Preserving Interactives

Preserving audio-visual materials in a post-broadcasting paradigm

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Introduction

A few decades into what is often being called 'the digital era', cultural heritage institutions are faced with the challenge of trying to capture and preserve those artefacts that it has produced so far and to anticipate those to come. As memory institutions their goal remains the same, namely "to provide reliable, long-term access to managed digital resources to its Designated Community, now and into the future."[1] Undoubtedly, digital technology has been beneficial for memory institutions. It has given them new ways of preserving their assets through digitization[2] and migration, and they can make them widely accessible through intuitive cataloguing systems and online distribution. Huge amounts of data, brought together in data-sets, can be used for political, sociological and historical research. Producers and artists make extensive use of the wide variety of material that is available for reuse, reflecting the properties of what we could call a 'remix culture' (Lessig: 2008).

At the risk of stating the obvious: the challenges and difficulties of preservation in the digital era are as manifold as its benefits. The interactives here discussed could well be the epitome of the problems at hand. They are complex, networked, dynamic, varied and in a state of constant development. A great number of studies and initiatives worldwide address these issues. Tools are developed, policy made, funding found and pilot projects started. However, any finite solution or degree of standardization is, at least for now, not in sight.

This study aims to discuss the issues revolving around mentioned interactive audiovisual productions and the requirements they impose on cultural heritage institutions. It will consider the specific mediality of interactive productions and the analytical tools and concepts that are needed to describe this mediality. It will attempt to give an overview of the situation surrounding interactive audiovisual productions in The Netherlands at present. Also, it will assess some of the preservation methods that are at present available for interactives. All of this will result in a preservation plan for The Netherlands Institute for Sound and Vision, the organization in which the research is being performed.

Context and method

As mentioned above, there is a lot of activity surrounding the preservation of new media. A large part of what this study aims to do is bring together the results of various initiatives and consider these in the specific context of The Netherlands Institute of Sound and Vision. A lot of the research that has been done is found in the arts, linked to the institutional context of museums. Installations and born-digital art are the object matter of recent studies by among others Virtueel Platform (2012), DCA (2012) and POCOS (2012). More often than not, these studies exclude, or barely touch on mainstream media productions, such as the interactives here discussed. Also, online content is to a lesser degree the focus of these studies. Henriksen et al (DCA) for example stress that their study does not address: "the preservation of a more complex character, such as software or Internet-based data." And Ernst's 2013 book *Digital Memory and the Archive* also states that: "An art and archival language has yet to be developed for digitized networked artworks" (82). Another field in which expertise is found is in game-preservation (e.g. Armstrong et al, 2009). A final study I will mention here is an explorative study performed by Van de Graaf of Pleiade Management and Consultancy in 2010. The aim of this study was to determine to what degree Dutch cultural heritage institutions were already collecting born-digital materials. Although at the time 57% of the interviewed cultural heritage institutions already said they were in the executive stage of preserving born-digital material, a closer look at what was meant by this reveals that these materials were exclusively linear in nature.[3]

An important characteristic of this study is its open and fluid structure. Even though it is common practice to work with strict boundaries to make sure the outcome of a study is very specific, I hereby propose to work with a slightly more flexible approach, because as we will see the object of study here discussed is still so much in development and therefore difficult to categorize in a finite way. Instead of a-priori excluding certain productions based on genre, channel of distribution,

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[1] Trusted Digital Repositories: Attributes and Responsibilities. An RLG-OCLC Report. Mountain View, CA: RLG, May 2002.

[2] In which a Dutch collaboration between several archival institutions, "Images for the Future" takes a leading position worldwide. See their website at: http://beeldenvoordetoekomst.nl/en 24/10/2012

[3] Graaf, Maurits van de. *Born-digital erfgoedmaterialen bij een selectie van Nederlandse erfgoedinstellingen*. Pleiade Management en Consultancy, 2010. 11-14

production context, etc. this study will be more focus-driven. By doing so, the possibility of a further categorization of the object of research becomes a part of the study itself. The following working definition of interactives will serve as the starting point:

Media productions with a dominant audiovisual component, that use the World Wide Web and its networked functionality to invoke user response and participation that in turn affect the content, aesthetic and/or functionality of the production.

The focal points that will be considered are:
- productions that are distributed online
- productions that are audiovisual in nature
- productions that cannot be primarily qualified as a computer game
- productions that are valued from a cultural heritage perspective
- productions that circulate in the public domain and for which there is a relatively mainstream audience (for example those productions produced by the public broadcasters in the Netherlands)

These criteria are based on the current preservation policy of Sound and Vision and the mandate they hold as a cultural heritage institution.[4] The productions discussed here can include multi-platform or transmedia projects that contain interactive elements. For reasons discussed in chapter two, these type of productions are more prevalent than single-platform, web-only or 'discrete' objects (De Jong, 2005). To gain insight into the situation in the Netherlands and stimulate the exchange of knowledge between different organizations, I interviewed some of the key players in production and funding and also spoke to representatives of other archives.

Deliverables

- ***Protocol***

One of the results of this research is a concept of a workflow or protocol for interactives that can possibly be implemented. As will be argued, what we are facing here is effectively a 'fuzzy set', a term used in the organizational sciences (Lerner and Wanat, 1983). Organizations working with such a set have a "priority at the operational level (...) to interpolate a workable mandate from the vague charge. (...) Issues of intent must be explored, but from an action-oriented perspective (502)." The protocol developed will hopefully help to move beyond a mere theoretical analysis.

- ***Expertmeeting***

During the research period an expert meeting was organized with a number of representatives of cultural heritage institutions, universities and research platforms to discuss the preliminary findings of this study. The outcome of the expert meeting has been integrated into this research report.

- ***Policy advice***

At the end of the research period an advice was issued for the Netherlands Institute of Sound and Vision, which suggested ways in which to engage with the field of interactive audiovisual content.

[4] These selection criteria are themselves subject to discussion in this study. If, for example, we would drop the criteria of audio-visuality, we could expand to multi-platform/trans-media productions, such as the website for drama series *DE GEHEIMEN VAN BARSLET* (2012) or the forum to documentary series *THE SUNNY SIDE OF SEX* (2011) etc. If we were to leave out the criterion of public funding we could expand our search to interactive commercial campaigns, which opens up an entire new field but simultaneously makes the search very difficult due to the variety in distribution channels. Finally, it could be argued that games, that are educational, 'serious', or have an artistic streak could be considered important audio-visual heritage and therefore should be a part of the collection policy of Sound and Vision.

The Netherlands Institute for Sound and Vision

The research has been performed in close collaboration with the Netherlands Institute for Sound and Vision. Sound and Vision is the largest archive of audio-visual material in the Netherlands and manages approximately 70 per cent of Dutch audiovisual heritage. Their mission according to their website is to be the best audiovisual archive in the digital domain. The institute holds a unique position in the Dutch media landscape ever since it started in 1997, a merger between the Radio and Television Archive of the public broadcasters, the Film Archive of the RVD (Governmental information service) and the foundation for Film and Science. As a result Sound and Vision still provides a service to public broadcasters in both storing their productions and retrieving and delivering archival footage upon request. A second role for the institute lies in preserving the audiovisual heritage of the Netherlands. This is pursued by ensuring long-term preservation and providing meta-data and context information to the assets that are held. Even though Sound and Vision and her position in the Netherlands serve as a case in point, the implications of this study are not restricted to that particular case.

A preservation plan for interactives

The OAIS model of preservation[5] includes a preservation plan which "provides the services and functions for monitoring the environment of the OAIS, providing recommendations and preservation plans to ensure that the information stored in the OAIS remains accessible to, and understandable by, the Designated Community over the Long Term, even if the original computing environment becomes obsolete (4-2)."
It incorporates:

- preservation goals
- user requirements
- preservation policies
- legal obligations
- organizational constraints
- technical constraints

It results in a preservation action plan in which a number of steps or actions are specified as well as who is responsible for the execution of these actions. A so-called 'decision support tool' has been developed called Plato[6] which is basically an online tool that takes you through the four phases that comprise the development of a preservation plan.

Where possible this tool will be used. However, a number of comments need to be made. First; at present there is no clear categorization of the objects here discussed, a suggestion for a solution to this problem will be made in chapter one. Second, Plato is a tool aimed at the use for a homogeneous set of objects from the perspective of preservation risks. Whether this is the case for productions that fall under the umbrella-term interactives remains to be seen. Another preliminary remark concerns the execution of tests or pilots, which is normally an integrated part of the process. At present there is no concrete option of a preservation pilot at hand.

This report

This report is divided into two main sections. The first part deals with the objects that need to be preserved: the interactives. In the first chapter I will try to come up with a workable definition and discuss the difficulties that come with a further categorization. In the second chapter the institutional context in the Netherlands will be described. Attention will be paid to the financing, production and distribution of interactive audiovisual productions. In the third chapter I will try to give an analytical tool that allows us to describe the specific medial qualities of these type of works.

The second section will deal with the consequences for archives and cultural heritage institutions of what has been described in part one. Here the elements of the Plato preservation planning tool will serve as a guideline. In the fourth chapter the preservation goals will be determined,

[5] The 2012 version of which can be found here: http://public.ccsds.org/publications/archive/650x0m2.pdf 15/10/2012
[6] http://www.ifs.tuwien.ac.at/dp/plato/ 15/10/2012

linked to the possible designated communities: the creative industry, academics and the general public. In chapter five a number of preservation methods will be discussed in terms of their merit for the long-term preservation of interactives. In chapter six I will discuss legal and economic considerations. Chapter seven is all about the policy level; the organizational and personnel requirements for heritage institutions that want to engage the complex field of interactive content.

1. Definitions and categories

Introduction

If there is one thing archives and heritage institutions are desperately searching for it is some sort of taxonomy for the emerging field of new media productions. Categories are seen as vital, especially in emerging fields of study. Despite the many attempts at a categorization, it has proven quite difficult. As professor of film theory Vinzenz Hediger puts it: "media art is difficult for critics, curators, and archivists to pin down in terms of the established taxonomies of art history or film and media studies (25)."

The categorization serves a number of purposes. First it is a critical step to distribute the cultural heritage materials among the appropriate heritage organizations in order to avoid overlap or gaps in their combined collections. At present it seems, however, that there is no natural match between the various Dutch archives and the interactive content here addressed. Another reason to look for categories is to be able to create a workflow and access-tools that respect the qualities of a group of productions. A taxonomy finally serves to determine the cultural value and the effort, in terms of time and money, that will henceforth be invested in the preservation of these assets. In this chapter different words and concepts that are being used to describe interactive audiovisual works will be discussed. The problematic status of a categorization of interactives, essentially a 'fuzzy' set, will be described and a suggestion made to use behaviours or properties as a way of organizing workflows.

Terminology and definitions

The terms used to refer to interactive audiovisual productions are numerous. An anthology: complex digital objects, net-art, born-digital art, variable media, ephemeral work, new media art and occurent art. Each of these have their uses and limitations. They do show traces of the specific context in which they originated and the discourses in which they circulate. 'Complex digital object' is a term used by POCOS, a series of symposiums that has been held in the United Kingdom in 2011. They are concerned with software in a wide variety of disciplines.

A lot of the questions that surround the preservation of interactives are most urgently felt in art preservation. Artists are often the first to use media in groundbreaking ways, trying to find the limits of what a particular medium can accomplish. This has resulted in a very diverse collection of installations, sometimes with performative elements. This is where designations like new media art, 'ephemeral art' and 'occurent art' stem from, sometimes with the post-fix 'art' replaced by 'works'. The latter reveals a preoccupation with the authorial voice of the artist, as has been common practice in art preservation. A further variation was needed when works of art became digital (without necessarily comprising a hardware component other than an interface that is widely available such as the personal computer, tablet or smartphone): 'born-digital art'. Digital works that use the specific medial qualities of the Internet are labelled as 'net art', a term preferred by PhD candidate at Goldsmith University, Annet Dekker.[7]

'Variable media' is a term coined by the Variable Media Network (VMN) to serve as a paradigm that "pairs creators with museum and media consultants to imagine potential futures for works in ephemeral formats, including digital media, performances, and installations."[8] They have developed a framework and tool for the documentation of these variable media that will be elaborated on in the second part of this report.

