

Digital pedagogy at museums
for increased participation and co-creation

A handbook
for museum professionals

Gustav Wollentz

For Aurora, my light, my heart

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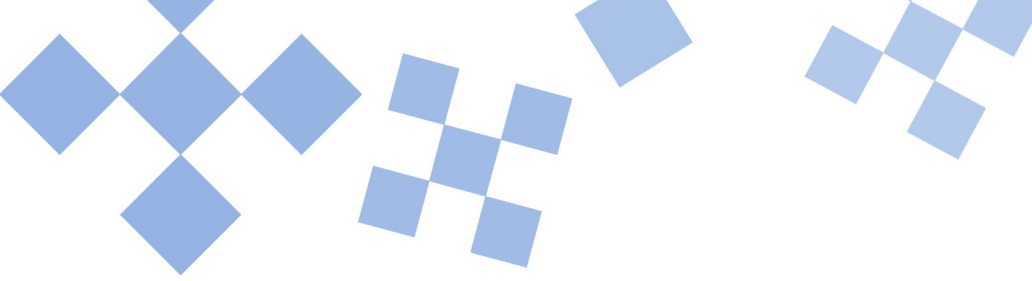
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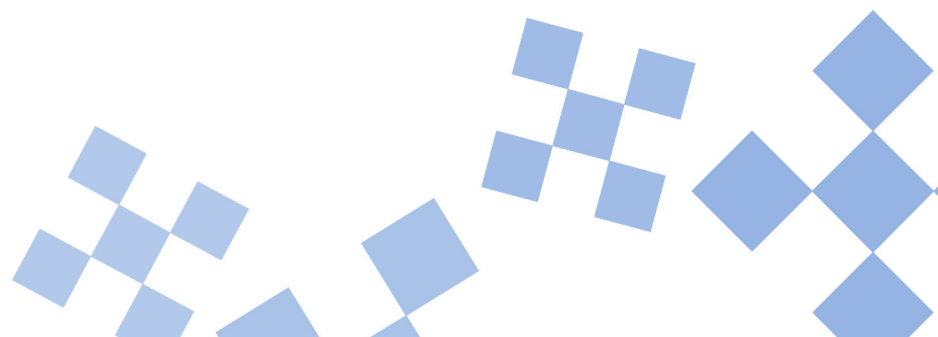
And finally, a major thank you is directed to all the people who answered the survey and who participated in interviews, providing essential insights shaping the contents of this book.

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Chapter One





The world is constantly changing and so are the roles of museums.

The last few years have been marked by unprecedented changes. A global pandemic, an accelerating climate crisis, and wars in Europe and beyond. The future may never have felt as uncertain to navigate as it does now. Specific digital tools became helpful assistants during extended periods of lockdowns as they made it possible for museum educators to keep in contact with the public. Through digital tools, our own isolation became more manageable as we could socialize and continue being active online. But what is the role of the digital in a post-pandemic world? And perhaps even more importantly: how do we make the most of the lessons we have already learned in digital pedagogy so that the work we do continues to be relevant now and in the future?

This book is directed toward museum professionals who want to expand and innovate their work in outreach through digital means. Learning, participation, and co-creation are central concepts in the book. The book is relevant for people holding different capacities at the museum: especially museum educators, exhibition producers, communicators, and museum directors. This does not mean that only museum professionals would find the book useful. What works in a museum context can often be adjusted to other contexts as well. Everyone is welcome to read the book and hopefully find inspiration and new perspectives.

The purpose of the book is to provide food for thought in how to work with digital tools in outreach, and on occasion, to challenge old ways of working and thinking in museums. It is most often the capacity to imagine how to do things differently, rather than the limitations of the technology per se, that poses the greatest challenge to museums in an increasingly digital, or even postdigital, society. Focus will primarily be on how digital technology can help museum professionals stimulate active participation and co-creation with an audience. We do not only address completely online pedagogical programs, but we are also looking at how the digital can enhance the outcome and offer a new pedagogy in the museum – a (post)digital pedagogy.

1. Introduction

We apply the concept of the postdigital as a theoretical lens to approach this. In a postdigital museum (Parry 2013), there are no clear-cut distinctions between digital and physical outreach, but rather a seamless integration with no clear boundaries between the two, and where the digital is not siloed into specific departments (Parry 2013; Bowen & Giannini 2019, 561). We argue that a move towards the postdigital museum, characterized by an increased blurring between digital and physical (also called phygital), is the next step for museums to take to embrace a digital future more proactively. In the chapters of the book, you can dive deeper into how you and your museum are in the process of transforming into a (post)digital pedagogy.

Instead of placing primary focus on the tools themselves, we will focus on what educational forms that emerge through using digital technologies. Primarily we look at how they can enhance participation and co-creation. While we will mention the names of different digital tools throughout the book, and there will be a list containing useful tools and resources in Appendix 1, these tools will not take a central role. First and foremost, this is because digital tools are not an end in themselves, but a means to reach certain ends. It is through a meaningful use of digital tools that truly participatory and co-creative exchanges can occur. In other words: we will focus on what new possibilities digital tools can enable for co-creating meanings together with an audience. Specific tools come and go very quickly. For instance, it is hard to know for how long tools such as Zoom and Prezi will be relevant for presentations. Furthermore, how to use these tools can change from one day to another as soon as new updates are released. Nevertheless, it is likely that outdated tools will be replaced with other ones that can enable more options.


Furthermore, the digital tools available are often developed by non-transparent organizations where it can be difficult to know how data is stored and used. In addition, it is not always possible to combine the use of commercial tools with overall goals of widespread accessibility. When possible, rely on platforms and tools that are non-commercial, open and collaborative, such as Europeana by the European Union or Wikipedia by the Wikimedia foundation, for making heritage accessible and available. Furthermore, the webpage of the museum will maintain significance also in the future (Grinell, Lindblom & Wagner 2023). Nevertheless, there are many tools that most museums will have to rely on, at least for the time being, despite being developed by large commercial entities. Just to mention one example among many would be the use of Facebook to maintain a social media presence.

Through a survey broadly sent within the museum sector in Sweden, Finland, and Estonia, as well as follow-up interviews with selected individuals, we have identified a set of key challenges that have informed the chapters in the book.

Identified key challenges:



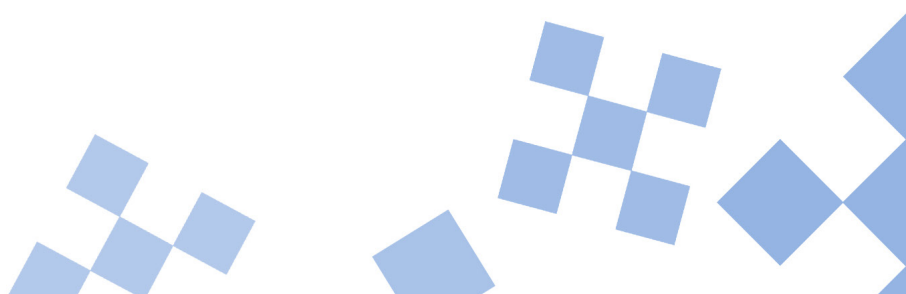
- How to meaningfully connect and even move beyond the dichotomy between digital and the physical in outreach (e.g. how to move towards the postdigital museum)
- How to stimulate active participation and co-creativity by digital means
- How to achieve a more long-term focus and agenda in digital outreach
- How to get the most out of digital outreach in the face of limited resources and time



This book is not intended to provide easy solutions to these challenges. It does not give a blueprint or a set of actions that can simply be implemented. What would work for one museum might not be suitable for another.

