to the museum paradigm shifts of the 21st century, from government-funded to market-oriented (Rottenberg, 2002); from

collection-driven to visitor-centered and knowledge-driven (Anderson, 2004); and from elitist to “cultural institution(s) in service to the public” (Anderson, 2004, p. 1; Silverman, 2005).

More specifically, as a result of reduced government grants, art museums have experienced fundamental changes in their structures, procedures, and management, leaving them more dependent on donations from individuals and corporations, income from performances and exhibitions, and the efforts of volunteers (Cray et al., 2007; Griffin & Abraham, 2000). This new reality demands attention from art museum leaders, such as museum directors, who need to cope with a wide range of responsibilities, such as the increasing need to focus on managerial as opposed to artistic or aesthetic issues (Cray et al., 2007; Sicca & Zan, 2005).

In search of ways for museum leaders to adapt to new financial models, responsibilities, and organizational structures, and ensure the sustainability of art museums when confronted with such changes, research on art museum leadership has primarily focused on the roles and skills of the individual leader (Griffin, 1987). For instance, with cuts to government support and dependency on external funding, museum directors are regarded as important agents of change; their roles are discussed in relation to their official management responsibilities regarding fundraising and public relations, as well as maintaining cohesion between staff (Anderson, 2004; Griffin, 2003). Among these literatures, there is a tendency to focus on the individual attributes of leaders, such as individual passion for art and their preferred leadership styles (Suchy, 2004). Understanding the desired skills, values and behaviors of individuals in traditional leadership roles such as that of museum director, is crucial in order to manage change in art museums. This is due to the leader’s relevance as an employee who is securely positioned in an enforced organizational hierarchy, and who has centralized authority to bring order to organizational discord (Cray et al., 2007).

Another form of leadership observed in art museums is dual leadership (Bruch, 2011; De Voogt, 2006); an artistic director assumes responsibility for artistic excellence or visitor experiences, while a managing director, or general manager, is responsible for business operations and financial sustainability (MacNeill & Tonks, 2013; Reynolds et al., 2017; Stein & Bathurst, 2008). While some scholars continue to focus on the skills, values, and behaviors of individuals in these two leadership roles, these forms of shared leadership have led other researchers to understand leadership from a relational perspective (Caust, 2010; Reynolds et al., 2017).

In comparison with the individual approach which emphasizes the individual leader’s formal role and responsibility, and the effect of their ‘heroic’ actions on the performance of art museums, the relational approach places emphasis on art museums as a place for knowledge and resource exchange between different actors; hence, the roles of leaders and followers are interchangeable (Caust, 2010). Leadership, in this sense, is regarded as a collective and dynamic social process that emerges through the interactions of multiple actors in the art museum; it is characterized by shared agency and emergent practices that are distributed throughout the organization, depending on who are the “experts” or “knowledge bearers” at a particular point in time (Caust, 2010, p. 578).

Understanding leadership from a relational perspective is relevant for managing change in art museums, which are increasingly knowledge-driven and public-oriented, and also for instances where there is greater involvement with a wide variety of stakeholders and collaborators, and an increasing exchange of knowledge and resources.

While individual and relational leadership approaches offer different insights into managing change in art museums, their effects in practice remain contingent on specific organizational configurations: divergent forms of leadership may not always harmoniously fit in already existing organizational structures. For instance, although some researchers reported sustained shared goals and interdependence in shared leadership (Järvinen et al., 2015; Reynolds et al., 2017), some have pointed out the presence of conflicts related to funding, due to the potential contradiction and competition between the drives of artistic creativity and financial sustainability (Auvinen, 2001; Landry, 2011). In this sense, leadership is hardly a “one size for all” to cope with change (MacNeill & Tonks, 2013). Rather, it requires scrutiny to understand how organizational change shapes leadership approaches in practice and in specific contexts (Caust, 2018).

Existing leadership studies suggest that the choice of leadership approach in art museums is often motivated by the art form curated (Lapierre, 2001). Empirical studies have demonstrated that different art forms (e.g., performing arts, visual art, literary art, and new media art) may require different leadership approaches due to their divergent production processes (Caust, 2018, p. 70). In the case of digital art which draws from interdisciplinary expertise, we believe understanding collaboration with small creative studios, in particular, can provide inspiration for context-specific prototypes of leadership approach.

CASE SETTING AND METHOD

We found our case studies when we attended a networking event in Copenhagen for VR professionals. During the event, we realized how the participants, despite working with similar technologies, seemed to draw from different agendas and sources of inspiration when presenting their work. Two studios, Khora Contemporary and MAKROPOL, particularly caught our attention. Khora Contemporary was presented as a for-profit producer and curator of exhibitions, while MAKROPOL was introduced as a non-profit experimental and research project at the intersection of technology innovation, performance and cinema. The two studios, as important actors within the development of VR art and exhibitions in Denmark, take different approaches to producing and curating VR art, which involve museums to different extents.

Khora Contemporary

Khora Contemporary is a for-profit, VR and augmented reality (AR) art production company, with offices in the meatpacking district in Copenhagen, Denmark. It is a joint venture between Khora ApS – a Danish VR and augmented reality production studio, and the Danish contemporary art institution Fauschou Foundation, which focuses on acquiring works of contemporary art for its

private collection, and organizes museum-quality exhibitions internationally (Faurischou Foundation, 2019). The ambition of Khora Contemporary is “to establish virtual reality technology as a widely applied media within the art, becoming the virtual reality art production company of choice in the art world” (Khora Contemporary, 2020). The team behind Khora Contemporary consists of six permanent leadership positions, as presented on its official website, in addition to the staff working at Khora ApS that consists of an average of 23 employees. In *Figure 1*, we illustrate the organizational structure of Khora Contemporary, based on the available information about the studio on its official website as well as public information about the company (Virk, 2020a), in addition to initial dialogue with the art director (Personal Communication, December 2019).

< Place Figure 1: Visual Representation of the Organizational Structure of Khora Contemporary approximately here >

As illustrated in Figure 1, Khora Contemporary is staffed by both permanent employees (represented by squares) and temporary collaborators (represented by circles). The permanent employees are the founders, art directors, partners and programmers, some of whom are shared between Khora ApS and Khora Contemporary. The shared employees are the outcome of the working relations between Khora Contemporary and the two parent organizations (marked with bold outline), Khora Aps and Faurischou Foundation, with regard to exhibiting works. The temporary collaborators are those hired for a particular exhibition or production. Khora Contemporary debuted in Faurischou Foundation’s exhibition *New Media (Virtual Reality)* at the Venice Biennale in 2017 with two major commissions: Christian Lemmerz’s *La Apparizione* and Paul McCarthy’s *C.S.S.C. Coach Stage Stage Coach VR experiment Mary and Eve*.

MAKROPOL

At the other end of the meatpacking district, we found MAKROPOL’s offices. The studio presents itself as a non-profit, extended reality (XR) studio that experiments with various technologies, including VR and artificial intelligence. Founded by a Danish film producer, the studio relies on both public and private funding, including art foundations and innovation-related partners, as its primary financial sources for production. The mission of MAKROPOL is to “be the leading XR studio in the Nordics and lead the way for a sustainable cinematic XR industry” (MAKROPOL, 2020a).