Another expression that has spread rapidly is 'time-based media' or 'time-based media art'. First coined by video artist David Hall in the seventies, it is now being used by Professor of Heritage and Digital Culture at the University of Amsterdam, Julia Noordergraaf (2013) and in communication of Tate museums. It refers to works of art that depend on technology and have duration as a dimension, although normally this temporal dimension can be resisted. They can consist of (a combination of) video, film, audio and computer-based installations.

A final term here presented is 'Behaviourist Art', which "constitutes a retroactive process of human involvement, in which the artifact functions as both matrix and catalyst. As matrix, it is the substance between two sets of behaviors; it neither exists for itself nor by itself. As a catalyst, it triggers changes in the spectator's total behavior (Ascott, 2002)." More on this in chapter three.

The term interactives has been chosen to avoid the immediate association with art as it is presented in the context of a museum, the post-fix 'art' and 'work' will therefore be avoided. What the

[7] In her study "Born-digital kunstwerken in Nederland" (2012), assigned by Virtueel Platform, she uses the term born-digital only because it helped in the communication with museums. Other designations were taken to include video-art and video installations. In her PHD research at Goldsmith University she maintains the term net art.
[8] http://www.variablemedia.net 5-11-2012

productions here presented have in common is that they are distributed via the Internet, either through a website on the World Wide Web, through download on the app-store or via net tv.

Taxonomies

What all of the abovementioned terms have in common is that they still cover a wide array of works. They lack specificity and therefore do not hold as a mutually exclusive, collectively exhaustive categorization. The proliferation of terms illustrates that what we are dealing with here can best be described as a 'fuzzy set' (Lerner and Wanat, 1983), a term from mathematics to refer to a set whose elements have only a degree of membership. It can be differentiated from a 'crisp set' or a well-defined set. For example: a collection that exists out of productions from Dutch public broadcasters represents a crisp set, just as all productions distributed through the medium of television. The interactives here discussed cannot be categorized in such a manner and therefore present us with a fuzzy set. A finite definition might not be found. The debate on definitions is unlikely to resolve in the foreseeable future, if at all. In the mean time we need an approach that is more pragmatic and focused on preservation itself.

The earlier mentioned research performed by Van der Graaf (2010) included a proposal for a quantitative measurement tool for born-digital heritage collections (41). The eighteen categories range from e-books and audio files, to games and software. This categorization is problematic because it ignores a key characteristic of born-digital material: convergence. Through convergence any number of combinations between the categories is possible, making it very hard or even impossible to distinguish between them.

The conclusion that the prevalent categorizations are lacking is supported by professor emeritus John Mackenzie Owen when he writes that "it is no longer possible to classify heritage materials in a limited number of distinct media, types and genres: in the digital world these exist in multiple and changing combinations (2007: 47)." Dekker comes to a similar conclusion and suggests we should instead focus on describing the different components of a work.

Properties

A proposition to this end has been made by some of the initiators of the Variable Media Network (VMN), who suggest to speak of behaviours instead of object dependencies such as genre, medium, etc. "The approach is centered on the content of the work rather than its medium or physical manifestation (Ippolito:48)." It focuses on medium-independent behaviours and by doing so avoids the obscurity that surrounds the new media categories. Again, coming from an arts perspective, VMN lists behaviours like: installed, performed, reproduced, duplicated, interactive, encoded, contained and networked. This list, however, is not exhaustive and behaviours can be added. A work of art can be attributed multiple behaviours if needed.

For the interactives here discussed, in a media production-context, not all behaviours are applicable. I have therefore formulated a number of behaviours of interactives that have important consequences for the preservation actions to be taken. Also, because of the abstract nature of the term behaviours, I will call them properties. This list is also not exhaustive but it incorporates the most common properties that interactives at present display. I will here list these properties and define what I mean by them. In appendix 1 a decision tree can be found that combines these properties with the preservation actions that should be taken. Those actions will be described further in chapter five. It must be said that these properties are only useful in organizing preservation workflows or describing protocols, not so much in the distribution of new media productions among different heritage institutions. The properties however do help in adding appropriate descriptive information to productions.

- ***Interactive***

Interactivity is of course the common denominator for interactives. The term interactives is not very widely used, and admittedly also fails to designate a coherent, clearly defined category. It is an obvious derivation of 'interactivity', an ambiguous term that is often used as a broad sweeping, 'easy' label to refer to a combination of technological possibilities and social structures. "Interactivity is a widely used term with an intuitive appeal, but it is an underdefined concept. As a way of thinking about communication, it has high face validity, but only narrowly based explication, little consensus on meaning, and only recently emerging empirical verification of actual role (Rafaeli: 110)." Jensen, in his seminal text "'Interactivity' Tracking a New Concept in Media and Communication Studies", suggests the use of 'interaction' in its original sociological sense to refer to "actions of two or more individuals observed to be mutually interdependent" (but not mediated communication), and to use the concept of 'interactivity' to refer to media use and mediated communication (1999:200)."

Another dimension of interactivity is its ideologically connotation (e.g. Mulder in Massumi, 2011:47) when it is suggested that interaction is a radical break with all previous 'modern' art, that it is liberating art from its pacifying nature. Interactive technology is sometimes said to have a democratizing effect on the public and therefore contribute to a kind of Habermasian public sphere.

Jensen, in already mentioned essay, responds to the idea that interactivity operates at different dimensions. Interactivity is perceived as a continuum, which seems appropriate and flexible "in relation to the many varied levels of interactivity, the many differing technologies and rapid technological developments (1999:200)." Jensen eventually takes a pragmatic approach to defining interactivity as "a measure of a media's potential ability to let the user exert an influence on the content and/or form of the mediated communication (201)." He then proceeds to divide interactivity into four sub-concepts.

- Transmissional interactivity: referring to "a measure of a media's potential ability to let the user choose from a continuous stream of information in a one way media system without a return channel and therefore without a possibility for making requests". It basically refers to a classic broadcasting setting which I will not refer to as interactivity (at least not in the context of what is here being discussed).
- Consultational interactivity: "to let the user choose, by request, from an existing selection of pre-produced information in a two way media system with a return channel." Consultational interactivity is a common form of interactivity in the interactives here discussed. The maker/producer retains its task as the provider of information, the viewer its position as receptor.
- Conversational interactivity: "a measure of a media's potential ability to let the user produce and input his/her own information in a two way media system, be it stored or in real time.
- Registrational interactivity: "a measure of a media's potential ability to register information from and thereby also adapt and/or respond to a given user's needs and actions, whether they be the user's explicit choice of communication method or the system's built-in ability to automatically 'sense' and adapt."

- ***Convergent***

The distribution of a single narrative across a number of media technologies is intimately linked with the advent of mainstream Internet usage in the nineties. At present the media landscape can be characterized by two seemingly contradicting principles: fragmentation and convergence (Lister et al: 202). Both can be found at the economic, psychological (See for example Jenkins, 2008) and technological level. Fragmentation is when a production (for example a movie or a television series) comes with a selection of added products. This can be websites, forums, video games, apps, but also non-digital items such as magazines, board games, toys and so on. This represents multi-platform distribution. The technological dimension of convergence refers to the phenomenon of a stand-alone appliance or 'black box', that contains in itself integrated forums, games, info-graphs, QR-codes, video, animation, etc. Annemieke de Jong, senior policy adviser at Sound and Vision summarizes the consequences of convergence: "*De convergentie in het mediadomein zal de traditionele grenzen tussen genres, programmacategorieën en distributiekanalen doen vervagen* (De Jong: 2005,85)." It is to be expected that new media productions will continue to be spread out over multiple media platforms.

- ***Networked***

For centuries, cultural heritage material existed as objects: books, articles, film, photographs, paintings, sculptures and so on. Whether digitized or not, these objects retain their isolated, separate status. If the Internet is solely being used as a distribution medium, as is the case for example in video-streams, documents and some games, cultural expressions can remain self-contained. However, especially since the marketing hype called Web 2.0, it is precisely the networked capacity of the Internet that is being employed by artists, website-builders etc. The created object is (hyper)linked to other objects to such an extent that it becomes difficult to determine where the boundaries are.

Hyperlinks form the basic structure of the Internet as it was intended: a library in which documents and parts of documents were linked together (Lister et al, 424) through which a user could determine his or her own trajectory. Hyperlink and hypertextuality are challenging concepts because the exact boundaries of a document or 'text', for example a website, can be disputed. Integrated social media feeds, forums, hyperlinks, participatory functionality; they all obliterate the objects' boundaries in different degrees. At present these boundaries are mostly determined by looking at the URL.

Even though there are some challenges with self-contained productions, they are relatively easy to incorporate in existing preservation workflows. The focus here is on the networked productions.

- ***Participatory***

I am here not referring to participation in the ideological or cultural sense, where the debate revolves around the notion of the democratizing effect, or the expansion of the public sphere, that is possible through the use of Internet technology. I use participation to refer to the viewer's or user's ability to add information, in the form of text, pictures or video that is then added to, or included in the actual production. This falls under Jensen's category of conversational interactivity. There are different modes of participation. Professor of Media theory Joost Raessens (2004) mentions deconstruction, reconfiguration and construction as possible modes of participation in games, but these are also applicable to other forms of participatory media use, such as in interactives.

- ***Interactive navigation***

Interactive navigation largely takes place in the consultational dimension of interactivity. It is a medium's potential to allow a user to choose from a selection of information in a two-way media system. This is a very common characteristic of interactive documentaries for example. They often combine video, speech, photographs, documents, etc. to give a full 'archival' experience of historic events. A lot of the material being offered is secondary or optional to the story that is being told and a viewer can therefore determine the length of his or her reading experience.

Interactive navigation can also take the form of navigating a three-dimensional world, for example in a game. This can happen from any number of perspectives, each displaying different levels an immersive experience.[9] The degree to which immersion is experienced also depends on the interfaces, both hard- and software. Controllers with haptic feedback, Head Mounted Displays, photographic realism, the degree to which interaction is possible, etc.: these all contribute to the immersive experience.

- ***Hardware dependent***

Unlike works of art, in which a specific hardware configuration of an installation is more often than not part of a work, 'mainstream' online media productions normally run on hardware that is widely available. For the last two decades the personal computer, with mouse and keyboard, has been the dominant interface. More recently, however, the possibilities for input into the system are being expanded through the introduction of touch screens, voice control and kinetic input (gesture input), QR-codes, bar codes and image recognition. When the functionality or aesthetic of a production is tightly bound up with its dependency on this hardware functionality, it should at the very least be documented in some way. More on the way in which to do this in chapter five.

Conclusions

It is unlikely that we will come up with a definition or categorization in the short term that will have the final say in the rapidly developing new media landscape. By constantly looking for an ultimate category cultural heritage institutions can even become pacified. Simply engaging with the objects at hand on a more pragmatic basis seems to be a more appropriate response in this transitional stage. More will be said on this attitude in chapter seven.

The quest for a legitimate archiving strategy for interactives should never get hung up on a discussion of what exactly interactivity is. Although clarity does help it is not necessary to begin preservation. The properties such as have been proposed in this chapter can function as a tool to envisage protocols and workflows as I will expand on in chapter five and as is incorporated in the protocol in appendix 1. Again it must be noted though that the properties used in the protocol are dynamic concepts and are to be used like that.

[9] Immersion is being defined by Janet Murray as follows: "Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus." (Murray, 1997: 98)

2. Institutional context of interactives in the Netherlands

Introduction

In order for cultural heritage institutions to relate to the emerging field of new media production it is important to understand the different spheres in which these productions circulate. What is required in acquisition is very much a 'go-to-them' mentality: producers of new media content are always moving on the edge of technological developments and ordinarily have a limited interest in the value their products represent as cultural heritage. The challenge then is to find the producers of interesting interactive material, both professional and amateur. This chapter tries to paint a broad picture of the institutional context of interactive AV content.

During this research period Virtual Platform has published an overview of 150 of the major players in the field of digital art and culture in the Netherlands, divided into medialabs, festivals and game companies.[10] My focus therefore will not be to identify the individual players, but to characterize the field at large. Also, the public broadcasters of the Netherlands have traditionally been the focus of Sound and Vision's collection policy. This chapter will therefore pay specific attention to their role in the emerging field of new media production.

I will begin this chapter by illustrating the current political status quo in the Netherlands and how this influences the field of professional new media production. The rest of the chapter is divided into three parts, each addressing a specific activity that is part of how an interactive comes into existence: financing, production and distribution.

