Creating Strong Cross Media Concepts for Museum Exhibitions

Sebastian Hall

Department of informatics
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Abstract

In this paper I argue that, in an effort to create novel cross media exhibition concepts, museums should use service design. By realigning their organizations and embrace the fact that what they are offering is indeed a service, they can gain a new outlook and generate new ideas about how to create novel cross media exhibition concepts. I also suggest that treating the exhibition in a similar way that film studios treat franchises could help shift the mindset and make it cross media-centric. In order to arrive at these conclusions I performed an observational study and conducted qualitative interviews with museum professionals working in various museums in Sweden. The observational study was designed to get a grasp of the current state of digital artefacts in Swedish museums whereas the interviews were aimed towards identifying attitudes as well as knowledge of current opportunities and obstacles. The observational study taught me that instances of rich, meaningful interactions with ties to an overall concept was not common, and that there is definitely opportunities to think differently about delivering these types of distributed user experiences. The interviews gave me a greater understanding of the intricacies of the field of cultural preservation and museums, as well as insight into some of the reasons why things are the way they currently are. Using service design to align these organizations could perhaps aid with some of these reasons.

Keywords: Museums, Exhibition design, Cross Media Interaction Design, Service design

1. Background

In modern times, museums have evolved from being private collections created and maintained by scientists, to becoming curated by professionals, and opened up for the public to visit. The academic field of museology primarily deals with questions around the objects themselves and their texts and how they can educate us, and conserve our cultural heritage. The text typically contains information and data about the object. Where does the object come from, and how was it used are questions that the text answers. This is the context of the object. In many ways, the goal of museums has evolved from primarily conserving our cultural history and their collections of objects, to using the collections held, to educate society at large. As museums increasingly have opened up to the public the need for guidance and design of exhibitions has increased (Smeds 2007). Museums have also entered the experience economy (Mossberg, 2003), competing with many others, sometimes commercial organizations for visitors and tourism.
One way of dealing with the demand of increased guidance in the exhibition hall has been to augment them with digital artefacts - not only in ways that provide extra information, but also allowing completely new experiences that were not possible without interactive elements (Oppermann & Specht 1999). In my preliminary observational study I learned that the most common digital artefact in museums is the information kiosk. Unfortunately, the information kiosk, even in its simplicity, can often overwhelm the visitor with too much text and sometimes hinders the visitor from focusing on the exhibition by creating a distance between the visitor and the exhibition (Kelly, 2000). Richer interactivity that allows for creativity and creation of personal content has been shown to give more meaningful and engaging experiences, opposed to the rather flat, and predefined, interactions of information kiosks (Hornecker & Stifter 2006). Hornecker and Stifter also present results that show that allowing visitors to take part of a performance (that is placed in a setting where the other visitors get to see it) can also give a great experience with high levels of engagement. They also make the point that only browsing the stations is a common visitor behavior. This means that the visitors are inherently hesitant to engage with interactive content. In order to combat this fact Hornecker & Stifter suggests that a low threshold for initial interactivity is required.

As a rule of thumb the user needs to be rewarded within the first ten seconds of the interaction. With this small victory, of a successful interaction, the user is encouraged and can be rewarded further by being engaged with challenges of a higher difficulty and a higher degree of complexity (Hornecker & Stifter 2006).

Another aspect of the museum experience is that museum going is often a social activity done in groups (Lehn 2001). This is something basic that designers need to take this into consideration during the design of novel cross media concepts. Virtual museums with a mixture of digital and physical touchpoints and a clear cross media approach have also been shown to be effective in building interactive communities and unique places around cultural and natural heritage (Giaccardi & Palen, 2008). In another example hybrid interfaces has been created to create innovative experiences in Nottingham Castle (Bannon, Benford, Bowers & Heath, 2005).

It is not surprising that these types of user experiences are being designed and delivered in a museum setting. The exhibition, as a form of communication, is highly interesting from a cross media perspective due to the fact that exhibitions, even before digital artefacts, use a wide mix of media such as physical objects, text, moving images, sound, sculptures to weave narratives, tell stories and convey experiences.

1.1 Why is this interesting to study?

This multi media property of exhibitions was one of the aspects of museums that initially drew me to study something related to the field.

The mind boggles at what kinds of experiences that can be designed if museums are able to create concepts that can make use of the internet, mobile devices, sensor based installations and all other things that the digital advances has brought us. Looking internationally there are plenty of examples of novel concepts created that have been very interesting (see appendix for a list of great examples). But there is not only with regards of
creating user experiences that this is important. There is also a political agenda pushing the industry to digitize their collections and explore how to make them available in a more accessible way (Regeringen, 2013).

While museums are cultural institutions and should not have to do the same things as other tourist attractions, they are competing against other attractions. I think the ultimate fear is that if museums fail to capture the imagination of society, and lose their appeal among the public, it will only become easier for politicians, and society, to prioritize other things before cultural preservation. This could ultimately harm our cultural heritage. That is why it is important to create a scene where going to the museum is considered fun and is popular across all cycles of life.

It is my belief, that museums have a unique opportunity to deliver powerful experiences that not only can inspire, teach and amaze but also act as a service, interacting with society and guiding citizens through the world of knowledge that the museum is an expert in. I am trying to look beyond the interactivity of kiosks, and standalone interactive stations (even good installations), and instead look towards a multi touch-point, cross media perspective that can encompass the whole museum, on- and offline. The process of aligning an organization that was described to me as a “steamboat”, referring to the time it takes to turn, to handling themselves with confidence in the digital domain is not easy. I do think that the field could surely do well by experimenting with new ways of working. I have the utmost respect for the museum world and by no means do I believe that I am “solving” an unsolved mystery. There are already many museums doing fantastic work in the cross media-domain, I am only trying to highlight some factors that I believe are important and that I hope someone can find useful in further studies of this area or as a provider of insight or inspiration in designing for this domain. With this as my background I am asking the following research question:

What is the current state of interactive systems in our Swedish museums and how does one look beyond the individual artefact and design better cross media concepts for museums?