The studio consists of seven permanent employees, including two producers, one creative technologist, one XR director, one sound designer, an industrial PhD, and a visual effects specialist. As part of MAKROPOL, the founder and lead producer have a long-standing collaboration with an art director², and a range of artists, exhibition staff, and external technical professionals. In Figure 2, we visualize the organizational structure of MAKROPOL with available information

about the company (MAKROPOL, 2020a; Virk, 2020b), and personal communication with the lead producer and art director (Personal Communication, January 2020).

Even though the studio has a small group of permanent employees, some projects have allowed the lead producer to hire more people for particular projects. For instance, when creating the installation *ANTHROPIA*, a 400 m² VR experience exhibited at the art center Copenhagen Contemporary in 2017, MAKROPOL's project team expanded to approximately 50 employees. The team included temporary exhibition staff and external technical professionals (Personal Communication, January 2020). In 2019, MAKROPOL partnered with an industrial PhD student who received a scholarship funded by two Danish foundations, the Nordisk Film Fonden and the Danish Innovation Fund. PhD student Camilla Jaller, affiliated with Aalborg University in Copenhagen, has since conducted empirical studies on cinematic embodied storytelling. Her research informs the works and shows produced by MAKROPOL. She conducts qualitative studies in which MAKROPOL's staff, and their audience, are invited to participate. In particular, Jaller has been working on audience research for their most recent piece, *Martyr*, a dinner performance combining virtual reality, participatory performance, and gastronomy.

< Place Figure 2 Visual Representation of the Organizational Structure of MAKROPOL approximately here >

Data Collection

In order to better understand VR art production in these two studios, we used three data collection methods including 1) participant observation, 2) semi-structured interviews, and 3) archival materials. These methods, in combination, are an example of a short-term ethnographic engagement (Pink & Morgan, 2013). Through these approaches, we compare the studios' VR art production practices across different platforms (online, at networking events, and at exhibition spaces) and their publicly available narratives, allowing us to do multi-faceted storytelling around their VR art production and leadership approaches. An overview of our data resources can be found in Table 1. More specifically, we first conducted participant observations to gain an overall impression of the VR artworks produced by the studios, their exhibitions and the networking events in which representatives of the studios participated. Our observations took place at three different sites: an exhibition showing the studios' work in parallel in 2017, a networking event in 2019, and a testing event for an artwork produced by MAKROPOL in 2020 (see Table 1). These engagements also revealed how the studios' directors and collaborators present their work in different contexts and to different audiences (art professionals in contrast to exhibition audiences). Through semi-structured interviews with the employees of the studios, we further investigate the roles and dynamics around VR art production in each studio and within different kinds of collaborations, which paves the way for us to understand each of their leadership practices respectively. In total, we conducted three semi-structured interviews with four employees (see the details about informants in Table 1 and the interview question examples in Table 2). In parallel,

we also collected online material available on the two studios' websites in which they portray their productions, team behind their productions and their collaborators, in order to understand their organizational structures, missions, and visual communication. Through archival material, we were able to unveil different ways of framing and formulating their teams and their work processes, supplementing our understanding of the processes around VR art. These collections of material help us to delineate what a creative studio working with VR art looks like, and better understand how each studio positions their work, expertise, collaborators and value proposition.

<Place Table 1 Data Collection Overview approximately here>

< Place Table 2 Sample of Interview Questions approximately here>

Data Analysis

Our data analysis follows a grounded approach to our empirical materials. The analysis took place in two main steps. First, we started with an iterative series of open coding in parallel to data collection. When coding our materials, each author coded the interview separately, and we met on a weekly basis to compare the coding results. The archival materials, such as the videos on the studios' websites, were analyzed jointly by the authors, and resulted in memos that were further used for coding. For instance, we paid particular attention to how technology was portrayed in the videos selected and how the process of art creation was visualized, asking: Who/what is visible in the videos? Who/what leads the narrative? And who/what is left in the background? Through the first step, we identified three open codes: "views of technology", "views of art" and "views of leadership".

Consequently, we proceed to contrast the open codes with our literature review, which helped us to zoom in on how leadership was framed and formulated in the material and how the museum emerges in this material. This second process led to the crafting of more focused codes in order to detail the patterns of VR art production and their links to museum leadership. To exemplify this process, we visualize our process below in Table 3 with a sample of our codebook.

<Place Table 3 Example of the Codebook approximately here>

FINDINGS

In our various encounters with Khora Contemporary and MAKROPOL, two modes of VR production and distribution emerged, each with its own leadership approach. These leadership approaches were particularly motivated by the studios' views of VR art, which reflected their specific drive for pursuing VR art, namely, market competition and knowledge production. These differing drives behind the production of VR experiences provoke questions for museum

leadership, as they may have to navigate divergent views of digital art, but also divergent configurations of leadership and motivations for producing digital art.

Khora Contemporary

Khora Contemporary makes an interesting case for understanding the processes around VR art as an emergent form of digital art, thanks to its unique position as a joint venture between a VR production company and a contemporary art institution. This relation points to a complex landscape that intersects between market, technology and art, as well as across curatorial processes such as selection, production, distribution and collection, and which requires careful navigation. In this case, we zoom in on how Khora Contemporary navigates the complex landscape that surrounds VR art, first by distinguishing the different views of VR art within Khora Contemporary, and then unfolding how such views link to their production and distribution modes, as well as how museums are implicated accordingly.

Establishing VR as an art medium and commodity

From reading Khora Contemporary's mission - "to establish virtual reality technology as a widely applied media within the art" (Khora Contemporary, 2020), it seems that their idea of VR art is characterized by a sense of "newness", even though VR has been used as a medium in art since the early 1990s. Indeed, the narrative of VR as a "new medium" in art recurs throughout the promotional materials of Khora Contemporary (Khora Contemporary, 2018b). This sense of "newness" is largely associated with the technical attributes that are "unlike physical works", "easy [...] to exhibit", and "don't have shipping costs and insurance costs" (art director, personal communication, December 2019).

While VR is considered a "new" commodity that can create a lot of excitement in the art market, it can also pose challenges as its relevance to contemporary art is yet to be recognized. The quality of VR productions as art is still not established. For instance, in the art director's account of distributing VR artworks, she mentions:

We assumed that the work would be naturally assimilated into the art market, but what we realized is that when you're dealing with something new, people have a hard time understanding its relevance, or coming on board, or having the courage to put themselves out there and show a new medium (Khora Contemporary's art director, personal communication, December 2019).

In order to establish VR as an art form in contemporary art (Khora Contemporary, 2018b, 3:30), seeking approval through distribution and collection of the artworks in art institutions becomes an important task for Khora Contemporary's art director. As she explains:

The work [of Khora Contemporary] is really focused more and more on distributing the work [of the artist], making sure that it's exhibited in the right institutions, and good institutions. Being shown to the highest possible quality, being placed in collections (art director, personal communication, December 2019).