There are no one-size-fits-all approaches. Instead, the book will hopefully expand your horizon by providing more options and possibilities on how to engage with digital tools in an innovative, critical, and inclusive way that is aligned with the goals and resources at your own institution.

Throughout the book, we will constantly try to address solutions that are reasonable within different types and sizes of museums, and connected to various target groups, aims, and objectives.



THE PROJECT DiSAH - Digital solutions for applied heritage



The project group gathered at The Estonian National Museum

In 2021 The Nordic Centre of Heritage Learning and Creativity (NCK), together with Jamtli, Kalmar County Museum, the Estonian National Museum, the Audentes school and the Children's Cultural Network in Ostrobothnia (BARK) started a project funded by ERASMUS+. The project is named Digital Solutions for Applied Heritage - Exploring Transnational Learning Opportunities (DiSAH). We also benefited from the advice and assistance of three associate partners: Lennart Rolandsson from Uppsala University, Bodil Petersson from Linnaeus University and Linda Mannila from Linköping University and Åbo Akademi. This book is written within the framework of that project. Here we cover many of the lessons we have learned when working on the project. See Appendix 2 if you are interested to learn more about what motivated each project partner to join the project, and what kind of challenges we were facing.

In DiSAH, we have been developing and piloting new educational programs using digital tools. One benefit of the project is that it has given us the opportunity to work in a highly experimental way to test, evaluate and adapt different solutions. A major focus has been on how digital tools can encourage active participation in what we call transnational learning, which means learning that builds bridges across national boundaries, bringing together people from different countries and focusing on themes such as migration, movement and escaping war. Some of the programs have been online visits and others have blended online and on-site activities. Many of the programs have been focusing on developing digital opportunities in roleplaying and time traveling, as several of the project partners are members of the international organization Bridging Ages, which is focused on time traveling as a learning tool to critically discuss and reflect upon relevant issues in the present, such as inequality, racism and sexism (Westergren & Wollentz 2018). However, the focus has been broad, and this book will reflect a vast variety of entrance points to digital pedagogy in museum settings.

It is worth noting that uncertainty and transformation very much followed us throughout the whole project period, and guided us in our approaches and methods. We wrote the project description during the fall of 2020, when COVID-19 was relatively new and museums were still focused on fully online digital solutions. When the project started in June 2021, the landscape had further changed and hybrid and blended solutions became more common. At that point, the concept of “digital fatigue” started to be well-known.

In February 2022 **Russia launched a war in Ukraine** and suddenly we felt a need to focus on other urgent themes and concerns in relation to transnational values and learning. The war in Ukraine informed the theme of a transnational time travel that we carried out in May 2023, connecting 164 eighth graders in Estonia, Sweden and Finland. While the time travel went to 1944 at the end of WWII, the purpose was to draw links to the present times and particularly the war in Ukraine.

We explored the following questions in the transnational time travel:

How is it to be a teenager when the world is on fire?

What can you do to help others who are fleeing war?

You will read more about our transnational time travel later.



The insights that we draw upon in this book come from three types of sources that we have gathered throughout the project:

1. **Results from activities in the DiSAH project.** This constitutes lessons that we have learned when developing and piloting educational programs within the DiSAH project.
2. **A survey and in-depth interviews.** As mentioned above, we carried out a survey within the museum sector in Sweden, Finland and Estonia, as well as follow-up interviews with selected individuals.
3. **Research overview.** We carried out a research overview on digital solutions for co-creation and participation at museums which moved beyond the Nordic/Baltic context.

Before we go further into the results, it is useful to explain what we mean by certain concepts and tools.

CENTRAL CONCEPTS

Digital pedagogy in museums

With digital pedagogy we mean how digital tools can be used to enhance learning and outreach activities. It can be both in a completely online setting, or when digital tools are added to a physical setting to increase learning. The main lesson that we can draw from our own project in regard to digital pedagogy is the value in determining what kind of learning outcomes you aim for, prior to choosing which digital tool to use. In other words: choose digital tools and approaches depending on the learning outcome you would like to achieve, not the other way around.

Co-creation

Co-creation is a process of building trust through a more equal ownership of the process and the outcome. Exactly how this can play out can take many different educational forms, but on a fundamental level, it needs to be a less hierarchical and more participatory way of engaging with a target group, where everyone has the opportunity to contribute in shaping the process and the results.

Learning

We approach learning as a lifelong process that happens in many different situations and can have several consequences for the audience. It can occur in the context of formal learning which often takes place in a classroom, informal learning which for example can take place when you visit a museum (either on-site or online), and non-formal learning which takes place outside of formal learning situations but which is more organized than informal learning, for example in a literature circle. We have a broad understanding of the outcomes of learning, beyond only acquiring new knowledge through facts, to also include behavior, skills, attitudes, values and creativity.

Time traveling

Many partners in the DiSAH project are working with time traveling as a pedagogical method. Time traveling is a form of roleplaying activity where participants take on different roles in the past (or even in the future) where they have the possibility of making decisions and influencing the story in various ways.

Hybrid and blended

With hybrid we refer to activities where some participants are joining on-site and some are joining online. It can be a live event that is being broadcasted digitally, or a set of multiple interconnected events where some parts are online digital and some parts are on-site. It can also be a type of activity where those who are participating on-site are having exchange and communicate with participants online in various ways. We define blended activities as those where the same participant must go through both on-site and online activities. Both hybrid and blended activities can greatly increase accessibility for people who live far away from the museum

DIGITAL TERMS

Digital escape rooms

A digital escape room functions in a similar way as one on-site only that it is done in front of a screen. By carrying out tasks and solving puzzles, preferably in collaboration with others, the participants proceed further until they solve the whole game. It is also possible to develop hybrid or blended escape rooms, where some are participating online and others in a physical room, collaborating and communicating in various ways.