2. Related research

Because i come to the world of museums from a background of interaction design and cross media interaction design in particular I have decided to rely upon research done in these fields rather than that of the museum world. Let me begin by giving a brief overview of the area that is cross media interaction design.

2.1 Cross media interaction design

Actually defining cross media interaction design is problematic. This is mainly due to the fact that cross media is a collection of individual areas that are dealing with these concepts. This is much in the same way that interaction design actually is a combination of influences from industrial design, communication design, human factors and HCI (Saffer, 2010). Cross media interaction design is currently being used in the following areas of practice or research:
Ubiquitous computing, embedded devices, wearable computing, IoT. (Oulasvirta, 2008)


Gaming / pervasive games (Benford et al, 2005)

Cloud based systems that rely on cross media synchronization and the data allowing distributed computing (Dearman and Pierce, 2008)

Advertising and branding where a wide variety of media is utilized to influence opinion and behaviour of consumers (Voorveld, Neijens, Smit, 2011)

Cross media publishing where content is distributed across delivery networks of great variation (Bechmann Petersen et al, 2005)

Service design, where service avatars are used to facilitate service offerings

Out of all the fields above, the one that cross media is even closer to, is interaction design. This is the area that cross media interaction design owes its methodologies to. Interaction designers commonly solve problems by using methods like working with personas, iteration cycles involving prototyping, as well as usability testing and other evaluation methods (Saffer 2010). These methods are currently being used in cross media interaction design. Like interaction design the decisions and choices are based more or less on insights generated from the employment of these methods as well. This makes it user centered. The question is if these methodologies are enough to support the needs of the increasing complexities of cross media or if cross media-specific methods are needed.

Some researchers have tried to evolve these methods by developing frameworks and terminology for cross media services. Central elements of cross-platform user experience has been identified as, “fit for cross-contextual activities, “flow of interactions and content”, and “percieved service coherence” (Wäljas, Segerståhl, Väänänen-Vainio-Mattila and Oinas-Kukkonen, 2010), and in an attempt to create a language and framework around which one can understand, describe, analyze and design these systems. Some of these mentioned characteristics certainly apply to the world of museums. The advent of smart phones and the ubiquity of web and social media usage certainly renders some aspects of the museum experience “fit for cross-contextual activities” and affording traversal between different modalities and devices.

Dena (2004) presents a good tool to understand storytelling in multiple media. Her model consists of axises X Y and Z, representing the multi-channel definition (story world channel composition), mutable work stages (publication schedule) and participatory continuum (level of participation in what is commonly called earned media).

Wäljas et al. argues that a “certain degree of functional modularity should be maintained”, meaning that cross media service designers should deliver functional systems that can work with or without digital devices. By the same philosophy museums would do well by delivering tiered digital content (Dena 2008) which is a concept that tailors the content depending on skill and willingness to use cross media functionality of the user. In effect the different audiences get different content.
A simple example illustrating this concept would be a Twitter hashtag printed on an object in the physical environment. The means to find and engage in the conversation on Twitter would only be discernible for a visitor that understands how the Twitter hashtag system works, what it is, and is already using Twitter. This is fine for the museum world in the way that they are already accustomed to designing exhibitions tailored for various levels of previous knowledge of the exhibitions subject matter. In providing beginners and experts with compelling content depending on their knowledge, they could apply the same logic to technology. If the digital content can be tiered in the same way, much has been won in the attempt to create a coherent experience.

Experience cohesion is the ultimate goal of cross media experiences and services (Segerståhl, 2009). This is not an easy task due to the complexities involved with many platforms, and ever evolving usage patterns. It should come as no surprise, in the case of museums, that this is not done perfectly in all cases. Unfamiliarity with the design of cross media, due to the fact that it is not their main activity, can leave museums struggling.

2.1.2 The Call to Action cycle
One other area (along with the Framework of Wäljas et al.) that is applicable to exhibition design, with a view on cross media is the CTA-cycle presented by Christy Dena (Davidsson, 2010). This way of thinking about cross media-specific interactions state that interactive objects in cross media productions should have a well designed primer, a referral and a reward.

- **The primer:** Prepares the interaction, and motivates the user to act
- **The referral:** Provides the means and instructions with which to act
- **The reward:** Acknowledge the interaction and compensates the user

These three properties are all designable and are applicable to exhibition design. Going back to the example of the Twitter hashtag that would be an example of a CTA-cycle that is incomplete. There is no primer that prepares the interaction and motivates the user. If a prompt would be printed next to the hashtag reading something like “Discuss this object with other visitors on Twitter” that would be the primer. The hashtag would be the referral which provides the means to act upon this particular loophole, and the reward would be taking part in the conversation around the object. This is a basic example to illustrate the point. It is important to remember that the reward is the most important part of the CTA-cycle because it facilitates ongoing participation (Davidsson et al, 2010). Failing to reward the user for their interaction leads to decreased engagement and can lead to user “burnout”. If the user gets conditioned into believing that the reward is bad they will not be willing to interact much more.

2.2 Services
Services are unlike products in one distinct way. Services cannot be materially possessed, they can instead be experienced, created or participated in (Shostack 1982). So how does one go about to improve service offerings over time? Are there any specific methods that can improve services with a holistic view that is holistic in terms of service touchpoints,
encompassing everything from the ticketing system, the different customer service, websites, a tweet, the physical room and everything else that can combine to create the museum experience? Service design is a way to think about services through the lens of design, and offers methodologies to constantly evolve and improve services.