Producing VR art

With that said, Khora Contemporary considers VR technology and other new technologies simply as tools for artistic expression, which are secondary to “art history and the whole historical legacy that came before them” (art director, personal communication, December 2019). This view implies that VR artwork consists of two inter-connected parts: 1) an abstract artistic vision that is the property of an artist; and 2) an artefact that is “brought to life” by an artisan – in this case a VR developer:

[Khora Contemporary] tries to faithfully [...] recreate the concept that the artist has in mind in the medium, and tries to find a way to [...] produce as loyally as possible what they had in mind (Khora Contemporary’s art director, personal communication, December 2019)

Following this view, there also seems to be a clear division of labor in VR art production between artists, artisans, and directors. Artists are seen as the primary source of the artistic vision in VR art productions, thus they are in charge of decision-making in conceptualizing and materializing the artwork during the production process. Artisans, who are highly skilled, follow the given artistic vision and the artist’s decisions in the production process. And the directors of Khora Contemporary become the interface between the artist and the artisans, bridging their views and opinions, as explained by the lead producer at Khora Contemporary in a video interview made by an art platform:

We want to provide the technology to them [the artists], in a way that they can use it. Use us more as a tool or a paintbrush – not necessarily that we are taking over building the works for them, but they are using us to create their ideas (Cobo, 2017, 2:24).

This mode of art production is compared to a traditional Renaissance studio, where there is a leading artist like Caravaggio, and the developers are the skilled painters that follow the leading artist:

In essence, [...] the developers are part of the team, but [they are] not necessarily leading the conversation. I mean, it’s the artist’s vision. So, the developer is kind of, I’d say, like a hand of the artist. And then in the same way that in the traditional Renaissance studios Caravaggio perhaps needed a team of painters, the painters were there to facilitate his vision (Khora Contemporary’s art director, personal communication, December 2019).

In this account, the artist's concept or idea for the production weighs more than the craft and skill of the developers, who become tools of the artist, rather than the creators of the artwork.

Distributing VR art

With the aim to become “the virtual reality art production company of the choice in the art world”, Khora Contemporary has to establish VR art as a “new” category of commodity in the art market. Nonetheless, distribution is anything but an easy task. Rather, it requires careful contemplation of roles, stakeholders, distribution channels and formats.

For Khora Contemporary, distributing VR art and VR skills as a commodity in the art market largely builds upon the nascence of VR technologies. This means, prior to production, Khora Contemporary's director needs to act as a scout for new VR technologies and manage Khora's relationships with tech companies in the field. This also means frequent involvement in VR conferences and festivals as spaces for networking and distribution. As explained by the art director:

I'm very much involved in the digital arts, specifically in the VR art scene. So, I'm aware of most of the institutions that are working with the medium, most of the artists that are working with the medium, and constantly getting in touch with artists to view new work. What I really have to make sure is that I've seen all the new work that's coming out [...] just so that I'm aware of what the latest technical possibilities and capabilities are, and also that we can inform artists about interesting references (personal communication, December 2019).

In this way, Khora Contemporary accentuates its unique position in the art market as a VR art production studio which helps artists to match their artistic vision with Khora Contemporary's technical capabilities. Once production starts, distribution of VR art becomes a collaborative process between artists, their contracted gallery and Khora Contemporary. The directors of Khora Contemporary become agents of the artist, providing advice about financial matters and the market prospects of the artwork. In doing so, they establish and manage a partnership between the artist, the artist's gallery, and the studio. As the art director of Khora Contemporary explains during our interview:

We play the role somewhat of a VR art gallery. And in the manner of a gallery, we advise artists on financial matters and how we envisage selling the work. [...] A lot of the business side of art is taken on by the gallery. That's what they are compensated for. That's their role. So, in the same way, we do a lot of that work and we also work with the artist's gallery (Khora Contemporary's art director, personal communication, December 2019).

Relevance of the museum

When asked about the art museum as a venue or collaborator, the art director referred to museums as “high-quality institutions” that can approve the status of Khora Contemporary’s works as art. Having said that, museums are increasingly overshadowed by galleries and art fairs, which are inherently commercial and can have direct impact on the studio’s market-oriented agenda.

Museums of various types also seem to be potential collaborators for creative studios like Khora Contemporary, in light of their recent efforts to attract the public via digital experiences. For instance, the website of Khora ApS, the parent company of Khora Contemporary, lists a series of collaborations with museums (Khora, 2021). A large majority of these projects are commissioned by museums and tourist agencies to create digital experiences around an existing artwork. Although one of the projects involves a contemporary art museum (The “Fall of the Titans” project at the National Gallery of Denmark in 2020), the VR work itself is often not categorized as artwork.

Overall, in its efforts to establish VR technology as an art medium and VR art as a new art commodity, we observed that Khora Contemporary often juggled between different roles and actors in these processes. Nonetheless, the roles of each actor are to a large extent discussed, entrenched early on, and enforced through contracts or agreements prior to the initiation of a project (Khora Contemporary’s art director, personal communication, December 2019).

Museums play two separate roles in the production and distribution of VR art. While art museums retain their role as “high-quality” exhibition venues for distributing and approving VR artworks, museums are in general also potential project collaborators, or clients, that commission work to create VR experiences. Rather than simply playing an active role in influencing the establishment of VR art as an art category, the relevance of the museum also lies in promoting the role of VR technology, and the studio, in attracting audiences to cultural spaces.

MAKROPOL

What we found particularly interesting in the case of MAKROPOL, is how the lead producer founded the studio as a mixed reality studio that focuses on the audience’s cinematic experience by exploring storytelling with different digital technologies. This particular focus gives rise to a view of VR as a medium of artistic expression that is largely integrated in the artistic forms of film and theater. Each VR art project becomes an important source of knowledge. Such a view of art and technology gives rise to a different way of organizing VR productions, which is largely contingent on the concept of the project, the configuration of collaborators, and the technology that is being explored. Working with film and theater in such a way also has implications for what kind of leadership approaches are taken.

Establishing XR art as exploration of individual and collective artistic visions and knowledge

What became clear during our interview with the art director and producer of MAKROPOL is that XR art is essentially about the exploration of experiences and emotions, and is largely driven by artistic vision. In this sense, technology such as VR is an integral part of the artistic vision as a subject of exploration, rather than a necessary component. For instance, the art director explains how his emotions guide his use of technology:

I have to make them [technologies] intimate... Otherwise, it's just something cold and dead, that becomes an obstacle, right? I'm very old-fashioned in a way. I'm a romantic, because what drives me are the emotions, always the emotions. It's always the story. I don't really care about technology. No [...] the minute technology becomes an obstacle, I'm out! [...] if it takes me away from the emotion then I don't want it (MAKROPOL's art director, personal communication, January 2020).

This particular attention to the exploration of audience experiences through technology also reflects how exhibition formats, in particular the spatial arrangements, are an inherent dimension of the artworks that MAKROPOL produces. An example is how the art director describes the making of *ANTHROPIA*, an installation exhibited at the art center Copenhagen Contemporary in 2017:

The idea... is a three-room structure where you have a preparation room and an experience room, and then a contemplation room... this would be sort of the model for how to experience these kinds of works (MAKROPOL's art director, personal communication, January 2020).