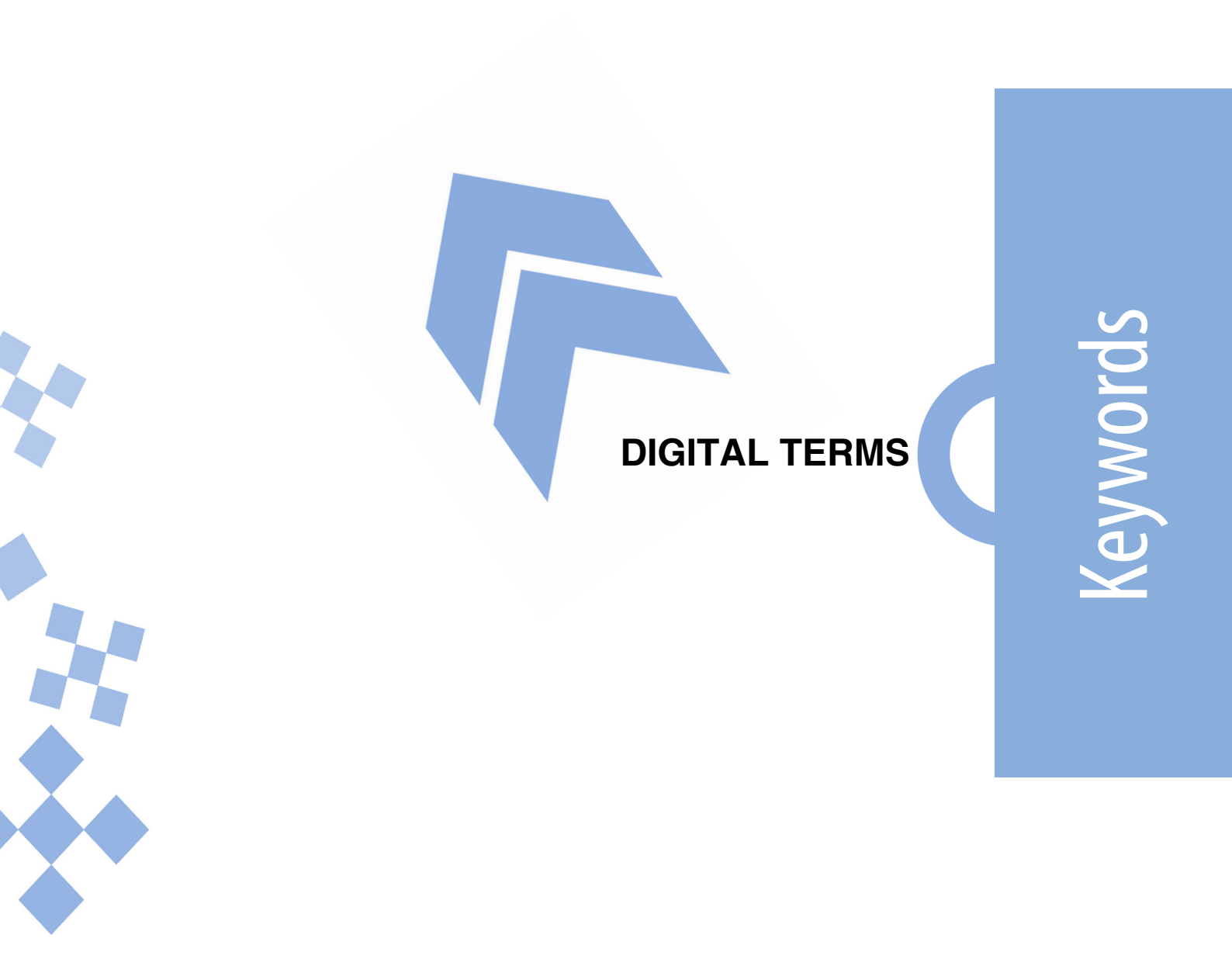
Extended Reality - XR

XR is a term used for different types of immersive experiences using digital tools. Most often it is used in reference to *Augmented Reality (AR)* and/or *Virtual Reality (VR)*.

AR combines a digital and physical experience through creating a lens to the digital world while often still being immersed in the sounds, smells and sights of the “real” world. This is most often achieved through an application on the phone or the tablet. However, there are also AR glasses. A famous game based on AR is Pokémon Go, where you can use an application on the phone or the tablet to hunt Pokémons’.

VR is a more immersive experience than AR in the sense that more senses will likely be involved. Most often, a headset will make users engage both with visual elements and recorded sounds. It is also likely that haptic technology will make a sense of touch more common within future VR experiences. VR makes it possible to explore virtual spaces, by looking in different directions, moving around and interacting with objects and other people.

Motion capture is a way to trace the movements of your body through markers placed on your body. These movements can then be used to animate digital characters, who are performing dances, acrobatics or whatever movement you choose to carry out. For example, motion capture can be used to animate characters/avatars in shared VR experiences.



Today's digital pedagogy in museums

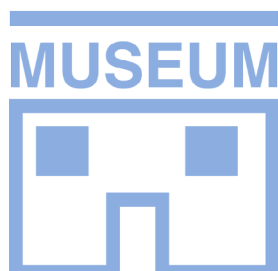


NCK carried out a survey in late 2021 and during the spring of 2022, with follow-up in-depth interviews. It was sent broadly within the museum sector in Sweden, Finland and Estonia. Our aim was to get a better understanding on how museum educators use digital tools in their outreach activities, what the major challenges are and how they have worked to overcome those challenges.

By doing this, we identified four key challenges where more work is needed, as well as found inspiring examples to learn from.



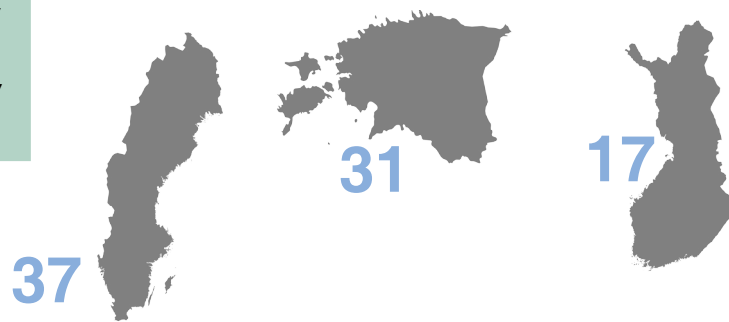
The key challenges were introduced above and concerns **1)** How to meaningfully connect and even move beyond the dichotomy between digital and the physical in outreach, **2)** How to stimulate active participation and co-creativity by digital means, **3)** How to achieve a more long-term focus and agenda in digital outreach, and **4)** How to get the most out of digital outreach in the face of limited resources and time.



The survey consisted of 32 questions and was conducted with the tool Crowdsignal (see Appendix 3 for the survey results). We used the museum associations in each country to find museums and circulate the survey. We included small museums with 6-15 employees, and large museums with 100 employees and above, as well several mid-sized museums. We also captured different forms of museums, e.g. regional cultural historical museums, city museums, science museums, university museums, design museums, as well as both public and private museums.

In total 85 museums answered, and the numbers per country are:

Sweden:	37
Estonia:	31
Finland:	17
Sum:	85



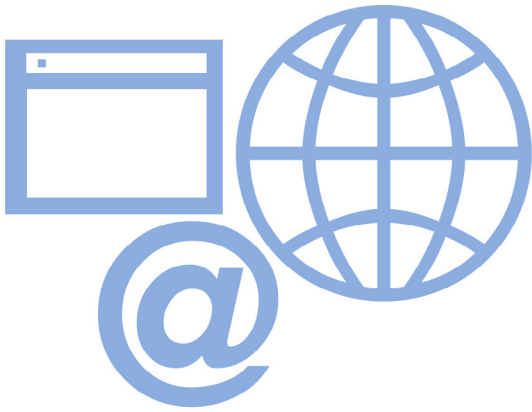
We also carried out nine in-depth interviews (Sweden: 4, Finland: 3, Estonia: 2) with selected individuals whose experience we deemed particularly interesting. In these interviews, we focused particularly on questions related to co-creation and active participation.

THE RESULTS show a great interest among museums in Sweden, Finland and Estonia in further exploring digital tools for outreach beyond only making it a substitute for an on-site program.

Currently, Zoom, Teams, and YouTube are the most common tools to use, often for the purpose of showing the exhibits, the collections or providing information about the museum and its activities. Museums are also highly active on Facebook as social media, but much less active on other social media platforms such as TikTok or Snapchat. Activities focusing on Extended Reality (XR), such as Augmented Reality (AR) and Virtual Reality (VR), are occasionally developed at museums.

However, while the numbers vary between the countries, approximately 20% of the participating museums have worked with XR within their educational activities. When developed, it is most often produced through contracting external companies and financed through project funds. Many museums lack the resources for XR but are instead looking to find innovative ways to stimulate and engage through digital means with available resources and technology.

This is why we in this book will also focus on digital solutions that do not require expensive licenses or more advanced digital skills. We hope that the insights can be tailored to various needs and levels of experience.



Due to COVID-19, museums had the opportunity to rapidly advance their digital pedagogical programs to maintain contact with a target group. Initially, this often took the form of substituting on-site activities (such as a guided tour through the exhibits) by digital streaming through Facebook and/or YouTube. Further on into the pandemic, more innovative solutions were developed, which did more than only substitute an on-site program. We will provide some examples later in this book.