Political situation

The 2008 media-law for the first time allowed public broadcaster to legally distribute their media services through the Internet.[11] At the same time the policy of the last few years, in part due to drastic cuts in the cultural sector, has focused on sustaining the existing distribution through 'old' media like television and radio. Websites are still very much seen as a by-product, which led to legislation telling public broadcasters that websites were only allowed as extensions of radio or television content.[12] As a result about 40% of all public broadcasters' websites are being disposed of.[13] Another result is that usually only a fraction of a total production budget is spent on websites and online activities. It should come as no surprise that a 2012 audience survey showed a poor figure for innovation on behalf of the public broadcasters.[14] The Board of Culture (Raad voor Cultuur) in a 2010 advice to the secretary of Education, Culture and Science, also suggests that Dutch broadcasters still focus very much on television, struggling to really use any of the networked functions that the Internet has to offer. (2010:11)

There is a contradiction between the mandate the public broadcasters hold and their withdrawal on the Internet. On the one hand they are required to use all available distribution channels, to produce a great diversity both in form and content and also to have a wide reach among audiences. Also, the approved multi-annual budget mentions reaching a young audience as one of the spearheads.[15] In all of these instances a clear understanding of the role the Internet could play in reach, but also in viewer participation and interaction is underdeveloped.

These issues show that what the government fails to see is that the boundaries between different media-technologies are increasingly obscured. Television displays more and more of the characteristics of the Internet. High-end TV-sets connect to the Internet, offering on-demand video, 'normal' web browsing and a variety of apps that allow viewers to access extra information (if offered). These services are often referred to as 'net tv'. In what we can still consider a transitional stage, the TV screen is considered as rather inconvenient for most of these applications compared to a 'normal' computer: remote controls are no good for typing search queries and the screen is too far removed from the viewer for touch screen functionality but also for reading text-heavy websites. However,

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[10] http://virtueelplatform.nl/activiteiten/the-new-explorers, 19/12/2012

[11] Artikel 2.1: 1. "Er is een publieke mediaopdracht die bestaat uit (...) het op landelijk, regionaal en lokaal niveau verzorgen van publieke mediadiensten door het aanbieden van media-aanbod op het terrein van informatie, cultuur, educatie en verstrooiing, *via alle beschikbare aanbodkanalen*" (my italics)

[12] Exceptions are allowed but these have to be financed completely by the broadcaster itself. They also need permission from the net-coordinator.

[13] http://www.rijksoverheid.nl/onderwerpen/publieke-omroep/hervorming-publieke-omroep

[14] Meerjarenbegroting 2012-2016 Nederlandse Publieke Omroep, p.7

[15] Meerjarenbegroting 2012-2016 Nederlandse Publieke Omroep, p.20

applications for smart-phones and tablets are developed by television manufacturers, enabling viewers to use these devices as alternative remote controls, allowing for a whole range of new options.

Ten years ago interactive television did not take off in the Netherlands due to a number of problems described in a report by Virtueel Platform and Submarine Channel.[16] At the time there were technological restrictions: the government never interfered with the infrastructure and as a result there was a proliferation of technologies that prevented any form of standardization. Net tv is a much more flexible technology which gives manufacturers the ability to offer their clients a great variety of options. Another reason why iTV never worked was for commercial reasons; the government left the development of interactive television up to the market. There were no viable business models, partly due to the fact that huge investments in the infrastructure had to be made, partly because there was a lack of interesting content for which users would be willing to pay. Today, net tv is making use of the infrastructure that is needed for Internet itself and is therefore already being expended all the time. So the circumstances have changed, and a variety of convergences of Internet, television and also mobile technology are here to stay. What remains though is the difficulty of conceptualizing business models for interactives.

Financing

Viable business models for the Internet are still very much under development. It has proven rather difficult to generate steady revenue streams even with the large audiences that can potentially be drawn. In general we can say that there is not one single way in which to make money from products that circulate on the Internet. Advertising, sponsoring, subscription, crowd-funding and links to existing media productions that already do generate revenue are just a few of the money-making tools that are available to producers. There are, however, big risks and few guarantees, there is a lot of work involved in getting enough reach and participation to make any of these models viable. At present the stance of media producers towards these models of financing can be described as biding. As a result a lot of the innovation and experiments on the Internet rely for a considerable degree on public funding. This can be illustrated by looking at some of the most successful producers of interactive productions; The National Film Board of Canada (NFB), French-German Arte and the Australian SBS: they are all financed with public money. Their 'normal' television content is sometimes sponsored or gets part of its income through advertisement, but this is not the case for their web content.

In the Netherlands there is one public fund in particular that contributes to the development of new media content. Het Mediafonds most notably plays an important role in innovative multi-media productions. Their goal is to stimulate the production of cultural media productions among nation-wide and local public broadcasters. Part of their budget goes into the field of e-culture: in 2011 this was about €800.000 plus €150.000 for game development. The mandate of Het Mediafonds is to stimulate innovation in artistic media-production among national and regional public broadcasters, as a result (and because of the legislation described above) the majority of what they do consists of transmedia projects. They therefore function like a bridge between artists and producers of mainstream media-content. As it is, Het Mediafonds will be shut down in 2017, due to governmental cuts. The public broadcasters have vocalized the intention to take upon them the task of the fund, but makers and producers are concerned that they will not keep their promise. Also, a considerable amount of expertise will be lost.

There are a few other public funds that potentially play a role in the future development of interactives. On January 1st 2013, the 'Stimuleringsfonds Creatieve Industrie' (SCI) was established. Previously known as the 'Stimuleringsfonds voor architectuur', it now also aims to stimulate cross-disciplinary working in the areas of architecture, e-culture and design, which also includes AV production. Another public fund that can play a possible role in the financing of interactive audio-visual productions is the 'Stimuleringsfonds voor de Pers', which focuses on innovation in journalism. A quick look at their recent projects reveals a preoccupation with text-based journalism though. Then there is the European Media Programme (755 million euros) that is mainly being distributed among film- and television production, but there is a small percentage of the entire budget that goes into New Media productions. Local and regional governments can also invest in media-content. The municipality of Amsterdam for example, also contributes to the production of high-quality, innovative media productions by investing in Submarine, a prize-winning production company based in Amsterdam.

[16] Expertmeeting: Innovatie in de Digitale Publieke Omroep: Interactieve Televisie. Virtueel Platform, Submarine. Rotterdam 20 januari 2002

Production

At the institutional level of producers, the categories are unclear as was suggested earlier due to convergences of production contexts. The producers that make the type of productions here discussed often have a background or core activity of making films (fiction or documentaries), advertising campaigns, educational material, games or new media art. The interactives then produced show traces of these backgrounds. For many producers interactive online content is still a side-product. It is within this institutional context that interactive productions are given their diversified medial nature.

The Dutch gaming industry has been relatively successful, with production companies like Geurilla Games, Zylom and Playlogic. Guerilla Games was acquired by Sony in 2005 and their staff is a mix of different nationalities. Similarly, Zylom is Gamehouse's European consumer brand. As a result it is difficult to designate one of their productions as 'Dutch', one of the requirements for selection at Sound and Vision. So far games are not yet part of any of the 'official' cultural heritage collections in the Netherlands. Another trend that has taken roots in the Netherlands are serious games and educational games. The artistic value of these games is normally limited, but their value as cultural heritage must be seen along the lines of what they tell us about important changes in education.

The Dutch public broadcasters find themselves in the previously described legal situation. Even if they do produce online materials, they often do not have the expertise to run the projects in-house. They would normally work together with production companies that specialize in the production of interactive online content, such as Submarine or IJsfontein. These companies are built up out of a variety of creative disciplines: interaction designers, graphic designers, animators, programmers, camera operators, editors, etc. Depending on the degree to which a production changes through participation, a production company will also be involved in monitoring user activity, or introducing new material to the previously established format.

Distribution

Again the concepts of convergence and fragmentation capture very well the way in which distribution takes place in the digital era. Various technologies, in changing combinations are used to bring a production to its public. The Internet as a distribution medium is accessible to both professional and amateur producers of content. However, it cannot be approached in the same way as a single medium like television. The Internet is comprised of an enormous and ever expending collection of distribution channels.

For non-professionals, platforms such as YouTube and Vimeo facilitate amateurs to publish their own video content. Wordpress, Wix.com and other publishing services facilitate blogs and websites that are easy to maintain due to accessible Content Management Systems, that allow increasing amounts of interaction. Recently, some online editing programs for the production of interactive stories have become available, such as Klynt[17], Storyplanet[18] and Zeega[19]. The productions made using these programs are either distributed through normal websites, or hosted on the portal of the editing program.

News websites, such as the Dutch website of NOS (a public newsbroadcaster), Geenstijl.nl and nu.nl, also contain original video-content, that will not be shown on television. Though the videos themselves are not interactive, they do have possibilities for interaction in their close proximity. Viewers can link through to relating videos, can comment on the videos and can share the videos on social media with a click on a button.

Conclusions

The different stages of production each provide different types of information and a different perspective on what to archive. Financing, production and distribution all need to be taken into account when developing a preservation strategy for new media content, such as interactives.

It deserves recommendation to establish close links with the public funds, especially in a stage where the validity of commercial business models has yet to be proven. The funds have a lot of expertise in selecting high quality production-proposals and can therefore play an important role in (pre)selecting productions for preservation. They are also in a position to make funding contingent on the producers willingness to cooperate in the preservation of their work.

[17] http://www.klynt.net/
[18] https://www.storyplanet.com/
[19] http://zeega.com/

A narrow focus on the institutional context of public broadcasters is not sufficient if Sound and Vision wants to play an important role in the conservation of digital culture. To develop a clear acquisition strategy a networked approach is critical. Collaboration with financers, research platforms such as Virtueel Platform and calibration of collection policies with other archives are all pieces of the puzzle to achieve maximized efficacy in a very complex, fragmented field.

3. Analytical concepts for interactives

Introduction

In chapter one we introduced a number of definitions of interactivity and tried to narrow down what productions we are talking about when using the word interactives. We concluded that a categorization is severely complexified because of convergence of genres, media-technologies, but also as we saw in chapter two, on the institutional level. Before we can address the question of preservation we need to answer the question of how we can understand, discuss and analyze interactives. Analysis serves two goals in the context of preservation: first it helps us to determine more precisely what we are talking about and what method of preservation is needed to preserve the production at hand in such a way that future researchers can understand the full scope of what these productions entail. Second, in the analysis of a production, the archivist tries to move away from subjectivity, towards a rational and falsifiable argumentation (Machiori, 2013:130) that can form the basis for a catalogue description. I will suggest that we need to understand interactives as relational and processual and as constituted primarily by its networked context.

From signification to pragmatics

Historically, much of the analysis of media-content has had a strong focus on meaning. It followed representational linguistics in its assumption that there is a fundamental separation between reality and representations of that reality, between language and its meaning, between signifier and signified. This structuralist approach is most notably a starting point for Roland Barthes to consider ideology in relation to mass media (e.g. 1981) and Christian Metz uses it as a tool for the analysis of film (e.g. 1964). The focus of this approach is more on people and society and the subconscious patterns of thought and behaviour that are at work than on the media expressions themselves. These are strictly approached as a point of entrance.

There are two issues with this approach that also have relevance to preservation in general and more specifically to the preservation of interactives. First, when interpreting media expressions in this way there is a risk of being overly subjective. The hidden or underlying meaning is always an interpretation at a single point in time and as such they can be quite selective.[20] Archives are then at risk of presenting future generations with a coloured perspective on present day culture. I am not suggesting that a fully objective archiving strategy is possible, nor do I think it is desirable to leave out entirely the meaning we at present assign to artefacts. Our focus should be though to try to make clear the distinction between these interpretations and the thing itself in order to avoid overly personal interpretations in preservation practice. Interpretation should only be seen as one step in the whole process of analysis. Machiori discerns four stages of analysis: description, analysis, interpretation and judgment. In the case of many archives, the last two stages are only performed in some cases, such as for publications, or exhibitions. It is a step that is more often performed by academic researchers and people that reuse the assets in other contexts.

Another issue with the focus on meaning as a reality separate from its referent, is that it fails to give an understanding of the processual dynamic we find in interactives. Of course this is not only true for interactive media productions, but also for any human-to-human interaction or even human-to-machine interaction. The process of one dynamic entity engaging with another one can be best described as conversational. A helpful corrective to the representationalist paradigm described above would be to look at models for conversation analysis, such as pragmatics, where attention is paid to the context (time, place, actors, etc.) in which an utterance is being made. The question that pragmatics tries to answer is not so much 'what does it mean?' but 'what does it do?'. John Austin's *How to do things with words* (1955) is the start of a focus on this performative quality of language.