From this description, we learn how the art director makes sense of his work by taking into account the venue where the work is experienced, and how the work is presented to audiences. This becomes clear to us when participating in one of the tests conducted by the studio when making a dinner performance titled *Martyr*:

As the door opens, I see a computer on the left and two people working at it. The room is small, it has a reddish atmospheric light, and the floor is covered with a beautiful carpet. It reminds me of a rehearsal room, the acoustics of the room make it a very intimate space where I am soon to spend time eating unknown food with strangers. I know some of the food is meat. I have been warned the dinner is not vegetarian. As I sit, I realize we are about ten participants. We are sitting on the floor, on comfortable pillows, the art director of MAKROPOL is standing up. He asks us to follow his instructions over the course of the dinner. Then he shows us the containers of our dinner, bamboo steam baskets which organize our dinner like stacking dolls. We are informed that we are soon to discover each course as we are told to uncover the lids of each layer of the basket. By our side is a wireless virtual reality headset. After we drink the first course, a soup, without having to strap on the virtual reality headset, we are asked to play a game; we strap on the headset,

and through it I see the room in three-dimensional space. I see the others as faceless grayish avatars; I can hear them breathing and moving in the room, synchronized with their simplified 3D representations. We are then asked to stand up and play a game. It is about eye contact (field note excerpt, QUID PRO QUO VR dinner performance, January 2020).

Through this account it is possible to identify how the venue and its space are not just a platform for displaying art made with VR technology – in fact, the space and what happens within it are part of what constitutes the artwork. In other words, the installation is the work (Graham, 2016). Drawing from his experience as a film and theater director, the art director also refers to performative elements that are part of his work, which help him structure the space. As he further illustrates when referring to a prototype of the performance QUID PRO QUO/*Martyr* (2020):

Often with these kinds of installations, the space plays a character almost. So, we can't make it for any place. Because we need the sensors, and stuff in the room, and we needed to set it up in a specific way. And when we do it – you saw it – when you go into the virtual world, the virtual world and the real world are aligned one-to-one, so when you touch the wall in the virtual world – well, you touch it for real, and there's a point to that (MAKROPOL's art director, personal communication, January 2020).

Importantly for us, it is in the art director's opinion in the very nature of an artwork, that the artistic vision is developed by a collective of both internal and external collaborators with different forms of expertise. A collaborative approach also implies that the artwork is conceptualized, shaped and realized collectively by those who take part in the process. This means that the ownership of the artwork is distributed. In line with the art director, the lead producer asserts: "No one owns the idea. It's something that is between us" (Personal Communication, January 2020). The particular emphasis on XR (mixed reality) art as an exploration of individual and collective artistic visions, thus makes commercial opportunities a secondary matter for MAKROPOL. As the art director explains, their motivations for creating artworks are related to their artistic desire to experiment with emotions and the audiences' lived experiences:

We have no interest in the commercial market. We have an interest in changing people's lives and, of course, if we can make a project that's... how can I say? sustainable enough to actually support a lot of audiences, of course we would love that! And we wouldn't say no to money coming in... But we wouldn't commercialize a project... That's not what we want to do... what we are doing is that we are collecting knowledge that we've gained from all these projects, we have a PhD student working on embodied cinema and writing a PhD about it. So, all our methods and ideas, she puts them into an academic context, so we can share our knowledge (MAKROPOL's art director, personal communication, January 2020).

Rather than focusing on the artwork as a commodity, at MAKROPOL works are a process from which new knowledge can be generated:

For me, the most interesting thing about working on these projects now is that we've been connected to more research. In the beginning, a lot of this was just done out of intuition, or necessity, or just not really reflecting on it. And forcing us to reflect on it, I think is really healthy. Having someone around who is observing, who is challenging us to reflect, interviewing us at times... Ideally for me, we will create a knowledge base from which you can grow more of this type of knowledge, and you can learn and be taught, be trained, from which you can take tools and create (MAKROPOL's lead producer and founder, personal communication, January 2020)

Producing and leading XR art

Given that MAKROPOL draws from film or theater, its members seem to translate the organizational routines of theater production and filmmaking into the new terrain of XR art when exploring ways of managing their projects. In this way, they account for specific “protocols” and working structures that very much relate to film and theater. As the director explains, "you put a lot of people together for a time period, and then there's a result of that [collaboration]" (personal communication, January 2020).

With a primary focus on experimental art projects in film and theater, producing XR art at MARKOPOL often involves a lead producer, an art director, and a range of external collaborators – from artists and programmers, to funding institutions. While the lead producer and art director sometimes bounce ideas off each other, sometimes it is actually the lead producer who primarily conceptualizes the ideas, which are later developed by an artist(s), a team of technical professionals and other collaborators. As the art director and lead producer explain separately in different situations:

It's a very fluid process where the idea sort of bounces off people, you know, people you reach out to [...] and then suddenly it sort of finds its form and its partners and its team naturally (personal communication, January 2020).

Since the individual works must be experienced as chapters of a unified work, every work has to be aware of what happens before and what happens after. And the acquisition of this awareness demands that the artists and the surrounding team open up and share their ideas, their knowledge, their method, in order to enrich the collective work (MAKROPOL, 2017a; 0:39).

In this sense, what defines a good idea at MAKROPOL is a collaborative endeavor that emerges from individual and collective passions, visions, and skills. The initial artistic vision evolves within

their cross-disciplinary teams. In addition to the production team, funding institutions also shape productions outside the collaborative work of the team. This means that external financial support and the composition of the team also play key roles in the realization of some projects over others. As the lead producer explains, after the initial idea emerges, factors influencing its execution include the feasibility of finding external funding or the team configuration:

So, in a sense there was also the evolutionary decision tree that a lot of projects start off with, we believe they are good, and then they move into the real world and they start meeting realistic boundaries, like where's the funding coming from? Who is the team going to be? And how are we going to actually anchor this into some sort of process that will make sense. And if they don't, nine out of ten projects don't, they fall into the background, right? One out of ten projects reach somewhere where we are actually able to, to produce it, make it, and give it to the audience (personal communication, January 2020).

Art production at MAKROPOL is a collaborative process in which specific skills contribute to the production of a work. In this way, leadership of the project is at stake in terms of coordination across the whole team. Driven by an individual and a collective artistic vision within the studio, leadership is thus primarily practiced as a passion for art. Each team member is respected with regard to their skills and knowledge:

So, I write a script normally, and the script would be the thing that everybody is working from. And then of course you can interpret the script in different ways. And then we talk about that along the way, how to interpret this scene or this element (MAKROPOL's art director, personal communication, January 2020).

So, the producer has that power, but then at the same time, the producer is also giving up power to artistic visionaries who want to realize their vision. And it's my job as a producer to help them reach that vision. Otherwise, this will not be a good project (MAKROPOL's founder and producer, personal communication, January 2020).

Interestingly, when the lead producer refers to the responsibilities behind his work, he specifically reflects on his responsibility towards the well-being of his collaborators, especially with regard to artists' needs. These reflections, as he explains, are emotionally charged:

This is not a small team of creatives coming together just to see if they could do something fun together. It's like, this is their life and death... If they make something and it's being... it's killed in the press, it'll hurt them personally. You know? So, the artistic responsibility that people bring to the table is critical and is pretty big (MAKROPOL's founder and lead producer, personal communication, January 2020).