Based on the survey and the in-depth interviews, a few general conclusions can be drawn.



- Many museums digitally mobilized their outreach activities because of COVID-19. However, these responses seldom had long-term perspectives in mind.
- Many museums still have not transferred the lessons from these short-term initiatives into long-term strategies tied to the overall goals of the museum.
- While approximately half of the museums participating in the survey (Sweden 59%, Estonia 55%, Finland 47%) are working with digital tools to stimulate active participation and co-creation, they often find it difficult to achieve in practice.
- Many museums are unsure as to how the digital and the analogue can best complement rather than substitute each other in different learning situations.

Many of these results are not isolated to a Nordic/Baltic context but correspond to other studies on European (NEMO 2021), American (Knight Foundation 2020; American Alliance of Museums 2021) and global (UNESCO 2020; ICOM 2020) scales. An important insight from the global studies from UNESCO and ICOM is that the so-called digital divide is increasing worldwide, which means that the possibility of digital outreach at museums varies considerably from country to country. While a social media presence is common all around the globe, other types of digital outreach is much less common in some parts of the world, for example in African and Arab countries (ICOM 2020). It is also important to recognize that size and location matters. According to a survey distributed to 600 museums in Europe, small and medium-sized museums show a greater need of help in the digital transition, in comparison to large museums with over 100 employees. According to the same survey, the need for help is less pronounced in capital areas than in other regions of a country (NEMO 2021).

Our survey and interviews show that many museums are still exploring how the digital can open new and different possibilities for learning and pedagogy. In short, we found that museums are in the process of developing a digital pedagogy, and this transformation has escalated because of COVID-19. While COVID-19 certainly accelerated the development, the initiatives centered upon answering immediate needs within a very specific context. Museums are now trying to navigate a post-pandemic world marked by “digital fatigue” and social isolation. Many museums participating in our study are unsure as to how to move forward in this new world in the best way possible, and need help and advice. We hope that this book can be a useful resource to open new and more sustainable ways forward.



Structure of the book

This book will focus on four themes based on the key challenges identified above, which will cover one chapter each.

Chapter Two

Expanding the digital experience by challenging boundaries

Chapter Three

The meeting point between the digital and the physical

Chapter Four

The digital as a resource to achieve co-creation in practice

Chapter Five

Finding long-term and sustainable structures for digital outreach

While Chapter two, three and four primarily concern pedagogical programs and exhibitions, Chapter five discusses organizational structures at the museum. Each chapter is also including examples of activities developed within the DiSAH project that are meant to provide practical insights based on lessons learned throughout the project.



Chapter Two



2. Opportunities and challenges in a postdigital era

Expanding the digital experience by challenging boundaries

One way to approach the digital is to see it as a means to expand the museum experience by challenging boundaries and creating more emotional, affective, and memorable moments.

When museum thinker **Sandro Debono** (2021) applied methods from anticipation and foresight (Miller 2007), to develop possible future scenarios for museums in a post-pandemic world, he developed five different ones.

They form a good starting point for this chapter, as they give plenty of food for thought when it comes to reimagining the museum.

Before presenting them, it is important to highlight that **future scenarios are valuable**, not because they can predict the future - they are in fact unable to do that - but because they can expand our practices and ways of thinking today. They can make us see the present, and **opportunities to make positive change**, within a different light.

Scenario 1

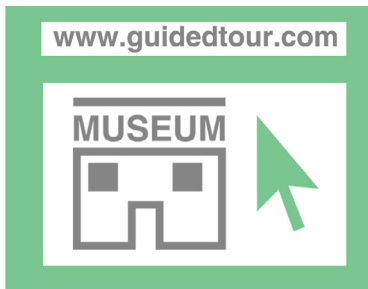
The first scenario is a maintenance of status quo, a museum experience which is almost completely physical and where there is a lack of interest among museum professionals to engage with the public by digital means.

The limited online presence is rather of a “token” quality, which means that the museum usually has a web page and social media account because it is expected to have one.

The sole purpose of the limited digital activity is to attract visitors to the physical museum. It is a museum where the physical museum space and the objects on display are what matters. This kind of museum had to either change its way of working or close during COVID-19.



Scenario 2



The second scenario is one where the museum is focusing on producing digital content but only as a substitute to the on-site experience, a form of replacement, but with the same kind of value and experience for the public.

When COVID-19 hit the world, this was the type of digital content that many museums initially started preparing in order to have some degree of interaction with an audience.

The most common form would be digital guided tours through the museum exhibitions without any additional elements added to a regular guided tour. It often constitutes a more restricted - even inferior - “online twin” to the on-site experience.

Scenario 3

The third scenario is one where the digital outreach is available mostly in the purpose to guide, point or drive people to the physical museum.

The content is different and can serve as an excellent complement to the on-site experience, but it will also include subtle promotion or incentives to visit the museum.

The physical space of the museum remains an ever-present backdrop to the digital experience.



Scenario 4

The fourth scenario is one where there is an equilibrium between the physical and digital. In this scenario the digital and physical are deeply interconnected, and where you can switch between the digital and physical in a seamless and integrated way.

Here, the museum exists in many different forms, platforms, and spaces, way beyond the walls of the physical museum building. These integrated experiences are not disjointed, but all form jigsaw pieces of a larger cohesive puzzle. This way of working may seem distant for many museum professionals as it often would require a complete shift in how the museum is imagined, less oriented towards presenting physical objects. Instead, the public has a larger freedom to set the terms for the experience, in regards to how it is experienced and what kind of interaction that is possible. Objects may still be important, but only as a part of a bigger experience.



This is the scenario most closely aligned with what has been called the postdigital museum (Parry 2013), characterized by an increased blurring between the digital and the physical, where those very distinctions are becoming less relevant and even invisible (Bowen & Giannini 2019, 561).





The fifth scenario is one where the museum exists completely in the digital realm, and the physical part is very limited. Even if this scenario is currently uncommon, there are digital museums, such as the Museum of Portable Sounds, which is interesting to provide as an example.

Museum of Portable Sounds currently has “325 sounds [...] on display in our museum [that] has been carefully curated to tell engaging stories about the fascinating – and often overlooked – roles that sound has played throughout history, science, art, and culture.”¹

It is possible to book an online visit to the museum through Zoom, to hear the sounds and, when possible, see some of the objects behind the sound in question. As museums are reimagining their role in society, in which methods of interacting with the public are constantly evolving, it is to be expected that there will be more museums in the future that primarily will exist in the digital sphere.

However, this does not pose a threat to the physical space of museums, nor to the value in tangible objects or heritage landscapes. On the contrary, research suggests that the digital will make people more interested in on-site and place-specific experiences (Burlingame 2022).

1 <https://museumofportablesound.com/collections/sounds/>

The purpose of presenting the five scenarios above, identified by Debono, is not to argue that one scenario is superior to another. Rather, it depends on the specificities of your museum; its resources, and the type of audience you want to reach.

It is important to acknowledge that the last three generations (Gen Y, Z and Alpha) are largely digital natives. These are generations who grew up with digital tools from an early age and who will have certain expectations on the museum. This will make it difficult for museums to stay relevant in the future unless digital solutions are embraced, at least to some extent. It is possible to strategically include elements from several of the scenarios, as the distinctions are not completely clear cut. The value in the scenarios is that they can help you reorient the practices at your own museum more aligned with overarching goals and objectives.