2.2.1 Service design

“Design is not only crafting details of products anymore. It is a field that designs complex and interactive experiences, processes and systems. It involves expertise and experts from related fields and clients in the design process. It uses special processes, tools and methods” (Moritz 2004. pp 7)

Professionals that are in the service sector are sometimes not conscious that what they are producing is a service. As a consequence they sometimes fail to realize that design of this certain type of intangible goods require special considerations (Moritz, 2005). In short, service design is a set of tools that can be used in order to design better services. It encompasses many of the design methodologies of interaction design, and much like interaction design the process cycle of designing things begins with insights based on user research, divergent thinking and exploring, followed by convergent thinking and reduction of ideas that can ultimately lead to prototyping and development.

The practicing service designer envision, visualize and implement service solutions that do not yet exist. It is a human centered approach that aims to tailor itself to the users of the service. If the service takes into consideration who the human that is using the service is, it has a greater chance of creating an experience that fulfills the service goals in management, operations and marketing (Holmlid, 2007).

I believe service design to be especially useful in the area of cross media interaction design due to the fact that it is media agnostic. In designing customer journey or service blueprints (common service design tools) one can get the zoomed out perspective that is required, and tailor service touchpoints around the behaviors of the customer. All while fulfilling organizational goals and making the most of the resources at hand.

2.2.2 Service design tools

Service blueprinting is a common service design tool with which you map out all cogs in the machinery that is behind delivering a service. You get to see which resources are available for what, and where there are gaps for the customer. It is a good way to visualize changes in the organization. “What happens if our specialists blog about their area of expertise, how does the blueprint change? How can we free up this resource? Why is that resource back of house, it could be front and center” These are the sorts of questions and lines of reasoning that can be helpful in finding embryos for new ideas and concepts.

I think that this type of exercise could be very good at coming up with new ways of communicating for museums. As museums are producing more content in order to communicate their collections they are edging closer to something called content marketing. Digital content marketing contains a mixture of the properties of product and service (Koiso-Kanttila, 2004) and the museum can themselves produce content that markets the main
production, often an exhibition. This model works the same way as the franchise model in Hollywood for example, where content is spread out around a large tentpole production (Davidsson, 2010), engaging the most loyal fans, as well as providing incentives for newcomer to join in.

3. Methodology

In order to answer my research question I decided to employ a combination of methods with different approaches. An observational study, designed primarily to get an overview of the current state of interactive systems in Swedish museums today was combined with qualitative unstructured interviews (Kvale, 1997).

Had I performed a survey rather than observations I could perhaps have gotten a better overview over the usage of digital artefacts in museums, and it would have given me a larger amount of data to analyze. However, I felt that my own opinions and views on interactive systems was important to the context of the study. I felt that I needed to see as many digital systems in use today as possible. Having quantitative data or more statistics would surely have been nice, but I was looking for deeper, qualitative insights. I was also trying to get a feel for what differences there were across the different categories of museums. For those reasons I simply had to see as much as I could myself. A survey would have suffered from the fact that everyone has a different opinion about what is good and bad, and that opinion probably differs from mine.

The interviews were conducted with producers, designers and purveyors of exhibitions. The combination of observational data and interviews provided me with many things to work with. The observational study resulted in a good overview (even though it is not representative of every museum in Sweden) of the of the current usage of digital artefacts. In addition to an overview, it also gave me a foundation and surface knowledge about the context in which to frame the data that was gathered in the interviews.

The observational study was instrumental in giving me questions and outlining areas to inquire in greater detail in the interviews that followed. Had I not performed the observational study, the depth of the interviews would have suffered. In many ways, all of the questions I used in the interviews were ideas and concepts that was a direct results of the previous observational study.

3.1 Observational study

I felt that I needed to get an overview over the current landscape of digital artefacts in our Swedish museums as early as possible in the writing of this paper. I went to Stockholm and visited several exhibitions across many different museums (for more details about the specific museums and exhibitions I visited, see appendix). The selection of museums to include in my study was the combined result of many factors. Let’s start with location. The reason for going to Stockholm was due to the fact that Stockholm has the highest concentration of large museums in Sweden. No other area in Sweden has the same level of museums, with the same amount of visitors. There was also a wide variety of museums there,
in terms of genre. Everything from natural historic museums to art museums was visited. I felt there was a nice spread of different categories of museums located within a reasonably small geographic area. I mapped out locations and identified routes that would maximize the amount of museums visited in the limited time I had. I looked at their respective opening hours and calculated a travel path that would allow me to visit as many museums as possible. In order to get a random sampling I did not discriminate against museums that I was pretty sure would not have much in terms of digital artefacts in the exhibition halls. I just went to as many places I could.

In order to successfully follow the schedule I had to keep my visits quick. I made sure to document every digital artefact that I found with still photography, as well as taking notes of different types of interaction that was being presented. What was the level of interactivity? How were signifiers that instruct visitors of digital capabilities designed? Were there anything else that stands out that I should remember? I took pictures and notes to remember things like this.

3.1.1 Working with data
I made sure I kept gathering data separately from analysis to increase the efficiency in the data collection. Analysis would come later. After the collection phase was over and I could work with the collected materials I divided pictures and classifications of the different digital artefacts and their respective interaction models. I classified them further into categories depending on their similarity with each other. I was able to group them and identify which interaction models and artefacts were the most common, which were the best and which had utilized the CTA-cycle in good or bad ways. Then I was able to go through the material and arrive at conclusions as to what I had found.