In addition to the lead producers' and art directors' views on their collaborations with artists, which imply responsibility towards their collaborators' processes and well-being, they also mention the role of the creative technologist. A creative technologist is understood as the team member capable of understanding programming languages, and who has the technical skills to realize specific installations or experiments. These members are extremely valued by MAKROPOL, and are thus also part of leading the project within their field of expertise, in contrast to Khora Contemporary:

Coming back to the film structure, what I love about the film hierarchy is that it's sort of already defined by what they call A functions and B functions. And they say, you know, on the A function level, we have the cinematographer, the scriptwriter, the producer, the director, production designer, sometimes, and sound designer, right? These are the necessary functions and people with their specific knowledge [...] But then you have, in this new world, I would argue, you have the creative technologist who is an A function, put in the same bracket as these other A functions, because their creative involvement in what code can do will be crucial for some future projects, even in film actually. [...] you need to put someone in the middle of that team who understands the power of code (MAKROPOL's founder and lead producer, personal communication, January 2020).

Interestingly, within this particular way of understanding MAKROPOL's projects, leadership roles shift depending on the project and the type of experts collaborating on it. In this way, leadership in each project is a process of development that is shaped not only by the types of skills needed, but also by practical constraints (i.e., deadlines, budgets) or collaborators (e.g., a chef, an artist, a creative technologist). Leadership, in this manner, is based on continuous reflection on the capabilities of the team and the intended project. This type of structure also influences the enactment of leadership, not only by the lead producer and art director, but also by their collaborators. As MAKROPOL's industrial PhD reflects in conversation with the founder and lead producer:

My experience is that it's not just you and the art director, but the general team, I think you are feeling the response that you get from the internal team. If people like an idea – if they say this is great! We want to do this... from their judgment when you're pitching something completely new. If they like it and if that is something they want to work on [...] I've just observed that it actually matters the kind of internal response you get from the team (MAKROPOL's industrial PhD, personal communication, January 2020).

In this particular view, in which ideas emerge from an individual's artistic vision and later evolve through the team's "collective consciousness" (art director, personal communication, January 2020), we identify a great level of reflexivity and empathy.

Relevance of the museum

In the VR art landscape that MAKROPOL has depicted for us, the art museum doesn't necessarily seem to occupy a central position. This perhaps has to do with the field of film and theater that MAKROPOL operates in, that also includes specialized art spaces, such as festivals or industry events. That said, the museum does appear to be an important member of their VR network, where museums together with others can bounce ideas off each other, or events can serve as venues, including in a funding application (MAKROPOL's art director, January 2020). Even though the museum is present as a venue and collaborator in applications, museum collaborations are not a seal of approval. For instance, the lead producer of MAKROPOL mentions how they approached a museum to create a podcast that ended up in a collaboration with a start-up instead, as the company had the expertise MAKROPOL needed to develop the project. Eventually the project received financial backing.

Here, the museum presents itself as an important "node" of the VR art network, as a partner and an initiator of an idea that can potentially shape the direction of a given project within a digital arts network. While these ideas eventually materialize as an artifact or a work, the process in fact involves collective conceptualization that originates from an unexpected place, and thereafter finds its form, partners and team. The museum, in this process, takes on a role in production and ideation rather than distribution, collection or historicization.

Nonetheless, when it comes to the distribution of VR art, museums can potentially lose their relevance due to their lack of specialization in facilitating a particular type of audience experience. One of the examples is MAKROPOL's interest in establishing a venue to experience extended reality works. As we illustrate with the dinner performance *QUID PRO QUO*, an intimate location outside of the museum can serve as powerful space in which to explore audience experiences. Yet this kind of installation requires dedicated staff and performers, which can be a challenge in practice. Museums are losing their relevance not necessarily through competition from alternative exhibition venues, but due to limited resources for establishing such spaces for temporary exhibitions and long-term collections. Oftentimes, the institutions providing financial support play a larger role as a seal of approval for the kind of works produced by MAKROPOL.

MAKROPOL's employees reflect on the artistic vision in their productions as an idea that is subjective to the artist, but which is also developed collectively. In conceptualizing the artistic vision, technology is not just a tool for executing an artistic vision, but an integral part of the exploration of a work. In this sense, artworks are not seen as a commodity. Instead, art production is a way to experiment and generate knowledge through the exploration of different media and artistic visions with audiences.

On the one hand, art productions at MAKROPOL therefore draw from the dual leadership approaches in the context of theater and cinema, with an art director overseeing the artistic excellence and a producer overseeing the administrative efficacy. On the other hand, the way the projects are led is also contingent on the nature of the project, the characters and capabilities of

collaborators, as well as on an awareness of practical and financial constraints. In projects that are exploratory in nature, leadership at MAKROPOL is largely distributed among the collaborators, especially the technical experts. The art director and lead producer constantly adjust their leadership approach to the dynamics among the collaborators, an approach which is characterized by a great level of reflexivity and empathy towards collaborators (including audiences) from individuals in leadership roles.

DISCUSSION

At first sight, investigating small digital art production studios to understand museum leadership may seem an odd choice. Nevertheless, we have argued that there is a need to understand the collaboration between art museums and creative studios as an increasingly important “node” in the context of digital art. Small art production studios can provide inspiration as empirical examples of experimental prototypes for leadership approaches. We believe our findings contribute to museum leadership’s understanding of digital art by identifying: 1) how specific motivations drive the choice of leadership practices in the context of digital art production and distribution, and 2) how museum leadership can address collaboration with creative studios in the broader context of digital art, while also remaining attentive to the ethical implications of such collaborations when inviting audiences to take part at the intersection of market and knowledge-driven explorations.

First, how specific motivations drive the choice of leadership practices in the context of digital art production and distribution

As with any shift in thinking, each art museum may have its own perspective on interpreting change and the constant development of digital art, and subsequently choose divergent leadership approaches to address perceived changes. What is central to the museum professionals’ interpretation of emergent changes and their subsequent choice of leadership, is the desire to understand the relevance of museums in society and for the community around them (Anderson, 2004).

Similarly, the choice of leadership approach in creative studios is also guided by clear visions for how digital artworks can be relevant in specific communities or fields (e.g., commercial art, cinema). For example, in Khora Contemporary’s self-identified, modern-day model of *Renaissance bottega/Renaissance studio* (Wallace, 2014), an artist leads a group of technologists. The directors of Khora Contemporary serve as the interface with the artist, while the technologists and the “patrons” across the world scout and negotiate on behalf of the artist. In Khora Contemporary’s case the choice of a given leadership model is guided by a clear vision for establishing their productions in the digital art market, and Khora Contemporary as a world-leading production studio for VR art.

MAKROPOL's leadership model, on the other hand, is based upon the view of XR art as an exploration of artistic ideas and audiences' lived experiences. And their choice is contingent on the ownership of the artistic vision. When following an individual artistic vision (e.g., that of the art director), the studio often deploys a dual leadership (i.e., producer and art director) approach that is rooted in film production. Following the hierarchical structure of A and B functions, the producer and director, at first glance, seem to have more decision-making power than other staff, such as technical experts. But oftentimes, MAKROPOL takes on a collective approach, where leadership is distributed across team members with different types of expertise, with shifting roles and power relations. Meanwhile, the producer remains engaged in continuous reflection on the capabilities of the team and gives special attention to the well-being of all members, especially artists and audiences.