The appreciation of context can serve as a helpful starting point for the archiving of web-content in general and interactives in particular. By way of example we could look at the collection of Internet videos Sound and Vision holds. These videos are crawled from video portals like YouTube and Vimeo, but without any reference to the original, information-rich context in which they occurred. Commercials, banners, comments, ratings, number of views... all of these elements are lost. Each of them could potentially add valuable information to the object, revealing the conversational nature of a

[20] A similar critique in the field of film studies is expressed by David Bordwell (1989). He refers to the representationalist paradigm here described as SLAB-theory and points out that it is centered around certain doctrines, that it doesn't have a systematized research method and that it seeks to construct narratives, rather than simply explain the film.

user's engagement with online content. It also gives a much better sense of the way in which the Internet works socially and economically.

Cybernetics as an analytical framework

What structuralist models fail to do is move beyond the analysis of the production of meaning. As Roy Ascott, a new media artist, states a "work of art or production (...) is not merely a carrier of meaning, it is a catalyst and a matrix of human behavior. The production is part of a broader network. The participational, inclusive form of art has as its basic principle "feedback", and it is this loop which makes of the triad artist/artwork/observer an integral whole." (2002:106) This 'integral whole' should be central to our analysis. Structuralist approaches also take text, context and reader as pre-given, stable entities; at least for the duration of the reading experience. They are therefore less adequate for the analysis of what takes place in interactives. A final shortcoming of structuralist models is that they focus on human-to-human communication without considering the impact of the constant mutual communication that takes place between machines in the interactive productions on the Web. These need to be understood as a, what Katherine Hayles calls, "'dance' between code and language" (2010: 327). To better understand the dynamic nature of interactives I will discuss cybernetics as a tool for analysis.

The history of cybernetics can be traced back to the early years of WWII where Robert Wiener worked on the development of an automatic range finder for anti-aircraft guns. The system predicted the trajectory of an aircraft by considering past trajectories. The feedback loop system soon became a way of describing biological mechanisms, neurology, and as the first computers were developed it became a standard for computer science. It also became an influential paradigm for philosophy (see for example Katherine Hayles: 1999). The focus of cybernetics is not so much on machines or things, but more on their way of behaving. According to Ashby, who wrote an influential work on cybernetics in 1956 it answers the question: "what does it do?" (1957:1). It considers them in their relation to their respective environments. It is therefore particularly apt for the analysis of digital networked technology. One of the affordances of this technology is that it can facilitate navigation through a large quantity of data by following different trajectories depending on user input. Ashby writes: "cybernetics typically treats any given, particular, machine by asking not "what individual act will it produce here and now?" but "what are all the possible behaviours that it can produce?" (1957:3)

Cybernetics has also found its way into the analysis of new media art, to engage with the dynamic nature of the objects of research. Mark Hansen for example quotes Lévy:

> "the [new media] artist now attempts to construct an environment, a system of communication and production, a collective event that implies its recipients, transforms interpreters into actors, enables interpretation to enter the loop with collective action (...). [T]he art of implication doesn't constitute a work of art at all, even one that is open or indefinite. It brings forth a process.... It places us within a creative cycle, a living environment of which we are always already the co-authors. Work in progress? The accent has now shifted from work to progress." (2007:144)

By definition this makes for obscured boundaries between the production, the producer and consumer as was discussed in chapter one. In the analysis we therefore need to consider the relationships that are formed as much as the product of their interaction. This will change the way in which documentalists describe and archive productions.

To return to the four stages of analysis that Machiori discerns. The first is description, which serves "to give a simple and homogeneous recollection (mental image) of an object, person, event, activity, or process (or parts of them)." (2013:132) This descriptive level has always played a fundamental role in the attribution of meta-data to productions in the catalogue. With the cybernetic nature of interactives in mind we can conclude that the second stage, analysis, will have a more prominent place in the entire process of analysis. "The analyst tries to understand the structure of the artwork, to make explicit the functions of its components, to explain its operational processes." (135) This is for example what Rinehart's formal notation system tries to do:

> "This formal notation system may not describe the artistic process per se, but should be able to describe the work as set of intents expressed as parameters and manifested as a product or occurrence. It should be descriptive of levels of agency and choice within the work, allowing

for a continuum of assignable human or automated roles from creator to user." (2005: 3-4)

The interactive as an event is a techno-social constellation. Agency can be distributed in varying degrees between human and technological components. It can be temporarily delegated to one or the other and be expressed through human cognitive decision making or the numeric logic of algorithm. The ontological nature of interactive media-content lies precisely in this dynamic.

The classic philosophical distinction between form and function, between medium and content has been challenged time and time again. McLuhan's radical "the medium is the message" is echoed by Miquel Dewever-Plana, maker of the interactive documentary ALMA (2012), who claims that "interface is content". Understanding interactives, and therefore preserving them, cannot refrain to a mere description of how things look or the content they contain. It needs to thoroughly analyze the 'operational processes' that make the interactive production function the way it does.

Conclusions

Cybernetics offers us a useful analytical tool that can help us understand the way in which interactives function. It moves beyond mere signification of fragments, but considers the way in which these fragments relate to each other. It takes into account the agency of both machines and human actors and by doing so it stimulates a more holistic and contextual view of interactives.

4. Preservation goals and designated communities

Introduction

The very first question that needs to be asked before proceeding to any preservation plan is to determine the 'designated community' mentioned in the Plato preservation tool. In this chapter I will distinguish between largely four designated communities that are expected to use archived interactives in different ways. The first group is made up out of academic researchers from different fields of study. The second community is in the area of professional media production. Third, the general public will be considered as a user group for archived interactives. The last user group consists of various institutions active in the educational field. The goal of this chapter is to provide us with the framework that allows us to make a well-founded judgment about which method of preservation to employ to serve the needs of the different communities.

Academic research

Sound and Vision has seen an increasing interest from the academic field in the last decade. This is an achievement in part due to improved accessibility of (often digitized) assets, but also a result of the improved personal and institutional relations between universities and the archives. This last point can be illustrated by the chair that Bert Hogenkamp holds as Professor at the VU University of Amsterdam, whilst employed as a media historian at Sound and Vision. The aim of this chair was to challenge historians to engage with the assets held by the institute, by showing them that audiovisual material presents us with a rich source of information.

What by now will have become clear is that interactivity in its diverse forms is a factor in a lot of the audiovisual material that is produced today. It is no longer a phenomenon in the margins of society: It is being used by artists to generate certain effects, by producers in the film and television industry to increase audience participation and by commercial enterprises to develop new marketing strategies. As we have seen interactivity also carries a strong ideological connotation and is sometimes said to have a democratizing effect on society. For these reasons academics from a variety of disciplines now and in the future can be expected to study interactive audiovisual content as an expression of culture in its broadest sense. This holds true for media studies in a very obvious way; they would simply want to be able to see developments in media technology, cultural practice surrounding these technologies and the way in which these relate to society at large. Jeff Malpas, professor of philosophy, argues: "While the artwork does indeed constitute a certain type of cultural heritage, the materiality of the artwork exemplifies a materiality that is characteristic of culture, as well of that which we refer to as 'cultural heritage'. The artwork is not reducible just to the material 'stuff' of which it is made, and yet the artwork is what it is through its concrete spatio-temporal existence, its placed presence (2008: 16)." The technology itself therefore should take a prominent place in the conservation of interactive content, either by storing the technological context (both hard- and software) through what we will call technological hardware preservation (see chapter five) or by way of description/ documentation. The first option is preferred by theorists engaging with the relatively new research field of media-archaeology, or if it concerns online media forms, web-archaeology. It is an "epistemologically alternative approach to the supremacy of historical narratives" (Ernst, 2013:55). It is an object oriented approach to media and takes a strong interest in the materiality and physicality of media technologies. It does include a range of perspectives but what they have in common is that they focus on the agency of machines. Names that are associated with media-archaeology are Kittler, Huhtamo, Ernst and Parikka. They stand in a longer tradition that considers materiality and technology as what has a considerable impact on a culture, such as Foucaults' consideration of prisons, or McLuhan's ideas on television.

Historians are also interested in the material and technological expressions of culture but will normally focus on the content, context and relations between different cultural expressions. According to Historian Karel Dibbets the time that archives existed primarily for historians is long gone (Dibbets, 2005). Archives now focus a lot more on education, entertainment and tourism. This is in part due to political demands that require heritage institutions to reach a wider audience. Dibbets mentions audiovisual archives that specialize in stockshots; they divide their collection into separate segments that are then offered for reuse. Conservation is being replaced by information management with little attention for the integrity and coherence of the collection and a lack of context information and secondary sources (193).

As a historian, Dibbets is obviously not very positive about these developments. He mentions the Dutch Theatre Institute (TIN) as a positive exception. Because TIN does not have an actual object

to preserve because of theatres' performative nature, they hold a collection of items that contains information about the performance: scenography, scripts, costume-sketches, advertising, etc. They have become experts in collecting context. Dibbets refers to this setting as a "paradise for historians (190)", because historical sources do not carry meaning in themselves and context serves as a 'glue' between individual objects.

In the last few years so called 'digital humanities' or 'e-humanities' presents us with a new form of historical research through its engagement with enormous amounts of digital information that can be analyzed through data mining.[21] So far this has mainly been possible for text-based data-sets, but tools are being developed like voice, speech and image recognition (such as developed in for example the CATCHplus projects[22]) that potentially allow researchers to use similar research methods on audio-visual material. This so called 'big data' can be divided into sets that can serve as source material for quantitative research. Even with these new tools there are still some challenges to be overcome before this can function as a research method for questions from a humanities perspective. In audio-visual material the context, meaning and syntax are far more complicated than in a written text. The cybernetic nature of interactive content discussed in chapter three adds to this complexity. Digital humanities still needs to prove itself for interactive content and in general is a fairly new field that still needs to be developed further. It might lead to a focus on collecting huge quantities of material, rather than collecting qualitatively more in depth (by adding secondary sources, contextual information, etc.). This is a debate that yet needs to take place and in which cultural heritage institutions will have to take a position. These upcoming methods will have to be considered and anticipated on in the development of new interfaces and cataloguing systems.

The previously mentioned media-archaeological approach and digital humanities can be at odds with each other if it comes to the priorities that cultural heritage institutions set for the future. Limited resources can only be spent once, and facilitating for researchers from both perspectives might prove difficult. In conclusion though we can say that what academics need apart from the object itself is context information, information about use, (information about) original technology and if possible access to big data.

Professional production

It is in this area that we find yet another difference with art preservation. The reuse of parts of works of art is quite rare, whereas it is common practice in media production to use fragments of stock footage. This is a service provided by Sound and Vision at present where it comes to the redistribution of television footage. It is a very important aspect because for many people it is the most visible merit that shows the relevance of archiving historical footage. For the general public this then legitimizes the existence of institutions such as Sound and Vision. It is also greatly appreciated by the international archiving community. The BBC's Creative Archive (a pilot that ran up until 2006) that made archival assets available for reuse under the Creative Archive License) for example had a strong focus on reuse, which was much appreciated as a progressive stance that helped the public to develop deeper media literacy. The question is: will there be a need for the redistribution of (parts of) *interactive* audiovisual productions in the future?

In talking to public broadcasters, funding organizations and producers I have at present not found a great amount of interest in the reuse and redistribution of online interactive content. Arguments that were given ranged from a 'lack of quality' of the retrieved asset (a problem that might be solved in the future) and a small target audience due to the timely nature, to changing hardware with the impossibility of adapting productions to the most recent media technology. At most they could envisage the reuse of linear audio-visual parts of interactives, such as video-fragments, that could then be remixed with other material or be presented in a different form. What producers need then is easy access to the highest possible quality of linear elements of interactive materials. From their perspective there is at present no need to store the original interactive experience. Also, information about the copyrights that are relevant to the particular production should be kept in close proximity of the production and be accessible for producers.

[21] Discovering patterns in large quantities of data
[22] A project running for 3,5 years in which Sound and Vision is a partner: http://www.catchplus.nl/

General public

The general public is of course an incoherent group. There are different age groups, degrees of expertise or interest in particular genres and a variety of social backgrounds. It might therefore be necessary to determine the *dominant* user groups for a particular production or group of productions.