3.2 Interview study
In order to proceed after the observational study I decided to interview professionals within the museum world. The qualitative research interview was my choice for the interviews due to the fact that it is a good way to get in depth data, coming from real knowledge and insights from people that have a lot of experience to draw from. I decided to conduct unstructured interviews in line with the set of guidelines from the research methodology literature of (Hartman, 2004). It is a qualitative interview method, where the user is able to talk freely, but with an interview guide that makes sure that you cover the themes that was intended.

One of the strengths of this type of interview method is that you have the opportunity to enquire in great detail by following up on answers with more questions if something interesting themes are discovered (Robson 2002). My experience from previous interviews has given me the opinion that this method allows for plenty of depth as well as a great deal of freedom to stray from the script during the interview, something that was more a rule than an exception during the actual interviews. I prepared an interview guide that allowed room for discussion and off-shoots to take place, as well as further prompting depending on the answers given from the respondent.

As I mentioned, the interview guide and questions in it was heavily informed and influenced by the observational study. I also discovered that as I performed more interviews
that the off-shoots and straying of the script became more common. This is in line with the qualitative method presented by (Hartman, 2004), where the knowledge you get during the study influences your ability to collect further of data. This way of studying is more interactive than sending out standardized questionnaires for example and it served me well. However confident I was during the interview, I made sure to keep referring back at the interview guide to make sure that the themes of inquiry had been touched upon and discussed.

3.2.1 Mediated interview considerations

In an effort to save time and money I chose to perform all of my interviews over Skype rather than in person. This made the recording process easy and I did not have to consider the geographical location of the respondents. Perhaps it is preferred to actually perform the interviews in person, but in that case I would have been limited to participants in a smaller geographic area and would not have access to the professionals in the large museums that the phone interviews allowed me. E-mail messaging could perhaps have been useful, and would have helped me to get more interviews, but the lower interactivity did not support the chosen lack of structure of the interviews I previously mentioned.

A study comparing instant messaging (IM), mail and phone interviewing in qualitative interview studies concluded that, although no evidence was found suggested that phone interviews actually yielded better data, the researchers still believed that to be the best preferred interview method due to the interactivity (Dimond et al 2012). The only measurable strength of IM was that no transcription was needed, and it is therefore a time efficient interview method. I do not mind transcribing a few interviews, and I prefer conversation over instant messaging. I have no experience with IM interviewing and I made the choice that phone interviews was my preferred option given all combined factors.

3.2.2 The selection process

The selection of respondents was not entirely straightforward as I had a very specific target group. I was after producers of exhibitions working in the museum world, working on concepts, or strategy around cultural preservation.

I started by asking around my personal network and on Twitter, as well as reaching out to people that work with museums and exhibitions in and around Umeå and Skellefteå. I sent out e-mails with calls for the interview to some of the bigger museums in Sweden that had readily available contact information on their websites, and later targeted people individually with phone calls. At the end of every interview. I also asked the respondent if they knew of anyone that fit my criteria that they thought could be interesting for me to pursue. This is commonly called snowball sampling technique (Biernacki & Waldorf, 1981), but unfortunately it did not lead to any new interviews. In the end though, this combined effort netted me six qualified interviews that all fit all the criteria that had for the interviewees.

I was initially of the opinion that the number of interviews bordered on the low side and felt this to be a weakness of my study. It was difficult to get people to participate in the interviews so it was a struggle. It should be added that I make no claims that my selection of respondents is somehow representative of any larger group. As my study progressed however, I realized that my selection of participants felt sufficient for me to answer the
research question. The fact that I was not performing a comparative study, but one focused on experiences and expertise made a smaller number of respondents suitable. That and the fact that a lot of the themes and opinions were recurring throughout the interviews even with such a low number of interviews suggests that the number of interviews were of a sufficient number.

3.2.3 Respondents
I am also very happy with the respondents that I finally did get to interview. In the end I had rich data collected from some really knowledgeable and experienced professionals. The fact that they represented some of the largest and most respected culture-preservation institutions in Sweden did not hurt. My respondents have a combined 60-70 years of experience working in the culture preservation sector.

The respondents of this interview agreed to participate under the agreement that the interviews were to be coded and anonymous. I will say that the respective respondents includes a curator, an exhibition producer, a museum project manager, a communicator as well as a concept developer and a museum host/producer. They all work for institutions of different sizes.

3.2.4 Working with data
Due to the fact that all interviews were conducted on Skype and were recorded I was able to start transcribing the interviews after they had been conducted. After the transcription had taken place I subtracted the meaning of what was said in all different interviews and started categorizing what had been said. In that way I was able to identify themes and was able to structure what the respondents had said about these recurring themes. By structuring what had been said and was able to find areas where there was overlap, and move things that had been said around finding contradictions, different ways of looking at the same issues. By looking at the results in this way I was able to get a better grasp of everything that had been discussed. My main tools has been concentration of meaning and categorization as described by Kvale (1997).

4. Results
Below are my results from the observational study as well as from the interviews.

4.1 Observations
During my observational study I identified over 100 different types of digital artefacts ranging from interactive quizzes, static information kiosks, database-applications, video & audio-players, interactive visualizations and more. If there were multiple instances of one kiosk I only counted it once. Interfaces ranged from physical handles, knobs, buttons, mice, trackballs and keyboards to touch screens.