In both cases, the understanding of VR art and digital art speaks to some of the same logics that underlie museum paradigm shifts, such as financial support cuts and a market-driven turn. These changes serve as a good foundation with which to relate our findings to museum leadership choices in the context of digital art. At Khora Contemporary, their view of VR art as a new category in the art market and their branding of VR as a new art medium, largely resonates with the transformation of museums that is increasingly dominated by a market ideology (Rottenberg, 2002), with particular influence from both art and technology markets. Khora Contemporary's link to the private collection Faurschou Foundation may to some extent also suggest a position that is collection-driven and elitist (Anderson, 2004; Silverman, 2005). By contrast, MAKROPOL's view of XR art as an exploration of artistic ideas, audiences' lived experiences and knowledge sharing, resonates with the transformation of museums into visitor-centered (Anderson, 2004), knowledge-driven cultural institutions that serve the public (Anderson, 2004; Silverman, 2005).

Against this backdrop, we argue, both art museums and creative studios are important "nodes" in the digital art network; they share similar influences to the ongoing museum paradigm shifts, where multiple interpretations of the *drive for* and *relevance of* engaging with digital art co-exist. Following this line of thought, we argue that museum professionals, when engaging in digital arts projects with creative studios, need to reflect on their and other actors' motivations for producing and distributing digital art, and identify which leadership approach fits best. Either by taking a market-oriented approach, centered on a hierarchical structure in which the artistic vision and the technology attract audiences and visitors; or a knowledge-oriented approach, in which collaborators share their artistic visions and focus on exploring how to engage audiences as part of a collective vision.

In this sense, we can trace the combination of both individual and relational leadership approaches in the two cases; the choice of a specific leadership approach depends on the artistic vision and agenda of leaders as market-oriented or knowledge-oriented. Looking back at contemporary art museums, we argue that the "digital turn" in art has created a similarly complex landscape of divergent views of digital art (Graham & Cook, 2010; Paul, 2008b, 2016), and requires careful

navigation by museum professionals to identify which approach fits the vision of a given museum. We need to be especially mindful about the differences in the sources of the vision: whether it is rooted in the desire to promote the adoption of emergent digital technologies in art, in promoting digital artwork as a commodity, or derives from the desire to generate knowledge through collective participation in interpreting and creating digital art.

This is particularly revealing for us, as we see how the market-driven and knowledge sharing agendas in combination may pose questions about how to best involve audiences. Market-driven approaches may conflict with audience-centered approaches as the choice of technologies may be influenced by particular market players. In particular, VR has a historical trajectory that traces back to military research, which has given rise to ethical concerns in research (Madary & Metzinger, 2016). Having these concerns in mind, contemporary art museums and their leaders have the responsibility and capability to trace the inherited values of digital technologies, such as VR, as they are explored within and beyond cultural spaces, with audiences at the center. Following market-driven approaches in technology development, the contemporary art museum may be particularly relevant for critically approaching how audiences are invited to explore digital art, not as consumers, but as participants and interpreters who are both critical of and vulnerable in such explorations. The ethical concern also speaks to the current context of the Covid-19 pandemic, where important questions about safety and hygiene are challenging the realization of public VR exhibitions, leading to alternative ways of working with the complexity of digital art forms, or turning towards different media.

Second, how museum leadership can address collaboration with creative studios in the context of digital art

Based on our findings, we argue there is a sense of urgency for the museum to find the “right” approach to work with creative studios. Although contemporary art museums are still implied as a “seal of approval” (Graham & Cook, 2010, p. 190) for digital art, their relevance seems to be shifting in the eyes of our case organizations, in competition with alternative expertise and resources that enable the realization of digital art projects. Venues such as specialized galleries, art institutions, and tech festivals, which are experienced and knowledgeable about displaying, interpreting and collecting digital art, seem to be increasingly present in the production studios’ planning for production and exhibition of their works. While specialist digital art institutions have been on the rise since the 1980s, such as FACT in Liverpool and ZKM in Karlsruhe (ibid.), they did not shake the dominant role contemporary art museums have held with regard to legitimizing art forms, due to their unique ensemble of exhibition, historization, and discussion. What may be a game changer today is the increasing interest from funding institutions, like the Nordic Film Fund and Innovation Fund Denmark, in driving the changes in digital art by providing sustainable financial support for creative studios like MAKROPOL to generate knowledge and establish specialist venues. These investments can attract audiences and create new business opportunities at the intersection of technology development and art. In this context, then, how can museum

leadership ensure contemporary art museums do not become overshadowed as venues and collaborators in tracing the history of digital art?

While our study may just begin to answer this question, based on our observations, museum leadership can perhaps start by probing three dimensions: the changing nature of the museum; knowledge about the kinds of digital art that museums work with; and how audiences and technologies are involved and considered. As art museums initiate and adapt to the paradigm shifts, changing from static-monolithic to dynamic-temporized institutions, digital art may find itself to be an *assemblage* and in a flow. With the term *assemblage*, we want to highlight the heterogeneous sources of knowledge which constitute digital art (as we have exemplified with the views of digital art in Khora Contemporary and MAKROPOL) and the noticeable processes of territorialization, where emerging actors in digital art try to establish sources of knowledge that can define digital art (commercial art, theater, cinema and so on). These processes are ongoing and constantly in flux within the current network of digital art, where different roles, processes and dynamics emerge in the interplay between the involved actors.

Thus, for contemporary art museums to be able to remain relevant when exhibiting, historicizing and discussing digital art, it is key for them to partake in the networking and understanding of artworks in light of diverse expertise, as commodities and as an evolving art genre. We argue, therefore, that the museum itself should also be mobilized as a network of agents, where the curator, technologist, and production studio all “lead” the way for understanding digital art from their own perspectives, and where their roles are emergent and adaptive. For instance, technologists, professionals with technical capabilities, play an increasingly important role in the ideation and production of digital art. Seeing digital art from their perspective can be incredibly important for understanding and critically attending to the development of digital art. On the other hand, informing their practices with critical and historical contextualization of such technologies from a contemporary art perspective, may also influence the consideration of audiences and technology in digital art productions.

Due to the different actors involved in the production and distribution of VR art, the processes can look very different and be motivated by divergent agendas, both market-oriented and concerned with knowledge production. Recognizing and documenting the changing process of production and distribution is also important in generating and historicizing digital art projects. Understanding these processes can also provide insights into curatorial practices such as exhibition design and ethical consideration of how to involve audiences in digital art exhibition contexts. Exhibitions of finished work may not be the only suitable format, and the increase in processual work exhibitions as knowledge-generating events may lead to questions about how to attend to the needs and authorship of audiences. In this sense, the exhibition is also a way of generating knowledge that requires careful consideration of audience experiences, and contextualization of the motivations behind the use of particular technologies in such experiments. Especially in the context of VR, careful consideration of the bodies and minds of the audience may be paramount when market-

driven productions intersect with knowledge-driven endeavors. In this context, the contemporary art museum is a valuable platform for exploring leadership models when working with digital art such as VR art, while also being attentive to exhibition histories and the ethical questions at stake when market and knowledge-driven agendas are blurred in practice.