In general though we could say that for the public a sense of the historicity of assets must be made felt. It should be possible to redistribute the archived objects in exhibitions or possibly online if the copyrights allow it. The interactive experience itself can be expected to engage future audiences, much in the same way as old arcade games can still draw audiences. A description or video of the production might lack this 'historical sensation' and therefore might not succeed in drawing an audience. As a general rule we could probably say that the entertainment value of a production is what makes it of interest to a general public. This means it must be fun or of artistic value.

The original reception and popularity must be visible; both at time of transmission as well as popularity in the archives. The search results in the catalogue must be organizable by popularity. We need systems that record users' activity and that allow them to easily share about their experience or comment on assets. Also, infrastructure should be in place to allow users to have an influence on the collection policy. This can be achieved by rating systems, participatory wiki's, etc.

Conclusion

We must think of ways to involve the users of archives in the collection policy. They each have different desires when it comes to what is being archived, as well as how it is being done. This was already true for linear content, but with the variety of forms interactives can take this problem has exponentially grown. The demands that the different user communities have are varied and sometimes even at odds with each other. Cultural heritage institutions are facing the challenging task of providing each of the users with as much required information as they possibly can. Involving the designated communities we know at present in the selection process, and also in determining the archiving method is key, Stanhope and Poole write: "what we believe we are heading towards is an age in which the user isn't at the end of the process, but is intimately written into every part of it."[23]

Great flexibility is required if an audiovisual archive is to cater for all the designated communities here described. In the next chapter I will discuss the different preservation strategies or methods that are available at present and the way in which they fulfil the needs of the users of archives.

[23] http://www.collectionslink.org.uk/discover/new-perspectives/1402-the-participatory-museum 18/4/2013

5. Preservation methods for interactives

Introduction

In this chapter some of the possibilities for the long-term preservation of interactives are explored. These will be evaluated based on the requirements of the user groups defined in chapter four. We have determined that interactives appear in many file formats, using a variety of the hardware options that are presently available. They are dynamic and do not take on a final form. The links they make with other entities make it difficult to determine the reach or scope of the production. Essentially we are left with the question of what to archive. In this chapter I will first look at the possibility of archiving the object itself by using tools like crawlers, emulators and migration-tools. An attempt has been made to get as clear a picture as possible of the IT solutions that are currently available. However, this is a very complex field with a lot of players, both commercial and subsidized. Also, it is a rapidly evolving area of research and therefore it remains to be seen whether new solutions are developed soon after the publication of this research paper. In the last part of the chapter I will deal with the importance of documentation either as a replacement for archiving the actual object or as a necessary addition to other preservation methods.

Acquisition

A-posteriori: Crawling the Web

Archiving relies on the assumption that an object can be accessed in such a way that is can be 'harvested', i.e. retrieved from its place on the Web, and be contained in a single file or folder. In the OAIS model this is indicated by the 'ingest' stage. In the case of online distribution ingest normally takes place through a so called web crawler. There are IT solutions being developed for this. The most advanced options that I have been able to find are the Net-art Router and the solutions by Hanzo Archives. The first is a Swiss initiative, subsidized by among others the Swiss Institute for Art Research and the 'Bundesamt für Kultur'. According to the website the Net-art Router "takes on the router protocol meta-data (http-requests, http-reply-headers, including cookies), as well as the data and visited / browsed objects that were called during the session documentation. All data, including Java applets and Flash movies are stored in a structured database." Hanzo Archives is a commercial enterprise that offers its services to businesses in the preservation of what they call "corporate cultural heritage". They too claim to be able to harvest dynamic AV-content, like javascripts, Flash, etc. A further crawling solution is being developed by BBC archives in collaboration with the British Library, which is expected to be rolled out in 2013.

Because of the intricately linked nature of web productions, the depth of harvesting must be determined. This might have to vary from one production to another, depending on the degree to which a production is depending on its network-context. A challenge might be to harvest material from password protected domains, such as Facebook. Also, crawling can be prevented by a Trusted Platform Module (TPM), which is a microchip that secures data.

A-priori: Approach producers

Alternatively, or in addition to a-posteriori archiving, archives could attempt to acquire materials ahead of final distribution. One advantage of this approach is that linear or audiovisual components can be acquired separately in high quality. Another advantage is that archivists have the ability to directly communicate with producers about the technological requirements of the production (hardware and software). Also, when crawling java-scripts and flash-elements is impossible, producers can provide archives with original source codes, files and file-structures. Finally, additional context information can be added based on the information that circulates in the production environment, which ranges from actual production documents to data about reception and use.

Technological hardware preservation

Technological preservation comes down to storing both the AV-production itself, as well as the technological infrastructure on which it was originally shown. In the case of the works here discussed

this would not only include the hardware; computers, screens, controllers, etc. but also the original software environment; the operating system, web browser, etc. Besides saving the environment, the actual productions of course also have to be saved in their original file-format and file structures. There are a number of advantages to this way of working:

- It is possible to retain the original interactive functionality, and therefore have the same look and feel. A future user can get a good idea of how a production worked, not just by reading about it or seeing it, but by experiencing it first-hand. This functionality is lost in some of the other solutions as we will see.
- The materiality of the production is safeguarded. This has come to be widely appreciated as an important expression of culture. As Malpas correctly states, the distinction between material and nonmaterial heritage is somewhat artificial. “Culture is always tied to its materiality and is inseparable from it (2008:14).” Even more so in the digital age where symbolic code can only be accessed through the interface of computer hardware. Programming, which is often an important part of the production process may seem immaterial, but it depends on and is articulated by means of specific instruments. It is for these reasons that technological preservation would be a valuable contribution for the academic user-group that we defined in chapter four. Especially media archaeologists, with their fascination for the materiality of media, are guaranteed to profit from technological preservation.

Despite the desirability of technological preservation there are a number of disadvantages that might well prevent cultural heritage institutions from choosing this form of preservation.

- It is expensive. A collection of computer hard- and software requires constant care by experts in this area. The hardware itself must be bought, as well as spare parts, which can sometimes be expensive collectors items.
- It is not a feasible solution in the long run due to decay and storage-capacity. At some point the equipment used will show signs of decay, which in the case of a computer often means malfunctioning, and spare parts will at some point run out. Also, the lifespan of computers is incredibly short due to rapid developments. A collection of computer hardware would simply outgrow most storage locations in no-time.
- Material is only accessible on-site. At present cultural heritage institutions are by law permitted only to give access to material on library premises (more on this in chapter six). However, technological preservation excludes the option of ever making productions available online, even if copyright laws would be changed or rights to production could be acquired from the rights holders. Here it shows that technological preservation is not purposed for reuse and redistribution and therefore it will not be accessible to the professional producers and the general public.
- A final problem that is not solved by technological preservation is found in the networked nature of the interactives. They function in a very specific context on the Internet, they can depend on external databases and UGC to such an extent that the functionality and aesthetic of a production will be drastically impacted when these links are cut off.

Technical preservation then does not seem to be a viable preservation option for the long term. It cannot be written off entirely though. That doesn’t mean however that every archive should have their own hardware collection. Collaboration with other institutes can be a solution. In the Netherlands there are organizations that preserve computer hardware. The University of Amsterdam for example maintains its own computer museum (UvA Computer Museum) which excludes home-computers and game-computers however. There is also a foundation called ‘Stichting Computer Museum’ that does hold PC’s of for example IBM, Apple and Philips. In individual cases an attempt could be made to cooperate with these organizations for research and presentation purposes. Large scale accessibility is not an option though. Migration and emulation are two preservation methods that can be used to adapt productions to current technology and by doing so making them available for large scale distribution.

Migration

Migration is the activity by which an older digital file-format is transformed or transcoded into a newer file-format. This requires either a piece of software that can both ‘read’ the original file-format and translate it into the newer file-type (automated migration), or a human agent that re-programs the

whole production into a more recent file-type. This current file-type can be kept as a 'new vernacular rendition' (a term by Rotherberg) next to the 'original' file or it can replace the file altogether. Automated migration is becoming common practice in digital preservation of linear audiovisual productions. However, it remains to be seen whether automated migration is a possibility for the complex, varied file-formats that make up interactive web content, such as Flash, Java and HTML5. There are a number of advantages to this method of preservation.

- It is possible to retain the original interactive experience for future users (with certain limitations as we will see).
- Online distribution for re-use is a possibility and easy due to adaptation of production to the latest software standards and technology that is common among a general audience.
- Hardware obsolescence is not an issue.

Some of the disadvantages:

- Hardware functionality can be lost which results in a production that doesn't work the way it used to work. To name just one example: the mouse has been around from the late 60's as a device for interaction with the computer. With the current increase in the amount of touch screens in our surrounding, the future of the mouse is unsure. This could mean that the 'point-and-click' experience of a lot of productions from today would be lost and a decision would have to be made about the way in which the production can proliferate under new computer technology. Migration would therefore include a process of re-interpretation.[24]
- It can be inadequate in portraying details like colour and screen resolution; thorough checks are needed to see whether the visual qualities remain unaffected.
- The customized approach that is needed makes migration a very expensive undertaking for interactive content. It also requires perpetual attention, with periodic cycles of migration each five to ten years (and still more might be needed in the future).
- This solution also does not solve the issues with the networked nature of interactives.

In short we could say that although migration might play a role in preservation, it is not a viable preservation option for large-scale automatized work-flows for the preservation of interactives. [25] Henriksen et al also conclude that migration might very well affect the functionality of complex, software-based art. They suggest that a more complex procedure is needed, such as emulation (28).

Emulation

Also referred to as virtualization (Henriksen et al, 2012:6), emulation is concerned with the preservation of the original software environment as well as the original code or data. POCOS refers to emulation as a data-centric approach. The emulation software mimics an original operating system or programme (such as a web browser) in which the production originally played. Emulation has been the object of research for a number of projects, such as KEEP[26] and PLANETS[27]. The KEEP Emulation Framework (in the present release, 2.1.0) supports six hardware platforms, such as x86, Commodore 64, etc. as well as a range of emulators. The EF can potentially be expanded with other emulators.

There are a number of advantages to this approach:

- It is possible to retain the original interactive experience for future users
- The customized approach that migration requires when it comes to more complex objects can be replaced with more automated workflows.
- When scaled, for example by cooperating with other institutions, it is a relatively cheap option.
- Projects such as KEEP have made emulation potentially portable. In other words; users of the framework do not need to install the software on their own computer, but can use it as a cloud service.
- The original code is kept, which might add to the authenticity or aura ascribed to these artefacts.

[24] See also Ippolito: "This strategy takes the greatest liberties with the original, but also represents the most flexible approach to cultural as well as technical obsolescence (2003:52)

[25] Baker en Anderson of POCOS, (Preservation of Complex Objects), a series of symposiums in the UK, conclude that: "migration is not a viable option particularly in an institutional context" (16).

[26] http://www.keep-project.eu/ezpub2/index.php, as seen on 14/5/2012

[27] http://www.planets-project.eu/, as seen on 14/5/2012

Challenges for emulation

- There are copyright issues on software emulators as is pointed out by Becker et al.[28] Permission is required from the company that originally created the software. In the experience of Jeffrey van der Hoeven, project manager digital preservation at the Koninklijke Bibliotheek, these companies might be willing to cooperate in small scale research projects, but are likely to object against widespread implementation.
- A further challenge is the question of responsibility: who will preserve the emulator? Geoffrey Brown addresses this issue in a recent article. He concludes that what is necessary to have a 'preserved' emulator is two layers: one is a reference platform (he suggests a standard PC running Ubuntu Linux circa 200x, because it is both open source and supported by multiple emulators) and then an emulator, such as Sheepshaver, running on top of that.[29]
- Hardware functionality can be emulated or simulated by software. The Emulation Framework discussed above at present does not support this feature, but potentially it could include a number of hardware simulators, such as an on screen joystick, mouse, keyboard, etc. The look and feel of original material context would be lost but the functionality would not be affected dramatically.
- Again, the networked features that interactives might entail cannot be safeguarded. Where they influence the way in which a production works, this functionality will be lost. An attempt could be made to harvest a sample of the databases that are being used by the production, in order to mimic the original functionality. But the connections are potentially endless. David Rosenthal on his blogs writes: "No matter how faithful the emulator may be, almost all programs these days execute in a context of network services, which themselves execute in a context of network services, and so on *ad infinitum*. Simply preserving the bits and the ability to re-execute them is not enough if the network services the bits call on are no longer available, or return different results."[30]

In conclusion we might say that emulation can make a valuable contribution to the preservation of interactive, born-digital material. It is not yet a very mature and developed method though, and even if it would be further developed it could never be the only method applied.