4.1.1 Observation 1. Kiosks
In looking at the hundreds of digital devices across the museums I found that at least half of them were information kiosks. Most of them were retrofitting existing types of media into a
new context. For instance, many kiosks I saw showed text, pictures, video and sound, much in ways that has already been done without the aid of much interactivity or digital artefacts. The only exception in this case is that there is room for more information in a smaller space. This is something that has been suggested even to be counter productive as it can distract the visitor and take focus from the exhibition itself (Kelly, 2000). Some of the kiosks were more interactive, presenting quizzes and mini-games. Looking at the kiosks through the lens of the CTA-cycle I found that many kiosks were lacking either primers, referrals or rewards. Only a few of the kiosks had a well designed primer, visible from across the room, that actually encouraged me to use the kiosk rather than just look at the object adjacent to it. The referrals were often well designed, with simplicity a key characteristic, in line with the research recommending “quick victories”. The rewards were of varied quality.

4.1.2 Observation 2: Static content
Very few of the digital artefacts were designed with interactivity that was tied to an overall concept. The interactivity was flat, static and predefined in most cases. To be fair some of the exhibitions were quite old, but one important advantage of digital content is the ease of updating the content. Kiosks generally did not utilize any of the things that would give them advantages over text on a wall or a piece of paper. A lot of the information seemed like it was hard coded into the installation, rather than something connected to the internet. There were no social features and a majority of the kiosks were not great to use in groups, disregarding the fact that going to museums is a social experience. Many kiosks felt more like a case of “set it and forget it”.

4.1.3 Observation 3: Old media in new channels
History has shown that old forms of media do not die, but rather that the delivery mechanisms evolve over time (Jenkins 2001). This is clearly seen in the exhibition halls of Swedish museums. Traditional forms of media is being delivered through new channels. This is however, not the type of interaction I have in mind when I think of digital technology holistically improving the museum experience in exciting ways. The thing I am concerned with is what happens when you add interactivity that is designed to strengthen an overall strategy or exhibition concept. When the interactivity is an integrated part of the museum experience. How can interactions including real social behaviors help shape the experience for visitors to come?

4.1.4 Cross media forays
One exhibition had a large body of objects on show in the main exhibition hall. I later learned that the selection of these objects were selected from the results of a survey. Next to the objects in the hall there were kiosks, prompting the user to cast votes on their favorite objects. The currents standings of the voting were constantly showcased in the the room as well as on the website of the museum. This exhibition shows that you can take advantage of the visitors interactions and use them to present the results across several channels in novel ways.
The second installation using interactivity as an integrated and important mechanic in the concept was an interactive questionnaire-station in an exhibition. This installation allowed a large group of 15-20 visitors to answer questions about the subject matter of the exhibition. People could compete (in a non-competitive way) against each other and guess the correct answer. Each participant had access to buttons with which they could vote on multiple choice questions. Statistics about past answers as well as the ones currently in the room were showcased on the same screen between questions. In this way the interactivity of previous contestants is saved in the installation and is presented to the visitors that come after connecting ties and infusing the interaction with further meaning.

These examples are perhaps rudimentary, but I think that they illustrate that museums are attempting to produce cross media concepts for their exhibitions. They say to me that...
museums are looking for ways to integrate the interaction of the visitors in more meaningful ways than delivering static content through kiosks.

4.2 Interviews
Due to the fact that the respondents in the study have a wide variety of perspectives and roles in the museum world the findings from the interviews are varied and come from different points of view. What I have aimed to do is find themes, commonalities and indications that I can pick out that I think say interesting things about my research question.

4.2.1 Technology in time
One common opinion was that digital interfaces and artefacts age poorly. One respondent compared the aging process of an iPad compared to a skeleton. A 150 year old skeleton will have the same relevance and properties as it had ten years ago in another ten years, whereas an iPad will probably look pretty bad in ten years. The same respondent was also of the opinion that visitors overemphasize the technology and are unable to look past the fact that a piece of technology is becoming old.

Other respondents reasoned along the same lines and gave damning examples of exhibitions where the technology “gave away” their time from where the came and when they were produced and immediately felt out of date or even irrelevant. Respondent #3 argued that one way to combat this problem was to think of the exhibition as something that should be iterated upon and evolved over time. Instead of having standing exhibitions open for 10-15 years the institution should updated and come up with new things, was the reasoning. This is of course not something that can not be done by all museums but I would argue that aging of technology is an aspect of digital design that can be taken into consideration while developing a concepts. If one is working with a 6 month time-frame then this leaves more room for experimentation, whereas an exhibition that will stand for 15 years should be designed with technology aging in mind. Respondent #2 mentioned that sometimes when it comes to digital artefacts less can be more, and that low-tech solutions, even mechanical, can be more effective.

The content delivered through this technology is also subject to the same aging effects. As I found through observations, there are a lot of interactive stations serving static content. One would do well to think of a content strategy that will allow the station to remain relevant if one intends to deliver media in this way.

4.2.2 Technology before, during and after the exhibition
Respondent #1 said something that I believe strikes at the core of my problem with the common design patterns displayed in the kiosks of many museums. “In many aspects, the information kiosk is rather boring. I often get the feeling that I could have just as well read that text on a piece of paper.” While I agree with this line of reasoning, I think it also illustrates the need for more ambitious concepts encompassing more than a screen in the corner of the room. Respondent #4 spoke of how they use different media and that they have the capability to do different things with the visitor. Combining different levels of interactivity is used to an advantage. An inspirational movie can start off an experience and lead to much more interactive and creative activities where the visitors get to produce things
of their own. The visitors imagination is sparked, and knowledge is absorbed without them even noticing it. That becomes apparent in how the following stations are used where signs of learning are obvious.

In general the art museums were more skeptical about the usage of digital artefacts inside the exhibitions, unless it was the actual artistic output of an artist. Respondent #6 talked about audio tours as the most interesting technology that could be used in art galleries, but that it is expensive to create audio tours if you change exhibitions often.