*** PLEASE** take a few minutes and consider the five different scenarios in relation to the following questions.



- In which scenario would you situate the museum you currently work at in terms of digital outreach?
- Towards which scenario would you like your museum to be heading? Why?
- Are there any current practices at your museum that would need to change for the museum to head in that direction?
- Are there any current approaches and ways of thinking that would need to change for the museum to head in that direction?
- How can you start working towards such a change? What actions can you take? What new kind of strategies would be required?

In the next part of this chapter, we will primarily focus upon how the museum can take steps towards scenario 4, that is, a more interconnected relationship between the digital and the physical, where the switching between the two can be seamless and part of a more cohesive and integrated experience.

However, there will also be connections to scenario 3, in which the digital content is pointing people towards the physical museum, and vice versa, as the on-site content can also guide people towards the digital. The overall aim is to explore how the digital can expand the experience by challenging boundaries.

We will do it through the following points:

- Expand by engaging **with multiple senses**
- Expand by engaging **with multiple places and times**
- Expand by engaging **with emotions**
- Expand **by crossing barriers**
- Expand **by moving behind the scenes**

● Expand by engaging **with multiple senses**

Working deliberately with as many senses as possible will create more memorable, transformative, and creative experiences. Multisensory museums can provide a more personalized interaction, with the ability to trace emotional links to other times and people. It is likely that museums in the future will engage with all the five senses (smell, touch, taste, sight, sound) in a much more deliberate, thoughtful, and innovative way than most museums currently do.

Taking the five senses as the essential elements of the ideal museum experience, the authenticity of digital soundscapes, or lost voices recovered from distant histories, can be as authentic as a painting hanging in a physical museum space. Indeed, it might also be the case that a greater command of the digital-visual by museum publics might overlap with other sensory experiences such as sound, or its derivatives understood to evoke touch (texture) and taste (food). In this respect, the phygital [combination of digital and physical] holds significant potential to empower the personalisation of the museum visit (...). (Debono 2021, 161)

To allow for people to engage through multiple senses by digital means is called Internet of Senses (IoS), which is a field that is expanding rapidly through tools of Extending Reality (XR) such as Augmented Reality (AR) and Virtual Reality (VR). These tools are most often used to provide augmented vision and hearing. However, it is likely that other senses such as augmented touch and smell will be more common in the future.²

For example, by using so-called haptic technology, which creates an experience of touch, it can be possible to study models of atoms using your hands to pick them apart. This provides a tangible dimension to something as elusive as atoms which can increase learning and entertainment (Kairos Future 2020).

Furthermore, with the use of motion capture, the movements of your own body can be tracked to embody figures, such as rock art figures at Österlens museum (Pettersson 2014) or allow you to become the fifth member of Abba at the Abba Museum (Wollentz et al. 2022). In motion capture, the movements of your body are recorded through markers on your body and then used to animate computer generated characters.

These kinds of tools have the potential to provide a much more immersive experience that manages to blend the physical and the digital. They can also help us move beyond the boundaries of our own bodies, and make us experience places, buildings, smells and sounds that have been lost over time or that may never even have existed before - but might be possible in the future. They can expand our minds and broaden our horizons.

We know that not all museums have the resources or expertise to develop immersive experiences using XR tools such as AR and VR or motion capture. As mentioned in Chapter one, our survey and interviews show that when VR or AR is developed for museums, it is most often through contracting external companies. This tends to be expensive and funded through specific projects. While AR and VR will become more common and cheaper to develop in the future, there are many other ways to create immersive and multisensory experiences through innovative adaptation of easy-to-use technology that is available for free.

One inspiring example we came across in our interviews comes from the Museum of Design and Craft, Röhsska, in Gothenburg. They explained it in the following way:

² <https://cordis.europa.eu/article/id/435493-virtual-touch-and-feel-a-new-frontier-of-digital-reality>

there has been [a value in] us standing outside the museum and filming the museum, they [the pupils] don't get to see anything but just listen, and use that sense to figure out where we are. They hear trams, they hear cars honking, they guess; "you are outdoors". Something about the interactive element made the children feel like they were there, which was effective. It is positive to work that way. The goal, the hope, is that the children and young people will come to the museum. Then it fulfills a function to show what the museum looks like. When they come to the museum perhaps for the first time, (...) they recognize themselves and have "been inside" the house. We think that it is a good method to use in the future, perhaps school students who need to get an introduction, who need to (...) feel safe.

This is an excellent example of how it is possible to use sounds, such as that of trams and traffic, to stimulate curiosity and discovery which enhances participation and learning. It is significant that it was a live-experience, and not prerecorded. Otherwise, the same type of interaction would not have been possible. Furthermore, a different type of experience was created by "restricting" the pupils to only use their ears to listen to the sounds, and their voices to ask questions, while not providing visual clues. This shows how one can work in a deliberate way with the five senses, stimulating some while "removing" the possibility to use others in a thoughtful manner. In line with Debono's five scenarios presented above, this connects primarily to scenario three, as it is an experience which uses the physical museum building as a backdrop to the digital experience, with the purpose of guiding people to the building by inducing a sense of familiarity and safety.



Reflect upon this!

- Which of the five senses are you most often engaging with through your work at the museum?
- Are there any senses that you never engage with? Which ones?
- Why are you never engaging with them, and what do you think would be the benefit?
- Do you think digital tools could help you in the process of engaging with more senses? If so, how?
- Do you think it could be possible through free and easy-to-use digital tools that you are already familiar with? If so, how?

● Expand by engaging **with multiple places and times**

The digital can expand the rooms of the museum by creating new stories and connections (Hylland 2017). The physical museum building will likely continue to be of vital significance for most museums, and the digital will not change that. The physical building provides a social base for the employees and/or volunteers at the museum to meet and exchange ideas and perspectives. Further, it often curates an impressive collection that needs care and attention, and it is a space to engage and interact with the public. However, it is important not to let the physical building restrict the way digital tools can open for an expansion moving way beyond its very walls.

Being able to expand the rooms of the museum by digital means will be one way to engage with a global audience rather than only a local one. It can vastly increase the relevance and impact of the museum by making it possible to reach out and make a difference to people who live far away, even across the globe. Museums in the future will likely engage with global audiences to a larger extent than now, due to the rapid development of technology and a more interconnected world with widespread movements of people. The future will likely have larger diasporic communities (Heritage, Iwasaki & Wollentz 2023). Engaging with an audience that will be increasingly transnational will put high demands on the museum to find meaningful connections, making exhibitions relevant, relatable and accessible within a wider context and towards a broader spectrum of the population. Here, the digital will prove essential.

When the research and consultancy institute Kairos Futures, sketched out future trends for organizations working within the edutainment industry (the blending of education and entertainment), including museums, they conclude that there is a need to expand beyond the walls of the organization in four different directions (Kairos Future 2020, 30):

1. From the internal organization towards building partnerships and networks
2. From one building towards many places
3. From a physical place towards a digital presence
4. From one visit towards an extended before and after

Let us focus specifically on extending the experience in time. We will further elaborate upon this in Chapter three, where we discuss the value in using digital tools before and after an event to prepare, plan and gather regular feedback. However, an expansion in time has wider implications than so. Consider how tools such as the one called Deep Nostalgia, developed by MyHeritage, can animate people in old photos through Artificial Intelligence (AI), making long gone relatives seem alive and talking, laughing, singing, or moving.