Documentation

Documentation is often mentioned as a further preservation option or an addition to the methods described above (e.g. Henriksen et al: 6). There is a subtle paradox to documentation; on the one hand it will never be the same as preserving the actual object, there are always elements that are lost in translation. At the same time though, documentation adds information to the object, especially when it comes to the way in which it was experienced by its first viewers (see also Dekker, 2013: 151). Documentation, however, cannot be understood as a single thing. It is broken up into a number of options or actions that differ quite fundamentally. We must therefore specify what we mean when we talk about documentation.

First we can distinguish between goals for documentation (See also Dekker, 2013: 153). It can be done with the sole purpose in mind to reiterate the work when required. In other words to describe the functionality and aesthetic in such a way that what is lost can be re-interpreted, which is the case in for example manual migration. This type of documentation is called Preservation Description Information (PDI) in the OAIS reference model.

Another goal can be to trace back the preservation actions that have been taken in order for future users to see why the object is preserved in the way it has been preserved. This one could call self-reflexive documentation. This is an important step because the decisions made by archivists can be distinguished by those made by the maker or artist.

Another purpose that could be served by documentation is to improve accessibility. If a production is available in its original interactive set-up the time it might take to emulate this and check its functionality might reduce the accessibility. If a screencast, pictures or a textual description are available these can serve as a first point of access. There is also a risk to easy accessibility of documentation. Arie Altena, curator at V2_ unstable media, shows how online documentation in the end might be the only way in which the work "exists" for an audience (2013:358). The documentation

[28] Becker, Christoph. Günther Kolar, Josef Küng , and Andreas Rauber. "Preserving Interactive Multimedia Art: A Case Study in Preservation Planning" in *D.H.-L.* Goh et al. (Eds.): ICADL 2007, LNCS 4822, pp. 257–266, 2007.
[29] Brown, Geoffrey "Developing Virtual CD-ROM Collections: The Voyager Company Publications"
The International Journal of Digital Curation Volume 7, Issue 2 | 2012
[30] http://blog.dshr.org/2013/02/rothenberg-still-wrong.html. 14/2/2013

then becomes a product in itself, which might be confused with the work. It also possibly leads to an inflation of the original work (Henriksen et al:6)

Finally, documentation can be done with the purpose of preserving the original socio-historical context of the production and by doing so enrich the experience of users of the archive. This purpose is normally best served by a textual description that answers questions about who, where, when, what and how. Usually, documentation is done with a combination of the goals here described in mind.

Documentation can also be performed from different perspectives:

- ***Artist intent/production***

This perspective plays a particularly big role in art preservation where the authenticity of a work is often linked to a message that an artist wanted to convey with it. Also in the arts safeguarding this authenticity does not only translate into cultural value but also represents sometimes enormous economic value by the museum that purchased the work. It makes sense that Henriksen et al see this as a fundamental goal in digital preservation (8, 9). The artist interview is the most obvious way of documenting artist intent. Tools to this end have been developed, for example by SBMK[31] and the Variable Media Network[32]. In this perspective the archivist is approached as offering his or her services to the artist. The artist will normally have the final say in what is to happen with the artwork (Ippolito, 2003: 47). In game preservation the production-perspective is also dominant. Armstrong lists 23 materials that need to be stored beside the games themselves, of which only six might contain some information about the way in which the game was received (2009).

This is different for mainstream media production, where the signature of a maker is not as often perceived as being of authorial value. Also, where art often conveys a message implicitly, most mainstream media production, such as television shows and websites, are quite explicit in the information or message that they are trying to get across. Still, to get a better idea of the production context, the technology used, the social, financial and even political factors an interview with people involved in production can create a clear understanding of production practice. A recent project at Sound and Vision in which news anchors of the past were interviewed illustrated this well. Documentation with this perspective can however be incidental and selective, to capture the production practice of important media productions or to illustrate a certain time period. Apart from the interview, collecting production documents can play a role, such as schedules, plannings, sketches, storyboards and other related design documents and making-offs.

- ***Reception and use***

In art preservation this is seen as the largest gap in most documentation-practice. To some people, works of art exist primarily in the experience of its viewers and therefore they see the lack of information on how works of art are received and how people interacted with it as a vacuum.[33] The poststructuralist notion that the author's intent only presents one, though possibly privileged, perspective on the interpretation of a work is not new. The preservation strategies of ephemeral artworks still often take this perspective though to decide on what to preserve and how to do it. De Jong (2005) suggests that from a cultural-historical perspective the integrity of media products should be retained and that this purpose is best served by storing them in the form in which the audience received them. Documentation performed from this perspective could exist out of screencasts, in which again different strategies can be used: a direct screen capture, an 'over-the-shoulder' video recording of a user engaging the production, with or without voice-over commentary, a single or multiple users engaging the production, or a combination of all the above. [34]

Some of the downsides of documentation have already been mentioned: the danger of it being confused with the production itself and the fact that documentation is most prone to being subjective. Other challenges are:

- Documentation of online productions can be very time consuming. It was reported at the recent Collecting and Presenting Born Digital Art conference that the documentation of an

[31] *Concept Scenario Artists' Interviews*, Netherlands Institute for Cultural Heritage/Foundation for the Conservation of Modern Art, Amsterdam 1999. See also http://www.sbmk.nl/pubs/detail/id/11 (10/1/2013)
[32] http://variablemediaquestionnaire.net/
[33] http://www.fondation-langlois.org/html/e/page.php?NumPage=2121
[34] Constant Dullaart and Robert Sakrowski of net.artdatabase.org have implemented a strategy in which they combine an 'over-the-shoulder' video recording as well as a direct screencast.

online work can take up to three weeks, as opposed to two hours for a painting. This of course depends on the extent to which you document a work, but the argument stands: it might not be possible to properly document every production that is being collected.

- Probably stating the obvious, but documentation itself also needs to be preserved. Attention must be paid to the file formats chosen for video captures, screen casts and text files. Obviously, these are 'normal' linear files and therefore the best practices of digital archiving apply.
- Documentation ideally must be performed in such a way that even if (part of) the actual production (if preserved) gets lost for whatever reason, which at present is not unlikely to occur, the documentation still provides us with enough information to reiterate the work. (See also: Depocas, 2001).
- As we have seen in chapter three, one of the strengths of artistic interactives is that they allow for a more subjective reading because oftentimes a user can choose his or her own perspective. This element will always be difficult to capture in documentation.

To conclude: documentation can be expected to play a more important role in the digital age then before. Whatever other preservation methods are being used, documentation will always be necessary to give an idea especially of the networked nature of the productions. As we have seen, none of the other methods solves that issue.

Conclusions

There is no ideal solution for the preservation of any material, let alone digital, interactive material. There are financial and technological constraints in which one must work. Each of the methods here described have their own strengths and weaknesses. It is therefore impossible to a-priori determine a preservation solution that will suffice in any circumstance for any production. What we can say is that documentation will definitely play a bigger role than it has so far.

The challenge is always to think through the entire archiving procedure, from early acquisition all the way to a possible end-user experience several decades from now. The choices that are made at the beginning of the process will have an enormous impact on the way in which assets can be accessed in the future.

6. Legal and financial considerations

Introduction

As already has been argued, not one of the preservation strategies described above is ideal. Even in the most ideal circumstances, with a combination of all preservation strategies, we still must accept that something will always be lost in the process. However, there are two factors that have so far hardly been discussed, and that have a profound delimiting impact on the quality of preservation: one is finances and the other legal issues, such as copyright. These issues are not new to interactive content. The same can be said of the collections that are presently held and the more traditional media content that is still being archived. In this short chapter I will give an overview of the issues, and suggest where more research needs to take place.

Financial

It seems that in the research that is being done and the pilots that are being evaluated the financial side of things is somewhat neglected. This might be due to the nature of the research that is being performed. Research from a Research and Development perspective tends to focus on the technological solutions that can be developed, without immediately considering the costs of large scale implementation of such solutions. Research performed in the humanities focuses on the historical value and the importance of preservation. In the arts finally, large-scale preservation is rarely the focus, since conservationists are used to coming up with custom solutions for individual artworks.

We must acknowledge however that the costs will eventually be of most influence on the amount of artefacts that can be preserved as well as the quality or depth of the archiving. David Rosenthal, at Stanford University, makes a similar claim: "The major cause of digital objects not being available to future readers is economic; no one could afford to preserve them. The more spent per-object, the fewer objects can be preserved."[35] Jeff Rothenberg, who has worked with the Dutch Royal Library (KB) on several occasions, also suggests that what is still needed are comparative cost analyses, informed by technological understanding and looking at every aspect of preservation: from acquisition to accessibility. In a presentation at Future Perfect 2012, Rothenberg presented a chart in which an overview is given of the costs that need to be considered at different levels, as well as for different preservation strategies, and a classification (high, medium, low) of these costs. These are of course very broad categories and it will prove quite a challenge to predict actual costs in the long term. He did conclude though, that although emulation might seem an expensive preservation method for individual works, in large scale implementation the costs are considerably less than in for example technological hardware preservation and migration.

Cultural heritage institutions in times of economic crisis face drastic cuts. They must find new ways of monetizing on their assets. Karel Dibbets sees this commercialization as a negative trend that threatens the preservation of cultural heritage materials and he does not expect that it will change any time soon. However, when we consider the total turn-over of Sound and Vision over the year 2010, about 45 million, only a very small percentage of that money comes from commercial activities: 1.6 million from providing a service to producers and broadcasters and 2.5 million from the museum. In short we can say that the reuse of archival assets is, at least for now, not to be expected to be a source of great revenue.

Legal

Legal issues also have a dramatic impact on preservation, from the moment of ingression up till redistribution and access. The complexity of legislation leads to extreme caution on behalf of heritage institutions. A lot of the laws around copyright and cultural heritage institutions have never been tested in court and therefore it is unclear what the precise implications will be.

Publicly funded national heritage institutions are entrusted with the task (or sometimes a mandate) of preserving national cultural heritage in a specific field. However, these mandates are often rather unspecific. In the case of Sound and Vision there is a broad task formulated by the

[35] http://blog.dshr.org/2013/02/rothenberg-still-wrong.html, 14/2/2013

organization itself and approved by the minister of Education, Culture and Science.[36] One of the statements included in this this task description says: "Sound and Vision ensures that the collection does justice to Dutch history by collection past, present *and future* of the audio-visual and music culture (my italics)."[37] Even though one could argue that in this statement the safeguarding of online productions is clearly implied, there is no further specification that addresses this issue. In other words, there is no legal obligation or any control on Sound and Vision to engage with this new field. As a result there is little clarity about what its role is in the preservation of online objects. On the other hand Sound and Vision could take the liberty to develop its own vision on these matters.

On the level of the actual archiving other legal issues surface. Migration, for example, basically means creating a copy. This is also the case for digitized linear AV content, but it becomes more urgent for the type of inherently digital or born digital material here discussed because there is no 'original' to go back to and the lifespan of digital files is relatively short. Since 2004. copyright law includes a paragraph that applies to making preservation copies. These can be made but with only three purposes: restoration, preservation if the object is in decay and to keep a work accessible in case of hardware obsolescence.[38] However, in some cases copyright laws might prevent migration from happening (see Armstrong et al: 5), for example if (one of the) rights holders objects to changes made to a production (which with migration is always in some sense the case) the archive must prove that these changes are 'reasonable'[39], a term that can only be interpreted by legal experts or ultimately be tested in court.

In emulation too there are issues with copyrights, but in this case it is not with the productions themselves but with the software environment in which they run. Copyright legislation and the implications for emulation are very complex, and beyond the scope of what is here being discussed. The basic problem is that although using emulation software is not illegal, the ROM-files (basically dumps of the original disks) needed to emulate the actual operating system in most cases are subject to copyright. This is one of the challenges the Emulation Framework, mentioned earlier faces. So far they have managed to secure the rights to six platforms, but larger companies refuse to make their old operating systems available.