The notion of having a website extending the exhibitions with “pre and after”-experiences was something that most respondents found interesting, and as something that had unfulfilled potential. Respondent #5 said that designing for pre and post-visit experiences encompassing the web is something that will be used more and more in the future, but that it is a new area and not much has been done there yet. The same respondent had made use of websites aimed towards building community around, and relationships with the target audience, as well as collecting material for an exhibition. This strikes me as a great way of making the production process more transparent and involving visitors.

4.2.3 The view of the “technical person” / consultants
Respondent #5 argued that museums need to be better able to develop their own interactive solutions in-house, which has been proven effective abroad. If museums rely on outside help too much there is a high risk of overpaying for services of consultants, was a related point.

Most participants agreed on the point that museums need to bring in technical expertise from the outside of the organization in order to build digital services. There were some things said that indicated that the view of the consultant, was as a technical person with limited knowledge about the museum context, and their target groups. This is a common IT-problem.

One respondent told me that all the research and results from the concept development process is handed over to the producers of the exhibition offering help in grounding the exhibition in the research and that it becomes more of a collaboration. There was a very mixed view on who these consultants are, or should be. The opinions spanned from thinking that they could be collaborative partners, to being seen as something that unfortunately is required in order to get the job done and that the consultant would take the role of “reigning in” concepts that were not technically feasible, while offering alternative solutions to the technical problem.

4.2.4 Technological considerations and co-creation
Many of the respondents mentioned that technology is an added level of complexity for the audience to deal with. Perhaps not everyone has access to the technology needed, or the level of skill or understanding of technology that is needed in order to participate. Respondent #2 argued that this is more a matter of considering the audience. What devices are they using? Just make sure you find that out before you build the exhibition and it is fine, was the reasoning. Another argument was raised against the common anti-technology-complaint: “but not everyone has a smart phone”, and that this should automatically disqualify developing for smart phones. The argument from the respondent was that the same can be
said for any other capability, like vision or movement. There are different levels of accessibility, in other words, and technology is another aspect of this.

My main takeaway from this point would be to echo the sentiment that design research needs to take place in order to understand who the target group is, what technology they are using as well as how skilled they are at using it. Just like in most design processes there needs to be a knowledge about who you are designing for. This type of research is perhaps better done by the museums themselves, who would do well with this information regarding all aspects of their operation, and handing findings and insights over to consultants much like one other respondent whose museum already engaged in co-creation processes with their audiences.

The respondent behind this museum also mentioned the importance of the exhibition concepts growing together with the audience. Instead of designing something so advanced that is perhaps too far ahead of where the audience is comfortable, a co-creation process can help in grounding concepts in the realities of the target audience.

### 4.2.5 Hindering or enabling social interaction

While talking about the role of museums and the way that the exhibition is a way to make cultural history accessible, one theme came up repeatedly. Most exhibitions producers favor interactions between visitors over interactions with digital content. Respondent #1 sees that as one of the core goals of their museum, to get people to interact around the object in question, with discussions of interpretations, and sharing points of views.

Respondent #2 expressed a similar sentiment. Highly interactive and digital installations can be very fun, engaging and effective but they are perhaps more suited to a small group of friends that has some time to spend, whereas it can become a bit of a choke point if there are three classes of students walking through an exhibition, all at once. Due to the high throughput of visitors in the exhibitions the content needs to be engaging and entertaining, but it is not great if a station can entertain just a few users for long stretches of time. Respondent #3 however, was much more positive in the outlook on digital artefacts being used by multiple users simultaneously. Multi touch technology had been employed in their exhibitions with very positive results. Stories about how children were very happy to interact with the technology allowing parents to interact by proxy by helping children read text on the screen indicates that the station, if designed in a certain way, can act as a stimuli for social interaction. The same exhibition also displayed physical models with meta data attached to them that could be accessed by scanning the item. The items then were carrying historically relevant material that could be presented on a screen. This is interesting in the way that it encompasses tangible interfaces and allows for interaction where children can play with, and interact with the physical models, while parents get to access the information on the screen and can discuss its content with them. Another example of how digital artefacts can allow for social behavior.

### 4.2.6 Operational complexity

Another interesting aspect regarding the usage of digital artefacts inside exhibitions in this context is the view of the technological complexities that are introduced by relying on technology.
Respondent #2 expressed that there is a difficulty for museums in maintaining digital elements of an exhibition. According to respondent #2 there are many ideas and cool technologies, along with an interest to use them, both from the digital industries as well as the museums, but that the administration of these systems can be overlooked as well as the reasons for using them. The creation of content was seen as the strongest argument against launching too many content based initiatives, although there were plenty of ideas of what content could be interesting.

Respondent #5 said that fear and unwillingness to use technology from the staff can be a contributing reason behind a skeptical view towards technology. The argument was that if you use the technology as a regular part of the workday rather than once every few years as an isolated initiative it becomes second nature and feels more trustworthy and reliable.

Respondent #1 said that there is nothing more frustrating or annoying than when there are digital elements that are not functioning.

Respondent #3 claimed that one of their exhibition installations was very reliable but that one station was perhaps too complex for the staff to operate. The technology in the first installation was perceived as reliable because it was easy to work with, and allowed the staff to be creative in what objects to use, and that it “always just worked”. However, the more complex installation in the same exhibition needed staff with more technical know-how to operate perfectly. It was not that it broke or was bad, it just had a higher degree of technological complexity.

4.2.7 The physical artefact
Another common opinion is that the physical object trumps any representation of the same object. This is often a question related to the digitization of museum collections. One respondent stated that there is an argument going around, that is becoming less and less common, where the logic goes that people will not want to come to a museum and see an object if it can be seen online. The respondent disagreed with this statement and made the case that seeing an object online would probably only make them more curious and want to see it in real life if they liked it. In any case this is a fear that, even if it is true, there is no way of getting around now. The Swedish government is already urging museums to come up with ways of making their collection available online and the digitalization of society is unlikely to stop. Some respondents were of the opinion that the actual physical object will always trump any digital representation. It think this reasoning comes from the fact that the physical objects are immune to some of the weaknesses of IT systems. They age with dignity and remains relevant as time passes.