CONCLUSION

In this study, through the case studies of two Copenhagen-based VR art production studios, Khora Contemporary and MAKROPOL, we have come to understand their views of VR art and how these views drive their choices regarding leadership practice in the production and distribution of VR art. Our findings have important implications for museum studies and museum professionals in understanding how to maintain the relevance of contemporary art museums in the evolving scene of digital art, by linking views of digital art, museum paradigm shifts, and choice of leadership approach. Our findings show that leadership practices in the context of digital art are a matter of fit, depending on the drive of the project and the actual interactions among the collaborators. This also means that leadership is a developing process that is based on continuous reflection on the capabilities of and dynamics between the collaborators. Our study also serves as a first step in exploring museum collaboration with creative studios in the context of digital art and its influence on museum leadership. We argue that, in the context of digital art, the relevance of the art museum is shifting in the eyes of creative studios, as funding institutions increasingly support knowledge production by creative studios and the establishment of specialist venues based on these knowledges. To address this challenge, the museum needs to mobilize itself within a network of agents whose expertise is diverse and who “lead” digital art projects contingently. In addition, we argue that as these studios become prevalent on the digital art scene, involving audiences in their production and distribution endeavors, the contemporary art museum has the potential to become a platform that carefully negotiates the ethical and contextual implications found in leading digital art projects at the intersection of market and knowledge-driven agendas.

NOTE

1. While curators and scholars (Graham & Cook, 2010; Paul, 2008a, 2016) suggest overlaps and nuanced differences between the two terms, we choose to use the term “digital art” to highlight our focus on artistic explorations based on digital technology, and their implications for art museum leadership in this study.
2. While writing this paper, the art director at MAKROPOL decided to pursue a new project as a film director, thus becoming a temporary employee or project-based collaborator.

REFERENCES

Anderson, G. (2004). *Reinventing the museum: Historical and contemporary perspectives on the paradigm shift*. Rowman Altamira.

- Auvinen, T. (2001). Why is it difficult to manage an opera house? The artistic-economic dichotomy and its manifestations in the organizational structures of five opera organizations. *The Journal of Arts Management, Law, and Society*, 30(4), 268–282.
- Bentkowska-Kafel, A., Cashen, T., & Gardiner, H. (Eds.). (2005). *Digital art history: A subject in transition*. Intellect.
- Bruch, K. (2011). *An analysis of art museum directors, 1990-2010*. American University.
- Caust, J. (2010). Does the art end when the management begins? The challenges of making ‘art’ for both artists and arts managers. *Asia Pacific Journal of Arts and Cultural Management*, 7(2).
- Caust, J. (2018). *Arts Leadership in Contemporary Contexts*. Routledge.
- Chatel, M. (2019, December 2). *18 Museums Boosting the Scene of Digital Art*. Medium.
<https://medium.com/digital-art-weekly/18-museums-boosting-the-scene-of-digital-art-f8a4b4fa5eb9>
- Cobo. (2017, June 13). *Virtual Reality Art Brought by Christian Lemmerz*.
https://www.youtube.com/watch?v=ZjTX06DnSEI&feature=emb_title
- Cray, D., Inglis, L., & Freeman, S. (2007). Managing the arts: Leadership and decision making under dual rationalities. *The Journal of Arts Management, Law, and Society*, 36(4), 295–313.
- Davies, C. (2004). Virtual space. *Space: In Science, Art and Society*, 69–104.
- De Voogt, A. (2006). Dual leadership as a problem-solving tool in arts organizations. *International Journal of Arts Management*, 17–22.
- Rubio, F.D. (2014). *Preserving the unpreservable: Docile and unruly objects at MoMA*.
<https://escholarship.org/uc/item/9qr4d9qx>

- Faurschou Foundation. (2019). *About Faurschou Foundation*. <https://www.faurschou.com/about-faurschou-foundation/>
- EEVO. (2020). *First Look: Artists' VR*. <https://apps.apple.com/us/app/first-look-artists-vr/id1191738657>
- Graham, B. (2016). Exhibition Histories and Futures. In *A Companion to Digital Art* (pp. 575–596). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118475249.ch27>
- Graham, B., & Cook, S. (2010). *Rethinking Curating: Art After New Media*. MIT Press.
- Grau, O. (2003). *Virtual Art: From Illusion to Immersion*. MIT Press.
- Griffin, D. J. G. (1987). Managing in the museum organization: I. Leadership and communication. *International Journal of Museum Management and Curatorship*, 6(4), 387–398. [https://doi.org/10.1016/0260-4779\(87\)90021-5](https://doi.org/10.1016/0260-4779(87)90021-5)
- Griffin, Des. (2003). Leaders in Museums: Entrepreneurs or Role Models? *International Journal of Arts Management*, 5(2), 4–14. JSTOR.
- Griffin, Des, & Abraham, M. (2000). The effective management of museums: Cohesive leadership and visitor-focused public programming. *Museum Management and Curatorship*, 18(4), 335–368.
- Immersence. (2021). *Immersence*. <http://www.immersence.com/>
- Järvinen, M., Ansio, H., & Houni, P. (2015). New Variations of Dual Leadership: Insights From Finnish Theatre. *International Journal of Arts Management*, 17(3).
- Khora. (2021). Museums & Tourism. *Khora | Expanding Reality*. <https://khora.com/museums-tourism/>
- Khora Contemporary. (2018a, February 9). News. *Khora Contemporary*. <https://khoracontemporary.com/news/>

- Khora Contemporary. (2018b, September 12). *An Introduction to Khora Contemporary*.
<https://www.youtube.com/watch?v=Bsh4RYGAO50>
- Khora Contemporary. (2018c, September 12). *Khora Contemporary—Yu Hong*.
https://www.youtube.com/watch?v=DvU_x9t7Y3I
- Khora Contemporary. (2020). About Khora. *About Khora*. <https://khoracontemporary.com/about/>
- Landry, P. (2011). A conceptual framework for studying succession in artistic and administrative leadership in the cultural sector. *International Journal of Arts Management*, 13(2), 44.
- Lapierre, L. (2001). Leadership and Arts Management. *International Journal of Arts Management*, 3(3), 4–12. JSTOR.
- MacNeill, K., & Tonks, A. (2013). Leadership in Australian Arts Companies: One Size Does Not Fit All. *Arts Leadership*, 69–81.
- Madary, M., & Metzinger, T. K. (2016). Real Virtuality: A Code of Ethical Conduct. Recommendations for Good Scientific Practice and the Consumers of VR-Technology. *Frontiers in Robotics and AI*, 3. <https://doi.org/10.3389/frobt.2016.00003>
- MAKROPOL. (2017a, August 25). *TRAVERSE 2017*. <https://vimeo.com/231048574>
- MAKROPOL. (2020a). *MAKROPOL*. <http://makropol.dk/>
- MAKROPOL. (2020b). *QUID PROQUO TRIAL DINNER Invitation*.
<https://www.facebook.com/makropol/posts/2685193548194939>
- Matney, L. (2020, October 2). Google wakes up from its VR daydream. *TechCrunch*.
<https://social.techcrunch.com/2020/10/02/google-wakes-up-from-its-vr-daydream/>
- Parry, R. (2013). The End of the Beginning: Normativity in the Postdigital Museum. *Museum Worlds*, 1(1), 24–39. <https://doi.org/10.3167/armw.2013.010103>
- Paul, C. (2008a). *Digital art* (Vol. 224). Thames & Hudson London.