The implications of copyright legislation are most visible at the level of access. A lot has been written about this; for example in the 2012 publication by Virtueel Platform 'Schermen met Auteursrecht'. Most of what has been written about it applies to interactives as well. On the premises of cultural heritage situation materials can be viewed without further restrictions. Usage of fragments on institutional website or external website is subject to all kinds of rules and regulations. The bizarre situation in which present copyright legislation leads us is that material that was previously freely available on the web will be very hard to access once it has become an archived asset. The multifaceted nature of interactives might be a further challenge to archives though. A webpage for example is basically a combination or collection of parts; each of these parts might be owned by different copyrights holders. This is true for different parts within a single domain, but also for links with other websites, which depending on the depth of a crawl, might be acquired along with the intended object. In short we can confirm the conclusion of the Board of Culture (Raad voor Cultuur), what has been concluded numerous times that "copyright is the most urgent blockade for the free flow of public e-culture" (2010:16).

Conclusions

This chapter shows that the archiving of interactive content is not just a matter of getting the right software solution in place. The implications of legal and financial issues are far-reaching and affect every element of preservation. The legal field is incredibly complex and also in constant development. Very little is known about the financial implications of the preservation of interactive content. Both will have to play a considerable role in future research. For this reason an interdisciplinary approach, in which experts from both fields join efforts, deserves recommendation.

[36] A letter with the ministers reply can be found here: http://www.rijksoverheid.nl/documenten-en-publicaties/brieven/2010/11/03/reactie-minister-van-ocw-op-beleidsplan-2011-2015-van-het-nederlands-instituut-voor-beeld-en-geluid.html 19/2/2013

[37] Translated from the website http://www.beeldengeluid.nl/missie-en-beleid

[38] Dutch copyright law, section of the law 16n

[39] Dutch copyright law, section of the law 25

7. Organizational requirements for working with interactives

*"Workaday life under a fuzzy set charge is life in the fast lane." (*Lerner and Wanat: *504-505)*

"We normally spend our lives responding, if we ever want to change anything, we have to step into uncertainty through the process of play." (Beau Lotto in TED talk)

Introduction

Most cultural heritage institutions are founded and formed around what we have called a crisp set; a relatively coherent group of elements "with a characteristic that unequivocally determines whether any element belongs to the set (Lerner and Wanat: 500)." This is the case for museums that cover a certain discipline like sculpture or painting as well as those that specialize in a certain time-period or particular artist. Up until recently the collection of Sound and Vision also consisted of what in retrospect can be considered a crisp set: productions for radio and television by Dutch public broadcasters. With the previously described diversification in distribution medium, in source of production and the international co-production that we see especially in transmedial projects and interactives, the categories become more obscure. What then is required at the organizational level from cultural heritage institutions that operate in this complex new media landscape?

Complexity in organisations

Before we answer this question I would like to narrow down what is meant by a fuzzy set and what the implications are working in such a field. The *Cynefin* (pronounce: kinevun) framework as introduced by Dave Snowden (2000) will help us to further differentiate within the fuzzy set.

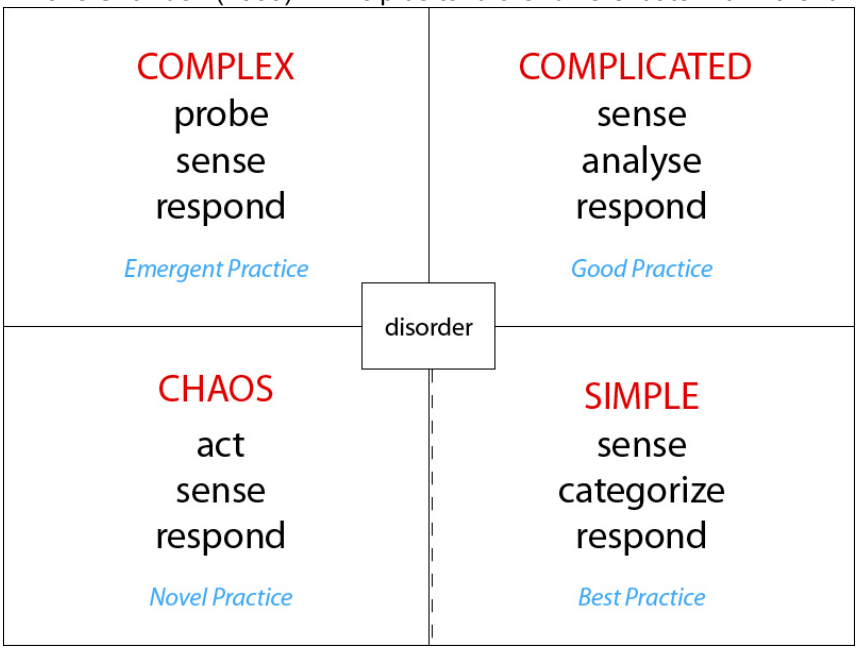

Table 1: The five contexts of the Cynefin framework

Cynefin is a Welsh word "that signifies the multiple factors in our environment and our experience that influence us in ways we can never understand" (Snowden and Boone, 2007). The Cynefin framework then is a sense-making framework that helps organizations and their management better understand the context in which they work and make decisions accordingly, rather than relying on their previous *modus operandi* or on a preferred management style.

As can be seen in the table above, there are five different domains in which organizations can find themselves. The first four - simple, complicated, complex, chaotic - are based on cause-effect relations that exist in the field in which one works. The fifth - disorder - is the space of not knowing in which domain you are. It is in this domain that managers are most likely to lapse into their preferred style. For example if someone has spent several years in a one-size-fits-all, bureaucratic context he or she is likely to try to engage with new issues by adjusting existing rules or protocols.

The 'simple' context can be characterized by clear cause and effect relationships, visible for everyone, predictable and repeatable. Managers in this context will sense - categorize - respond: "they assess the facts of the situation, categorize them, and then base their response on established practice (2007:2)." This has often been the case in archiving audiovisual content: a production can be categorized by distribution medium. The response accordingly would be to assign the production to a certain department, a further categorization based on genre would then lead to an individual documentalist that would add meta-data and create an index in the cataloguing system. The dangers for people working in this context are *entrained thinking*: being blinded to new ways of thinking because of past experience or training, and complacency: when successful in a certain area of work there is a risk of missing new developments. For this last reason it is sometimes said that the border between simple and chaotic is like a cliff: when relying on best practice in a new complicated or complex situation, chaos is likely to occur. Best practice is by definition *past* practice.

In the complicated domain there still are cause and effect relationships but they are not singular or self-evident. Several solutions will have to be considered and in this process experts play a crucial role. In the complicated context people have to sense - *analyse* - respond. Good practice, rather than best practice is guiding because there might be a range of solutions. There are a number of activities of audiovisual archives that could presently be seen as part of this complicated context. For example the selection of material for acquisition based on the collection policy of Sound and Vision in which four value categories have been formulated. In this collection policy (concept version 2011) terminology like 'irreplaceable' and 'symbolic value' is being used, which still needs to be translated in actual collection decisions by experts. Also, creating tools for improving the accessibility of the assets held in the archives can be seen as part of the complicated context.

Complexity then, refers to the context in which singular cause and effect relationships do not exist, or at the very best, are only visible in hindsight. Complex systems are things like the Brazilian rainforest, where everything is in a constant flux and outcomes are unpredictable, because they are the result of sometimes minute changes. One could refer to these complex contexts as ecologies. The appropriate response to these ecologies would be to probe - sense - respond. To probe means to perform experiments that are safe to fail (2007:5) and then to monitor for emergent practices. Based on what we have seen in the previous chapters I think it is safe to say that in the field of interactive AV content we find ourselves firmly in a complex context. A fragmented field of financing, production and distribution; rapid technological developments; changing relationships between producers and consumers and productions that are themselves dynamic and depending on a manifold of factors. In what follows I will therefore combine the suggestions made by Snowden and Boone for working in a complex context, and Lerner and Wanat's advice for working with fuzzy sets and try to generate suggestions for archives for audio-visual material that are wanting to engage this complex field.

New workflows and skills

New media content in general, the fuzzy set that has here been described, requires new workflows and a different skill-set from the people involved in those workflows. The documentalist, in a somewhat stereotypical sense, is a conscientious and focused collector of data to provide an archival collection with the information needed to retrieve and possibly contextualize a production. The work is mainly performed by following fixed procedures and stable categories that are developed based on collection policies and mandates. Because of personal interest, academic background or experience, documentalists often develop expertise in a certain genre or medium. To understand and document the nature of new media productions new qualities are required that are not commonly expected from documentalists that are trained in linear and stable media archiving.

This can already be seen when looking at Sound and Vision's recently started collection of Internet Video, where active acquisition is required and a selection procedure must be performed by the documentalist him or herself for each individual video. The current position of the documentalist where it comes to acquisition can be characterized as fairly passive. Through the DDV-system[40], all radio and television content flows into the archives, there is no need therefore to actively acquire material. The standard distribution channels, which allowed for automated and largely passive acquisition, increasingly belong to the past in a post-broadcasting media landscape. Instead documentalists in the new-media department will in some sense become curators with a well-developed sense of cultural and artistic value and a pro-active mentality. Where different expressions of a single production are dispersed over a number of media technologies, the documentalist needs to

[40] "De Digitale Voorziening", a digital infrastructure between public broadcasters, Sound and Vision and Technicolor the organisation responsible for the technical execution of broadcasting.

be able to preserve those expressions as well or alternatively, find people or institutions who they can cooperate with in order to reassure the preservation of the assets.

Documentalists will increasingly take up tasks of curation, or more specifically digital curation, which is also the term used by Douglas Harvey (2010). The reason for this is that the amount of digital, interactive material that is being produced is daunting at present, and expected to increase drastically over the years to come. Audiovisual cultural heritage in the digital age is not limited to professional production by the public broadcasters as we have seen in chapter two. Commercial and amateur content are expected to become more prevalent due to the limitations that public broadcasters are presented with and because of the accessibility of production technology. The increase in objects that can potentially be archived, combined with financial means that are at best stable, at worst declining, this means that selection becomes an even more critical step. Curation is a buzz word in the new media scene and is being used for basically anything that includes some form of selection. Traditionally the role of a curator is to expand a museum's collection by buying new works, to ensure the authenticity of the works collected and to put together exhibitions. The decision of which work to buy is partly based on knowledge of the financial and artistic value of the work, but also largely on personal taste. A curator will usually try to collect and present items in such a way that a story is being told that enriches the experience of the viewer. A digital curator will be involved in the selection and acquisition of digital material, using his or her taste and knowledge to judge the artistic and cultural value of a production and having the responsibility to guard the authenticity of the production throughout the preservation process.

As seen in the chapters four and five the methods of migration, emulation and virtualization, where the original functionality of the object is maintained, are (at least for now) not always feasible, rarely affordable and only occasionally justifiable. The interactive object itself might therefore not be a part of the archiving process. Instead, text, pictures and moving images will create the documenting information necessary to envisage the production as well as its context at a future time. The documenting skills of the documentalist will be needed beyond the mere attribution of textual meta-data. Creativity is needed to choose from the documentation option available to us.

Because the amount of objects that is being documented at Sound and Vision is unique compared to the collection of for example museums (fifty per cent of all television content produced or distributed by the public broadcasters is documented 'in depth'!), procedures need to be standardized and short. For this reason an attempt has been made to conceptualize a workflow appropriate for interactive audio-visual productions (in appendix 1). The flexibility of productions programmed using code is such that there is no way to predict all possible outcomes and properties that such productions will display. A considerable degree of flexibility and independence is therefore required from documentalists.

This flexibility is not just needed from documentalists, but also from the systems they work with. Cataloguing systems are complex and expensive to build and implement. The rate at which these systems are updated is far slower than the development of new types of content that need to be preserved. Ideally, new systems would be developed in close collaboration with other big archives which reduces costs and allow for a greater degree of standardization and knowledge exchange. Also, the cataloguing system here envisaged should be modular, highly adaptable to new types of content and it should support a great variety of front-end interfaces that could serve different user groups.

Conclusions

In this chapter we have argued that in the field of new media preservation in general, and in the preservation of interactives in specific, we find ourselves in a complex context. This in contrast to the simple context in which most audio-visual archives work at present. It is important to acknowledge this and adjust the response accordingly. It is therefore to be expected that pilots and projects, as a way to probe, will be the rule rather than the exception.