5. Conclusions
In the following section I have combined the findings from my study with previously conducted research and have come up with some conclusions. Firstly I would like to say that I found a distinction between art museums and other museums in the way that they think about interactivity in the exhibition space. Unless the artist is working with digital expression there was generally not much interest in making changes to the museum experience by introducing digital artefacts. The interest in using social media, the web, and other digital
channels to extend or strengthen concepts around exhibitions were of equal interest to all respondents irrespective of category of museum. So these conclusions apply more to museums that want to use interactive content.

5.1 Be a service and reframe the question

The cultural preservation business is unique in its mission and requires deep and specialized knowledge in order to do. There is a view inside the business that technical people are not able to understand or appreciate some aspects of their mission. This is a classic IT problem where consultants, while experts in their field, does not understand the context they are designing for. That is why the museum world would be well served to start thinking of themselves as services, and developing digital concepts themselves. This does, however introduce some demands of new skills that are required of museum workers in the future. I will get back to that in my section related to future research.

Nevertheless, museums are services that the population should be able to use in order to learn about, and connect to the particular domain of expertise that the museum is specialized in. If that is the premise from which you base the whole mission of museums it would be easier to apply design methodologies to come up with new and better concepts that are not needlessly tied to an old paradigm and their conventions. The question would no longer be “What digital artefact would be good here, retrofitted on top of the current situation?”, but rather “How can we fulfill our mission of preserving cultural history and making it accessible to the public in novel ways?”. If that answer is by cross media exhibitions, then you are in a great position to produce a strong concept.

It is not easy for an organization to switch mindset like this and have a cross media mindset. Giving the current employees new, sometimes digital responsibilities, while still having to perform the same job they have perviously done, without realigning the business is not a viable tactic. I think museums need to think about what can be removed before they can add something else, and in my opinion some of the focus on the communication-side of museum mission should shift towards designing interesting new services rather that stand-alone IT-artefacts. Some museums are already fully integrating digital workflows realizing that they need to do something in order to be better able to compete in the experience economy that they are part of. Tate Modern for instance have launched a strategy for 2013-2015 where digital is a part of every decision they make (Stack, 2013). This sounds like a great start. A bonus of going digital in this way is that the digital service layer that will eventually surround the whole exhibition will be easier to update and maintain and will be cheaper to iterate upon. Especially compared to physical models or text printed on plaques or walls. Perhaps these advantages can alleviate some of the perceived negative aspects of technology aging.

5.2 Use service design to come up with answers

A lot of the problems that arise when museums start to design digitally is that museums are working against traditions, and sometimes against political willingness to come up with new ways of interpreting their mission. I think that service design could be very well suited as a method of solving the question of “What do we do now?” once they have decided to start
operating more service-like. Some of the things I identified in my study as main problems standing in the way of developing good cross media concepts is unfamiliarity with technology and departmentalized thinking, also called silos.

Service design is multi disciplinary and allows for a zoomed out perspective. It can give more opportunities to successfully work across departments and traditional roles helping to eliminate silos in the organization. The zoomed out perspective, together with a multi disciplinary group can work well to overcome those obstacles as it gives the chance to look holistically at the organization offering, including all customer facing touchpoints. Designing the visitor journey can identify new areas where potential target groups could potentially interact with the museum, and where the museum offering is lacking. In the interviews the skill to know what piece of content is the best suited in what media (and why) was lifted as a key competence in the museum world going forward.

The interviews showed that working with a user centric mindset allows your organization to evolve at the same rate of the audience. You will not go and create something that is far too advanced for the target group if your concepts and systems are built on insights learned from research or further validated through usability testing. This is inherent in service design.

When it comes to concepts designers should try to imbue virtual objects with properties that the physical object can never have. If the digital experience allows the user to trade, own, buy, sell, print, or something else that would never be the case with the physical object, they could complement each other instead of one replacing the other.

5.3 Cross media communication like Hollywood

Most museums right now work in three main areas. Collection of objects (may be digital and physical), working with and doing research on that collection, and communicating the outcomes of this to society in different ways. The exhibition is the most popular and common way of doing so even though there are experiments with fully digital museums (see appendix). It is in this communication that I have suggested service design as a possible way to design holistic cross media concepts going forward. But stepping back a bit I would like to make a parallel with how Hollywood works with communication around their franchises.

Drew Davidsson (2010) outlines the model like this. The Hollywood studio releases a major movie. This is now the tentpole of the story world. Around this tentpole, and inside the story world, the studio can release related content like music, books, games, apps, websites that are either informational, promotional or just exist within the story world. This content can engage allow hardcore fans to further explore the story world after the movie, or it can create new fans, drawing them in. The game, comic book, music record and app all work as pieces of marketing and as sources of revenue. Perhaps this way of thinking about communication could benefit the museum world with communicating their collections and the results from the research they perform on it.

The exhibition would be the tentpole, and by having certain themes, or a story connected to it, the museum get to create a story world and fill it with any content or experiences that they like. These different touchpoints provide links (or loopholes) leading the person to the tentpole production. This content markets the exhibition and gives dedicated visitors the chance to extend their experience. This structure works well in that it utilizes the tiering of
content by allowing audiences of different levels of engagement to interact. The whole campaign can be planned from the moment of inception (the starting point of the experience) to the visit of the museum and the following engagement can be designed for as well, with experiences tailored to post-visit scenarios.