- Paul, C. (2008b). New media in the white cube and beyond: Curatorial models for digital art. *Leonardo Reviews Quarterly*, 1(2010), 33.
- Paul, C. (2016). *A Companion to Digital Art*. John Wiley & Sons.
- Peacock, D. (2008). Making Ways for Change: Museums, Disruptive Technologies and Organisational Change. *Museum Management and Curatorship*, 23(4), 333–351. <https://doi.org/10.1080/09647770802517324>
- Pink, S., & Morgan, J. (2013). Short-Term Ethnography: Intense Routes to Knowing. *Symbolic Interaction*, 36(3), 351–361. <https://doi.org/10.1002/symb.66>
- Reynolds, S., Tonks, A., & MacNeill, K. (2017). Collaborative Leadership in the Arts as a Unique Form of Dual Leadership. *The Journal of Arts Management, Law, and Society*, 47(2), 89–104. <https://doi.org/10.1080/10632921.2016.1241968>
- Rothberg, S. (2020). *Touching a Cactus*. <https://sarahrothberg.com/TOUCHING-A-CACTUS>
- Rottenberg, B. L. (2002). Museums, information and the public sphere. *Museum International*, 54(4), 21–28.
- Schuir, J., Vogel, J., Teuteberg, F., & Thomas, O. (2020). Understanding the Augmented and Virtual Reality Business Ecosystem: An e3-value Approach. In B. Shishkov (Ed.), *Business Modeling and Software Design* (pp. 240–256). Springer International Publishing. https://doi.org/10.1007/978-3-030-52306-0_15
- Sicca, L. M., & Zan, L. (2005). Much Ado About Management: Managerial Rhetoric in the Transformation of Italian Opera Houses. *International Journal of Arts Management*, 7(3), 46–64. JSTOR.
- Silverman, H. (2005). Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift. *American Anthropologist*, 107(4), 715.

Stein, T. S., & Bathurst, J. (2008). *Performing arts management: A handbook of professional practices*. Skyhorse Publishing Inc.

Suchy, S. (2004). *Leading with Passion: Change Management in the 21st-century Museum*. Rowman Altamira.

Virk. (2020a). *Khora Contemporary ApS* [Khora Contemporary ApS]. Datacvr.Virk.Dk.
<https://datacvr.virk.dk/data/visenhed?enhedstype=virksomhed&id=4006696371&language=en-gb>

Virk. (2020b). *MAKROPOL ApS*. <https://cvrapi.dk/virksomhed/dk/makropol-aps/33953437>

Wallace, I. (2014). *The Evolution of the Artist's Studio, From Renaissance Bottega to Assembly Line | Art for Sale | Artspace*.

https://www.artspace.com/magazine/art_101/art_market/the-evolution-of-the-artists-studio-52374

Table 1
Data Collection Overview

Semi-structured interviews	Informant	Organizational affiliation	Duration (minutes)
	Artist and director	MAKROPOL (M)	61
	Founder and industrial PhD (interviewed together due to close collaboration)	MAKROPOL (M)	58
	Director	Khora Contemporary (KC)	40
Participant observations	Participation at CC Lab: Virtual Reality exhibition at Copenhagen Contemporary in 2017, Khora Contemporary's hall. One of the authors visited the exhibition and experienced the works exhibited by Khora Contemporary.		180
	Participation at network event: 'Virtual Reality in Contemporary art' at Art Hub Copenhagen in 2019. Directors at Khora Contemporary and MAKROPOL participated in the event.		200
	Participation at performance test QUID PRO QUO for the creation of the dinner performance Martyr. The event was held at the art institution Kunsthall Charlottenborg in the backstage of the cafeteria. One of the authors participated in the dinner and was an informant of the study carried out by MAKROPOL's industrial PhD student.		200
Archival materials	Website communication		
	Two videos about Khora Contemporary made by the studio (Khora Contemporary, 2018b, 2018c)		
	Two short films about MAKROPOL made by the studio (MAKROPOL, 2017a, 2017b)		
	Interview with artist Christian Lemmerz and Khora Contemporary's producer (Cobo, 2017)		

Table 2*Sample of Interview Questions*

Participants	Sample of questions
Interviewee 1: Art director, Khora Contemporary (KC)	<p>In your own words, could you describe what KC is/does?</p> <p>Could you describe the organization in terms of who is mainly leading KC's projects?</p> <p>How do you normally approach museums to establish a collaboration?</p> <p>What are the principles for selecting a museum to work with? What do museum directors tend to focus on?</p> <p>What role do you play as an art director in the collaboration between KC and Faurschou Foundation?</p>
Interviewee 2: Director, MAKROPOL (M)	<p>In your own words, could you describe what M is/does?</p> <p>What field do you think M belongs to?</p> <p>When you describe M, you use the word studio. Can you elaborate a bit more on what it means to you?</p> <p>What types of projects do you work on as part of M?</p> <p>Can you describe some of the current projects that you are working on?</p> <p>What does your team normally look like, who is part of your team?</p>
Interviewee 3 and 4: Producer and PhD student, MAKROPOL (M)	<p>In your own words, could you describe your role at M?</p> <p>What are your main areas of collaboration?</p> <p>Could you give us an example or examples of the type of collaborations that you work on?</p> <p>How do you normally approach other partners or collaborators? What about galleries or museums?</p> <p>Which factors influence your collaboration with a museum?</p>

Table 3*Example of the Codebook*

Open code	Focused code	Description	Example of empirical material
View of technology	Viewing technology in art as a tool	KC's art director describes technology as a tool for exploration in art.	<p>“We know technology at the end of the day is just a tool. The artists are using it to probe, but still building on art history and the whole historical legacy that came before them.”</p> <p>- Interview excerpt, KC's art director</p>
View of art	Following faithfully the artist's vision	KC's art director explains how artworks produced by KC are faithful creations of the artist's vision	<p>“[Khora Contemporary] tries and faithfully [...] recreates the concept that the artist has in mind in the medium and tries and finds a way to [...] produce as loyally as possible what they had in mind.”</p> <p>- Interview excerpt, KC's art director</p>
View of leadership	Making sense of art production as a fluid and collaborative process	The process of art production at M is explained by the Producer as collaborative ideation, influenced by who is part of the process.	<p>It's a very fluid process where the idea sort of bounces off people, you know, people you reach out to. [...] and then suddenly it sort of finds its form and its partners and its team naturally.</p> <p>- Video transcript, M's producer</p>
View of leadership	Acknowledging the influence of funding partners and collaborators	M's producer explains how external factors such as financial support and external collaborators are part of the decision-making process in realizing a project over others.	<p>“Of course, we need the money and the funding, to keep it going, and a lot of projects have been good and died after a month or a year because the format proved it didn't work or the content proved it couldn't get funding, and projects sort of just fell apart. So, in a sense there was also the evolutionary decision tree that says a lot of projects start off by, we believe they are good, and then they move into the real world and they start meeting realistic boundaries like where's the funding coming from? Who is the team going to be?”</p> <p>- Interview excerpt, M's producer</p>