People working in this projects will have to develop a skill-set that is quite different from the skill-set of present day documentalists. Selection, curation and active acquisition are some of the activities that they will have to perform. They also have to develop good IT skills and be able to employ a variety of documentation actions.

In the early stages of an institutions engagement with online, interactive content there could be a need for a specialized curator of e-culture.[41] This curator could hopefully bridge the gap between the dynamic environment, bureaucratic momentum and inexperienced staff (see also Mintzberg, 1978). Much of the adaptation of organizations to fuzziness lies in the reliance on precedent (Lerner and Wanat, 502). In the long term however, when e-culture becomes ever more ubiquitous,

[41] This need was also expressed by participants in the research done by Van der Graaf (2010).

swallowing up traditional media, at least some of the skills here described are required from documentalists in all domains.

Conclusions

Introduction

What will have become clear by now is that the preservation of interactives touches on a wide variety of issues. These issues they share with many of the other expressions of the new media landscape. The requirements that interactives impose on cultural heritage institutions and archives are equally varied, and cover the whole of the preservation process: acquisition, selection, analyses, preservation and access are all elements that will look different when engaging with these new, interactive forms of cultural heritage.

In this research report we have first looked at the nature of interactives as cultural artefacts; what are their distinctive properties, what are the institutions involved in their production and what analytical tools help us to understand these productions. In the second part of this report we looked at the question of the preservation of these interactives; what are the designated communities and their needs, which archiving methods are available, what are some of the legal and financial considerations and what are the organizational requirements for archives working with interactives.

The nature of interactives

Through convergence we are facing what we have called a fuzzy set, which is difficult to subject to a further categorization, as is common practice in current archiving practice. Rather than letting this problem obstruct a pro-active engagement with interactives, archives should try to be more pragmatic and focus on the properties of interactives as archival assets. The interactives are, in different combinations and in varying degrees: interactive, transmedial, networked, participatory, hyperlinked, immersive and hardware dependent. These properties can serve as a guideline for the selection of a preservation method(s).

Mentioned convergence is also visible at the level of the institutions that are involved with the production of interactive audio-visual content. Finances can come from a variety of funds and bussiness models, both public and commercial, related to the arts and to mainstream media-production. At present though public funding is most common for high quality interactive productions. The producers of interactives also come from a variety of backgrounds: advertising, documentary, television production, paper publishers, etc. They also combine a great number of disciplines; programming, filming, animation, writing. For an archive to gain access to this varied field they need to build an extensive network of collaborators.

Because of the dynamic nature of interactives they need to be understood as cybernetic circuits that function in and through feedback loops between men and machine. For documentalists working with interactive content this means a stronger focus on capturing or describing the functionality of the production and on the way in which producers and users interact by means of the production.

The preservation of interactives

The designated communities that can be imagined for interactive content are largely the same as those for linear content. Historians, media-archaeologists, but also social scientists, are potential users for the interactive audio-visual productions that are held in the archive. They have different requirements in terms of the number of assets they need to answer their respective research questions, but also in terms of the way in which the interactives are stored and made accessible. Producers seem most concerned with the reuse of linear elements only, at present they do not anticipate the reuse of the interactive interface itself. For them it is a case of having easy access to these linear elements in the best quality possible. For a general public the interactive without the interactive functionality is hardly interesting at all. In their interactive constellation they could possibly be re-distributed online or they could be adapted for display in an exhibition. They would be expected to generally appreciate popular productions more than those in the margins. In short, the requirements that the different designated communities have for the way in which interactives are archived is varied. It is therefore to be expected that a combination of preservation methods will serve best their needs.

We have discussed a number of methods to preserve interactives: technological hardware preservation, migration, emulation and documentation. All of these have their advantages and disadvantages. Emulation still has a long way to go before it can be implemented at the scale that would be needed for larger audio-visual archives, but it does seem to be the more viable option for the

preservation of the interactivity itself. Documentation will become more important where the interactive elements and networked functions cannot be archived.

The way in which interactive content can be preserved is largely dependent on the financial means that are available. Very little is known about the exact costs for the acquisition, ingest and continuous preservation of an interactive production. Also, legal issues affect the way in which preservation can take place. Here too clarity is needed.

Finally, the organizational requirements for an archive engaging with new media content and specifically interactives were discussed in the final chapter. Documentalists will spend more time curating and will have to develop skills to work with complex productions and a variety of preservation methods. It is very important in this stage to 'play', to create precedents by performing preservation pilots. Bureaucracies dealing with fuzzy sets rely on these precedents to a great extent.

Suggestions for future research

The focus in this research project has been on the 'how' of the preservation question. The 'why' of the preservation question was answered to a great extent by refering to the UNESCO statement and the simple fact that interactive content is essentially missing from Dutch archives. It is still a question that could be adressed more in-depth though, by focusing on the social and cultural significance of interactive productions. These questions can be answered by studying the reception and use of interactives and the role they play in society.

Because of the focus on the preservation itself, the properties that have been coined in this report have mainly been chosen because of how they affect the preservation process itself. They have therefore been interpreted in mainly a technological and pragmatic sense. The social and psychological dimensions of for example convergence and participation have been largely neglected, whereas a thorough understanding of these is necessary to understand how these artefacts relate to society at large.

More specifically though, research into the preservation of interactives will have to take shape through hands-on preservation pilots. The different preservation methods here described can be combined and evaluated. This rings true with the advice of the Board of Culture (Raad van Cultuur) in a 2010 report. They suggest that e-culture research should not be seen as equal to classical academic research, with disciplinary boundaries and methods and publications as end-results. It is more about a mentality that is focused on answering relevant and urgent questions by intervention and experiment. The search is not so much for new theory, but for new forms and new practices (12).

The preservation pilots should be end-to-end pilots that cover the whole of the preservation process from acquisition and archiving down to disclosure and presentation. The results should not just be presented in terms of the quality of the preservation-method, but also in terms of the financial and legal attainability of that particular method. The pilots should be run in close collaboration with other archives to make sure that the knowledge present in each of these institutions becomes available to others. This would include museums and archives for the arts with their experience in the customized preservation of individual works of art.

In these pilots, attempts should be made to involve audiences from a variety of backgrounds. As Nick Poole, CEO of Collections Trust, argues: in an age of participatory culture the user of the archive is not just an end user at the end of the process, but he or she is "intimately written into every part of it - from selection, to assessment, to prioritisation, to digital surrogacy, to interpretation, distribution and use."[42]

The challenges that interactives pose to archives and cultural heritage institutions are manifold and in a stage where linear broadcasting still plays such an important role the temptation can be to stick to business as usual. The interactives however also offer a chance to engage with the new media landscape and by doing so positioning the institutions for the future. The degree to which new media technology facilitates interactivity is unprecedented and as such it represents an important shift in the producer-user relationship. Interactives tell an important story about our society and they deserve our best efforts to be safeguarded for future generations.

[42] http://www.collectionslink.org.uk/discover/new-perspectives/1402-the-participatory-museum

Literature

Armstrong, Andrew et al. “Before It's Too Late: A Digital Game Preservation White Paper”, Game Preservation Special Interest Group. Retrieved from http://wiki.igda.org/. 2009

Ascott, Roy. “Behaviourist Art and the Cybernetic Vision.” In: Randall Packer and Ken Jordan (ed): *Multimedia. From Wagner to Virtual Reality New York*, London: W. W. Norton & Company 2002, pp. 104-120

Ashby, Ross. *An Introduction to Cybernetics*. London: Chapman and Hall, 1957.

Baker, Drew and David Anderson “Laying a trail of breadcrumbs - preparing the path for preservation.” In *POCOS* (Preservation of Complex Objects) deliverable Vol. 1: *Visualisations and Simulations.* 2009. 15-23.

Barthes, Roland. *Camera Lucida* New York: Hill and Wang, 1981.

Dibbets, Karel. “Op zoek naar een digitale conservator” in *Audio Visueel; van emancipatie tot professionalisering*. red. Mieke Lauwers, Bert Hogenkamp. Stichting Archiefpublicaties. Den Haag: 2005.

Ernst, Wolfgang. *Digital Memory and the Archive.* London: University of Minnesota Press, 2013.

Graaf, Maurits van de. *Born-digital erfgoedmaterialen bij een selectie van Nederlandse erfgoedinstellingen*. Pleiade Management en Consultancy, 2010.

Hansen, Mark. *New Philosophy for New Media*. London: MIT Press, 2006

Harvey, Douglas. *Digital Curation: A How to Do it Manual.* American Library Association. Chicago: 2010.

Hayles, Katherine. “How we became post-human: Ten years on an interview with N. Katherine Hayles.” in *Paragraph* 33.3. 2010. 318-330.

Hediger, Vinzenz. “History, Archaeology, Aesthetics, Archive: Theoretical Paths” In *Preserving and Exhibiting Media Art: Challenges and Perspectives* Ed. Noordegraaf et al. Amsterdam: Amsterdam University Press, 2013

Henriksen, Sofie Laier, Wiel Seuskens, Gaby Wijers. Deliverable of DCA (Digitizing Contemporary Art) D6.1 *Guidelines for a Long-term Preservation Strategy for Digital Reproductions and Metadata.*2012-2013.

Ippolito, Jon. “Accommodating the Unpredictable: The Variable Media Questionnaire” In *The Variable Media Approach: Permanence through change*. 2003.

Jensen, Jens. “‘Interactivity’: Tracking a New Concept in Media and Communication Studies” in U. Carlsson (ed): *Nordicom Review*, 12, (1) 2008.

De Jong, Annemieke. “Het audiovisuele domein als kringloopwinkel: nieuwe culturele logica maakt van digitaal erfgoed een *moving target*.” in *Audio Visueel; van emancipatie tot professionalisering*. red. Mieke Lauwers, Bert Hogenkamp. Stichting Archiefpublicaties. Den Haag: 2005. 77-93.

Laurenson, P. "Authenticity, Change, and Loss in the Conservation of Time-Based Media Installations" in *Tate Papers* (2006)

Lerner, Allen W. and John Wanat. (1983). Fuziness and Bureaucracy. *Public Administration Review, 43* (6). 500-509.

Lessig, Lawrence. *Remix: Making Art and Commerce Thrive in the Hybrid Economy*. London: A&C Black, 2008

Machiori, Dario. "The Analysis of the Artwork" In *Preserving and Exhibiting Media Art: Challenges and Perspectives* Ed. Noordegraaf et al. Amsterdam: Amsterdam University Press, 2013

Mackenzie Owen, John. "Preserving the digital heritage: roles and responsibilities for heritage repositories." in: *Preserving the digital heritage* Red: Yola de Lusenet, Vincent Wintermans. 2007, Netherlands National Commission for UNESCO, Amsterdam.

Malpas, J. "Cultural heritage in the age of new media." *New Heritage. New Media an Cultural Heritage*, Routledge (2008). pp 13-26.

Massumi, Brian. *Semblance and Event: Activist Philosophy and the Occurrent Arts*. London: The MIT Press, 2011.

Metz, Christian. *Film Language A semiotics of the Cinema*. Chicago University of Chicago Press, 1990

Murray, Janet. 'Immersion.' *Hamlet on the Holodeck*. Cambridge: The MIT press, 1997.

Raessens, Joost. 'Computergames as Participatory Media Culture' Hfdst. 24 in: Raessens, J. en Goldstein, J. (red.), *Handbook of Computer Game Studies*, Massachusetts, 2005, pp. 373 – 388.

Rafaeli, Sheizaf. "Interactivity: From new media to communication." In R. P. Hawkins, J. M. Wiemann, & S. Pingree (Eds.), *Sage Annual Review of Communication Research: Advancing Communication Science: Merging Mass and Interpersonal Processes*, (1988) 16,. Beverly Hills: Sage. 110-134

Rinehart, Richard. *A System of Formal Notation for Scoring Works of Digital and Variable Media Art*. Text presented at Refresh! The First International Conference on the Histories of Art, Science and Technology. 2005.

Odin, Roger. *Les Espaces de Communication: Introduction á la sémiopragmatique*. Grenoble: Presses Universitaires de Grenoble, 2011.

Snowden, David. "Cynefin, A Sense of Time and Place: an Ecological Approach to Sense Making and Learning in *Formal and Informal Communities" conference proceedings of KMAC at the University of Aston*. July 2000

Snowden, David and Mary Boone "A Leader's Framework for Decision Making" in *Harvard Business Review.* November 2007