For some, this technology makes it easier to relate to them as people. Applications such as these took the internet by storm in 2021 as many of them are available for free. They are also sometimes used by museums, especially to create engaging and fun material for social media. You have most likely seen these kinds of photos on your own personal social media flow. This is one example of how the digital can create new kinds of emotional connections to people in the past. However, this service also raises ethical concerns as it can be misused to spread disinformation and fake news. Just as emotional links to the past can be created through digital technology, so can connections to the future. For example, using XR, possible future scenarios can be experienced.

Can you imagine a multisensory experience of a possible future, including how this future might feel, smell and sound, with the possibility to convey messages to people living in that future? Digital tools can help connect past, present, and future people in new, completely novel, ways.

● Expand by engaging **with emotions**

The museums that manage to create the most memorable and transformative experiences are museums that convey strong emotions. Research has demonstrated that people often visit museums to get their emotions confirmed, and that it is very difficult to challenge emotions and make people feel differently about a particular topic (Smith 2020).

However, sometimes we need to get our emotions challenged and receive incentives to feel, think and act differently— especially since our emotional responses to topics can be biased, uninformed, or simply outdated. That is what a truly transformative museum experience would entail.

Archaeologist Sara Perry, in collaboration with other researchers within an EU-funded Horizon project named EMOTIVE, has argued that digital tools can be an excellent resource to challenge our emotions and the underpinning preconceived ideas, making us feel differently about things (Perry 2019; Perry et al 2017). The project consortium developed emotional and affective encounters through the following digital applications, that can be adapted to different contexts (Perry 2019, 363):

1. 3D prints. In the exercise people make their own 3D objects out of known artifacts, such as famous archaeological finds, which are then printed using a 3D printer. People can decorate the objects themselves, creating an emotional link to the 3D printed object. The task can spur a critical conversation surrounding the value of authenticity, and what constitutes an authentic object.
2. VR experience where many people can interact with both each other and with physical and digital objects simultaneously, blurring boundaries between the digital and the physical.
3. Chatboxes, built around AI, which are centered around asking challenging questions rather than answering them, forcing people to critically assess their own standpoints. This contrasts vastly with the currently-famous AI ChatGPT, which answers questions (quite often incorrectly) but never asks questions and thus never forces the user to critically reflect upon her/his own views.
4. A mobile application, which enables visitors to narrate their own stories of visiting a heritage site, rather than getting stories narrated to them. In this case, tour guides are focused on facilitating dialogue and a sharing of experiences.

Affective and transformative digital experiences include social interaction and creativity.

The four points above constitutes how the EMOTIVE project engaged with digital tools to create affective experiences which could make us feel and think about things differently. Some of them are more demanding to realize than others, requiring certain tools such as a 3D printer, while others demand less resources, such as designing an application for the phone. These examples are useful to expand our perspectives concerning the range of possibilities.


It is worthwhile to highlight that these four points have two things in common: social interaction in the sense that dialogue is central, and creativity in the sense that people are participating in creating objects, narrating stories or answering questions. The value in social interaction and creativity to stimulate emotions through digital means was also often brought up in our own interviews, confirming that they may be a key in achieving a more emotionally transformative experience.

There is an additional point to be made regarding the relationship between human emotions and emerging technology. We live in a time where museums can serve a vital contribution in today's increasingly digital society, as museums tell important stories about what it means to be human, ranging from the deep past, to the present and even into the future.

These stories are highly relevant in the light of the expanding role of AI, such as the currently much debated ChatGPT, and its limitations (Högberg 2023). The development of a more ethical AI sensitive to human values and needs is likely one of the key challenges for the future (Heritage, Iwasaki & Wollentz 2023). In a story of what it means to be human, emotions need to play a significant role, because what would the human experience be like without emotions?



Reflect upon this!

- 
- What kind of stories do you think provide perspectives upon what it means to be human based on your own experience in storytelling at the museum you work at?
 - Is it the small-scale biographical or the large-scale collective story, or the story that manages to switch between the scales, positioning the individual within the larger picture?
 - What role would you say emotions play in these stories, such as nostalgia, longing, love, joy, fear? How do you engage with these feelings in the storytelling at your museum?
 - Based on what you have read here, do you think digital tools can help you create a more emotional experience at your museum? If so: how?


● Expand by **crossing barriers**

There are many barriers that digital tools can help overcome. We mentioned above that digital outreach can make museums connect to a global audience. This can create transnational connections leading to new meetings and an exchange of perspectives, often essential to broaden minds and challenge preconceived ideas. Even though language remains an obstacle to overcome in such interaction, there are ways to stimulate a sense of connection through digital tools.

As mentioned in the introduction, in the project that led to this book, we developed a transnational time travel, tested in the spring of 2023, connecting 164 pupils from 8th grade from Sweden, Estonia and Finland in a set of interconnected events, with the purpose of moving beyond narratives using the nation as a basis (see Example 1 to read more about this experience). When bringing all the pupils together through Microsoft Teams, we used the interactive software Mentimeter to let the pupils answer questions and reflect upon their experiences together with others. The answers from the Mentimeter could be displayed anonymously for everyone to see, in graphs, tables, and word clouds among other things. The benefit of interactive tools, such as Mentimeter, is that people can be active and express their opinion and perspective even when they are shy or uncomfortable in expressing themselves, especially when it is not in their mother tongue.

Mentimeter leads to a greater degree of security and safety, while not removing the interactive and self-reflective part. Without the use of digital tools, the kind of transnational connection we were aiming for in the project would not have been possible to achieve. Keep in mind that also free and easy-to-use technology opens up opportunities for breaking down barriers that have hindered us in the past.

There are many other types of barriers that museums can aim to overcome, related to gender roles (male and female stereotypes), age (intergenerational meetings), ethnicity, religion, among others things. It has been emphasized in research that digital applications make it easier for museums to engage more proactively and quicker to social justice issues. The need for diversity, sustainability, participation, and being inclusive and accessible, are all essential to social justice, and are included in ICOM's (International Council of Museums) most recent museum definition from 2022.



Digital tools have expanded the possibilities for a much larger diversity of voices to be heard, providing an interactive platform where people can share their own experiences in real time, potentially to a global audience (Hancox 2021, 21; Giannini & Bowen 2019). This in turn, has reimagined storytelling towards greater inclusivity and towards the transmedial, meaning that stories are unfolding over multiple platforms where each part is providing a valuable and meaningful contribution to the overall story (Jenkins 2014; Hancox 2017). As written by Donna Hancox, museums can tap into this energy and by so doing, amplify under-represented and marginalized voices (Hancox 2021).

Thus, digital tools open up the possibility for museums to be more socially aware and attuned to the different needs in society as they are emerging. A heightened sensitivity to social media can help museums act quicker to societal challenges, rather than react when it might already be too late. One inspiring example of proactivity among museums is how the regional museums in Skåne and Lund University collected stories of arriving to Sweden as a refugee in 2015 and 2016, during the so-called refugee crisis. The museums also collected experiences from people who engaged voluntarily to help refugees with shelter, blankets, food, and other types of support. These stories were mostly collected and told through video interviews. It is a form of work that demands for museums to act quickly.



In order to stay attuned and be able to respond to emerging changes, digital tools will be essential.

Another barrier is that between what is conventionally considered “high” art and popular art. This barrier can make certain museum spaces feel exclusive rather than inclusive. Interestingly, digital development has made interdisciplinary art collaborations between musicians, artists, performers and technologists more common and participatory.

This provides opportunities for museums, as such collaborations tend to create artworks mixing several media which are challenging and moving beyond our traditional definitions of art, and thus not reducible to labels such as “high” art or popular art (Armstrong et al. 2018). By embracing these kinds of interdisciplinary collaborations, more inclusive spaces for art can be created.