5.4 Usability out- and inwards

My results show that usability issues, and complexity facing the staff is as important as the interfaces facing the visitor. The back-end needs to be designed in line with the capabilities and comfort levels of the operators. Systems that can utilize the creativity of the staff and let them further express the story or message of the exhibition is an area I think it would be beneficial to look into. Perhaps we should look towards building tools for exhibition producers that can be used creatively to produce interactive content across many channels.

However, if organizations take the plunge and decide to go digital, the fear of the unknown will decrease over time. Once you know how to fix a problem it will not feel like it is out of control, or that you are in the hands of the technology.

In the instances where museum staff has had developed digital concepts themselves there was a more forgiving attitude towards usability issues, even if it actually was too complex. Naturally the staff will opt to use technologies that they are comfortable with, so this could be another benefit of letting staff partake in a service design process.

6. Future research

Employing the “Hollywood”-like cross media strategy in creating exhibition content would require some new skills and roles in the museums. Already we are seeing that a low amount of museum workers are educated in the field of museology (Smeds 2007), but there is instead a wide mix of competencies inside the organization. However, cross media or design is not one of the skills being hired for. In future research I would argue that museums are not currently in a place to take advantage of this form of communication unless they are willing to hire people with those skills.

Perhaps storytellers, designers, designers of interactive content, writers, video editors etc would be needed to a larger degree than is currently case. Designers and content producers would have to collaborate with experts in their field to create the things needed to realize any given concept. Looking at the advertising business, for instance, we have seen that the shift from print and TV, and towards digital has changed what skills are desired and hired for. Investigating the changing roles within museums would be interesting.

Another direction for future research would be to evaluate a design process of a museum trying to use service design with the goal of coming up with novel concepts that not only fulfill the core goals of the museum, but do it in a way that is aligned to observed real behaviors of the target audience, and has cross media outlook from the start and evaluate the outcomes.
References


Appendix

Examples
This list is a compilation of examples of novel experiences I came across during the process of writing this paper. They are all employing different aspects of cross media communication that I found interesting. Hopefully these can serve as inspiration as well as clarification of what I consider to be good installations.

Shop Life
A large 25’ table combining RFID, depth sensors and other sensors to combine into a unique situated table where the user can explore by placing physical objects from the exhibition onto the table as well as interact by touch.
http://www.potiondesign.com/project/shop-life/

Väggen (The Wall)
A portable museum about the history of Copenhagen. Placed on the outside of a bus with large touch screens on its sides, the exhibition could drive around Copenhagen. This lead to engagement with a completely new target group.
http://vaeggen.copenhagen.dk/

Vault of the secret formula
Interactive exhibit where a mysterious character stalks the visitors as they enter a top secret place storing the famously secret formula that makes up the Coca Cola recipe.
http://secondstory.com/project/vault-of-the-secret-formula

Art.sy
Artsy is an online platform for discovering, discussing and collecting art and a part of the Art Genome Project. Members can follow their favorite artists, buy works of art or browse art history, techniques, eras, artists. The goal of the website is to foster a new generation of art lovers by making art accessible to everyone.
http://www.art.sy
Appendix

List of museums and exhibitions visited 2013-04-02

- Arkitekturmuseet
  - Arkitektur i Sverige, Riskcenter
- Etnografiska
  - Konstskatter från Benin
  - Mekong
  - Missionsutställningen i Kongo
  - Med världen i kappsäcken
  - Magasinet
  - Nordamerikas indianer
  - Ursprungsbefolkning i tre klimat
  - Dansmaskens berättelse
- Historiska museet
  - Forntider
  - Sveriges Historia
  - Guldrummet
  - Arkeoteket
  - Medeltida kyrkokonst
  - Textilkammaren
  - Vikingar
  - The forty part motet
- Kulturhuset på plattan
  - Hela Stockholm växer
- Kungliga myntkabinettet
  - All världens mynt
  - Spara i bössa och bank
  - Rikets finanser
  - Myntskatternas magi
  - Samlat i kabinett
  - Lovisa ulrikas bibliotek
  - Medaljkonsten
  - Summa summarum
  - Sveriges nya sedlar
- Livrustkammaren
  - Basutställningen (Evigt liv i historien, Rustkammaren, Historisk mode, Kungligt klädd, Kungliga vagnar, Dramatiska ögonblick)
- Moderna museet
  - Moderna museets samling
  - Hilma af Klint, abstrakt pionjär
  - Frontlinjer
Appendix: List of exhibitions visited

- Karl Holmqvist
- Paul Thek
- Surrealismen & Duchamp
- Ulla Wiggen
- Niki de Saint Phalle: Flickan, monstret och gudinnan

- Naturhistoriska museet
  - 4.5 miljarder år
  - Den mänskliga resan
  - Liv i vatten
  - Livets mångfald
  - Natur i Sverige
  - Polartrakterna
  - Skatter från jordens inre
  - Uppdrag: Klimat
  - Naturnära fotografi

- Nobelmuseet
  - Nobelpristagare
  - Tomas Tranströmer
  - Människor, miljöer och kreativitet
  - Making peace

- Polismuseet
  - Uniformen
  - Bilden av polisen
  - Brottspår

- Riksidrottsmuseet
  - Sporthistoria
  - Olympiska spelen
  - Idrott och kultur
  - Idrottsliv

- Sjöhistoriska museet
  - Amphion
  - Klart skepp

- Tekniska museet
  - Kvinnors uppfinnningar
  - Likt unikt
  - Spelet om energin
  - Polhem
  - Älskade telefon
  - Studion
  - Kommunikation
  - 100 innovationer
  - Gruvan

- Östasiatiska museet