● Expand by **moving behind the scenes**

Another barrier that the digital can help cross, is the possibility for letting people **move behind the scenes and experience the process of making exhibitions, pedagogical programs or conserving and curating objects**. This is a way of tearing down boundaries within the institution. Traditionally, these processes have most often been carried out behind the closed walls of the museum institution, while final and polished products, objects, exhibits, have been on display. However, there is a lot to gain in shifting perspectives in ways of sharing and engaging. The digital can help in that process.

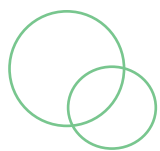
Firstly, allowing people to join the processes creates a sense of transparency to the workings of the museum (Bowen & Giannini 2019, 562). In turn, this can increase trust in the institution as a whole. Such transparency may be especially significant when dealing with sensitive objects with a large emotional and social value (Hicks 2020). Transparency will become increasingly significant in a future where it will be expected of museums to be held accountable for, and thus actively address and deal with, past crimes and injustices that shaped many museum collections, especially those with a colonial history. However, greater transparency is relevant in many other cases as well, as it can help build more sustainable relationships centered around trust. There is a sense of empowerment in being included in, and perhaps even having the opportunity to shape, the creative processes inside the museum.

Secondly, there is a large, and often untapped, learning potential in the very process of caring, curating and exhibiting at museums. This concerns for example the tending of objects and buildings, how to conserve in a way that does not damage, and how to practice traditional building techniques which are often more sustainable than modern ones. Many museums can also provide fantastic learning opportunities in storytelling; how to narrate the past so that it connects to the present and future in an engaging way. There is a great demand for these kinds of skills, and letting people see and contribute to such processes behind the scenes could be very valuable and meaningful.

Thirdly, there is a participatory and potentially empowering value in allowing people to follow and contribute to the processes of exhibiting the past and caring for heritage. Consider how you can let people join in a discussion on what objects will be exhibited, which stories do they tell and how can they be told? Further, research has shown that the processes of tending to heritage together with others can increase wellbeing and provide a socially meaningful context (Holtorf 2011).

Digital tools open up several possibilities to share and let people in behind the scenes, into the spaces where the general public is usually not allowed to enter. Short videos and reels shared on social media is a fast and immediate way to engage with an audience. There are also ways to create a more interactive engagement through free applications where people can express opinions, answer questions and help out in the process, by the use of digital white boards such as Padlet, Google Jamboard or Canva.

However, showcasing the inner workings of the museum, does not need to be only about sharing live experiences. By the use of XR it is possible to create an immersive experience revealing the often painstaking and considerate process of care and conservation that preceded an object or building looking like it does today. For example, XR tools can create an illusion of a specific building you are inside to be ruined or in a state of neglect while also revealing the work of restoring it through an immersive experience potentially including sounds and smells of construction and restoration. This can greatly enhance learning by revealing the unavoidably changing characteristics of heritage and the curating work involved in caring for sites and objects. However, this means that processes are carefully documented with videos, photos, (preferably including panoramic ones) and audio and video recordings with the purpose of sharing the experience. With such a material available, and by a thoughtful engagement with the five senses, immersive learning experiences can be created.



Critical thinking can be enhanced if the museum is open about the process behind why certain artifacts are exhibited (and not others) and why certain stories are told (and not other stories).

Digital tools can reveal the inherent silences that are present in each narration of the past, since each narrative holds that which could not be included (Trouillot 1995). After all, no story can take all perspectives into consideration. Often, these silences are not immediately understandable for a visitor, and it can be problematic when certain voices and perspectives are excluded. Digital tools can allow the visitor to engage with a much larger amount of objects from the collection, not possible to exhibit physically. Digital copies of objects can be available in 3D with high resolution, making it possible to zoom in, turn around and examine in detail. Informative texts or audio can be included narrating how the selection process took place, why the decisions were made not to include certain objects and perspectives, and who was involved in the process of making the decisions.

This will both build trust through a sense of transparency, as well as increase critical thinking on how pasts are narrated and the biases and silences involved in that process.



Reflect upon this!

- Are you letting people in “behind the scenes” at your museum?
- If so: what kind of processes at the museum have you been sharing and how?
- What processes have you not been sharing, and why?
- How have you been making these decisions?
- Think about the ongoing work at your museums and the internal processes that the audience never takes part in. Based on what was written above, do you see a value in sharing some of those processes?
- Which ones and what would be the value?
- How can you incorporate digital tools to help share them in an interactive way?

Example 1: The Transnational Time Travel

All of us participating in the project Digital Solutions for Applied Heritage - Exploring Transnational Learning Opportunities (DiSAH) carried out a joint transnational time travel in May 2023. We connected 164 eighth grade students in Estonia, Sweden and Finland through a set of interconnected events. It was the first time we have ever tried to do a transnational time travel event, so it required a long period of preparation and planning.



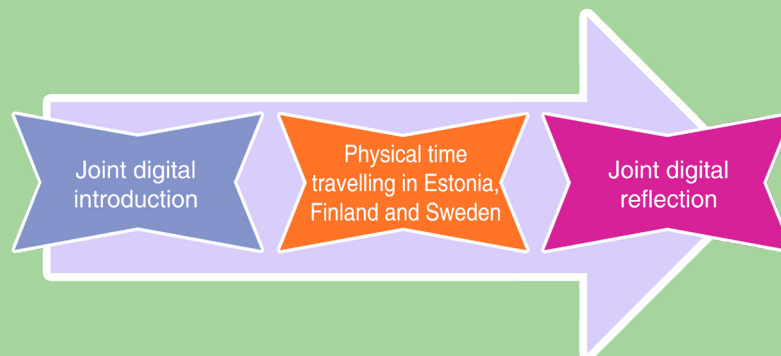
The goal was to use a form of transnational storytelling to move beyond the story of the nation and stimulate a learning that can build bridges across national boundaries. However, for a long period of the project we were not sure as to how to realize this in practice, but we knew that digital tools would be instrumental.

Then, in February 2022, Russia invaded Ukraine, and there was a terrible war raging in fairly close proximity to Sweden, Finland and Estonia that affected all three countries in different ways. Because of this very worrying development in Europe, we wanted to focus our own transnational time travel on the following questions:

- How is it to be a teenager when the world is on fire?
- What does home and belonging mean when in war or in crisis?
- What can you do, and what does it mean, to help others who are fleeing war or another difficult situation?

We decided to do it in a blended format where digital tools complemented and added layers and depth to the on-site events. The first event and the last event were online where all the pupils gathered in the digital space, while we organized on-site time travels in the respective countries in between the online events. The year we selected for the time travel event was 1944. We selected 1944 because World War II affected all three countries, but while Sweden never got attacked by Nazi Germany, wars on many fronts were being fought in Finland and Estonia.

This made links and comparisons between the three countries interesting to investigate. World War II also led to a widespread movement of people with both internal and external refugees in Finland and Estonia. It was therefore a suitable year to address the three themes above, and to draw relevant and critical connections to the present-day situation which could emphasize transnational values and connections.



The first event was online and was carried out from the studio at Jamtli, using the OBS-system (Open Broadcaster Software). OBS is a software to live stream and record content through for example YouTube, Facebook, TikTok, Twitch, Instagram, Teams, Zoom. It is compatible with most formats, and fits very well with digital storytelling, as it allows you to switch between and show different media formats in a much more seamless and integrated way than if you only use Teams or Zoom. Furthermore, it is Open Source and can be downloaded for free. We connected to the pupils in the three countries through Teams, and used OBS to switch between different media. In the first event we primarily used photos, films and Google Earth. After introducing the transnational time travel to all the students, we used Google Earth to zoom in and out of all the places where each school and museum were located. When we zoomed in on, for example Vaasa in Finland, the pupils sitting in Vasa were spotlighted and could wave towards the camera.

Thereafter followed on-site time travels. We decided to develop three different scenes that each class would experience in their respective countries. One scene went to Estonia (scene 1), one to Finland (scene 2) and one to Sweden (scene 3). All scenes addressed the three themes above, but were related to the specific situation in each respective country. Kalmar County Museum wrote the Swedish scenario, Estonian National Museum and Audentes School wrote the Estonian scenario, and BARK wrote the Finish scenario. Each scene takes approximately 30 minutes.

1



Photo: Estonian National Museum

Scene 1 takes place in Tallinn while the city was being occupied and heavily bombarded by Russia. Raid sirens are playing in the background. All the pupils are hiding in a bomb shelter. The actors have different roles - one is a communist, one is an opera singer who is also in the defense movement, one is a young man who wants to join the resistance in Finland. The pupils will have to make the difficult decision on whether they should stay in the country or not. And if they decide to leave, where should they go (maybe to Sweden?) and what should they bring with them to make a good life there? They are asked to prepare a suitcase for Sweden.

2



Photo: Museiverket, Collection "Historian kuvakokoelma"

Scene 2 takes place in a village in Ostrobothnia, in Finland. The country has just surrendered to Russia and according to the peace agreement Finland must give up a large portion of its land, Keralia, to the Soviet Union. Approximately 407,000 Karelians had to leave their homes during World War II and become refugees within their own country. They had to try to make a home in a new place with new neighbors. In this scene the actors take on different roles - a woman in the Lotta Svärd-organization (which was a voluntary auxiliary paramilitary organization for women), a wounded soldier and a Swedish journalist. The pupils are split into two groups, either as a Karelian refugee or a villager who is to welcome and help the refugees. The pupils will then focus on the following questions: how can we create a new life in this place? What do we need? How can we work together to create a place where we will all feel at home?

3



B 3275
Photo: Kalmar County Museum

Scene 3 takes place in Borgholm, Sweden, which was never invaded by Nazi Germany. The roles of the actors are an older student, a recruiter and a priest. In the start of the scene, the pupils gather outside a cinema and the older student is excited about an upcoming movie at the cinema. The festive spirit soon disappears when a recruiter and a priest arrive, asking the students to practice in a military camp in preparation for a possible war. The event focuses on the following questions: The world around us is on fire, can we really continue living as normal and enjoy our lives? What can and should we do from Sweden?

A few days after the three scenes in the respective countries, we all gathered online through the studio at Jamtli. This part was meant for all of us together to reflect upon the time travel in connection to our own lives today, specifically in relation to the war in Ukraine. We used the interactive software Mentimeter to ask questions to the students. The different steps of this part were carefully planned beforehand, which is especially important in a completely digital context.



Photo: Jamtli Studio by Gustav Wollentz

Some questions were fact oriented, some were related to choices and behavior, and some were related to feelings and thoughts. They were all addressing the three questions presented above: 1). How is it to be a teenager when the world is on fire? 2). What does home and belonging mean when in war or in crisis? 3). What can you do, and what does it mean, to help others who are fleeing war or another difficult situation?

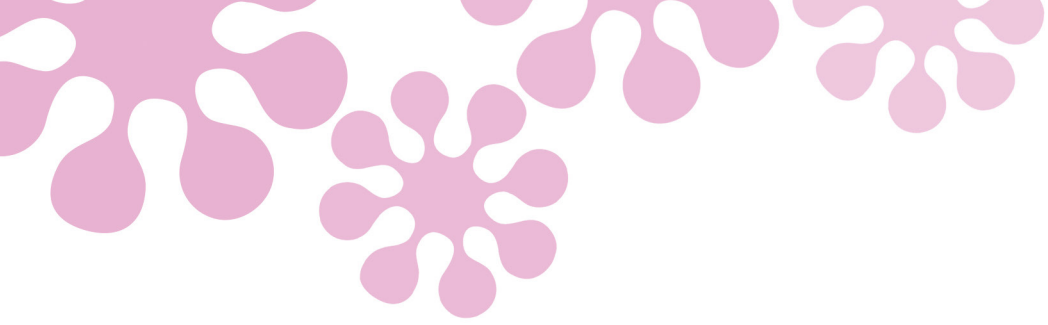
For example, we asked what they would be willing to do to help refugees and from what kind of news sources they learned about the war. We also provided time for discussions within each class room for the more challenging questions, recognizing that some of the pupils participating might have their own experiences of being on the run from a horrible situation.

The evaluation

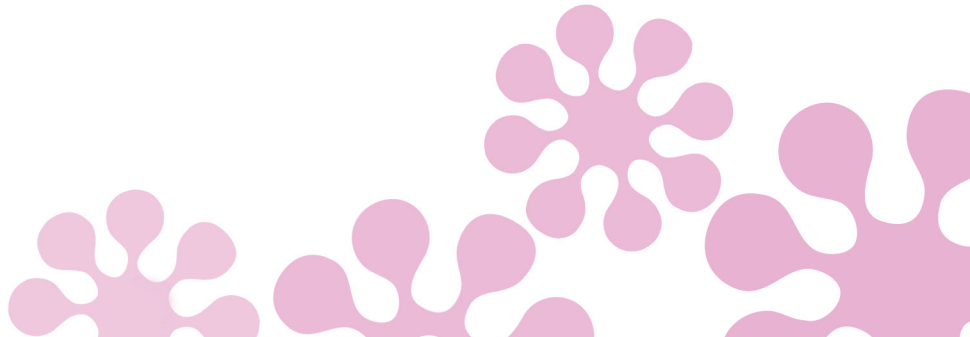
The evaluation informed us that the format succeeded in emphasizing transnational connections and relations. It made the students more aware of what is happening in other countries and how events in one country affects what happens in another.

Most students enjoyed the experience, and appreciated receiving a wider perspective than only from the country they live in. Some had never previously thought about how it was to be a refugee and being forced to leave your own country, so the time travel made them think in a new way. They also thought that the digital introduction and reflection with Google Earth and Mentimeter enriched the time travel and was engaging and fun.

However, a majority of the students did not feel very connected to the students in the other countries, maybe because they never had the chance to speak to them. They only saw each other and interacted through Mentimeter. Probably we could have created more forms of direct interaction, but it was challenging with more than 160 pupils joining and several different languages involved. We are currently within the project consortium exploring how to further develop the concept in the future.



Chapter Three



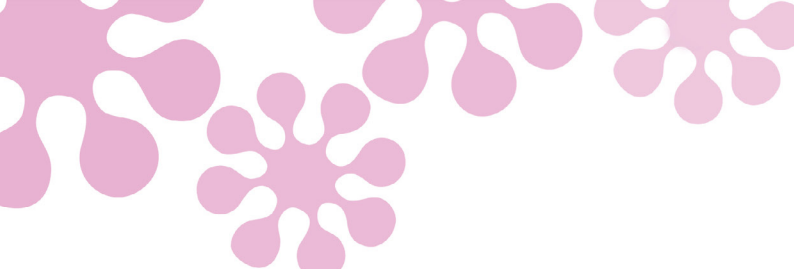
The meeting point between the digital and the physical

COVID-19 triggered a wave of digital development in the pedagogical work of museums based on a need to move online in order to reach audiences in times of lockdowns and restrictions. The activities were focused on fully remote and digital solutions, and were driven by a sense of urgency. But what happens now in the post-pandemic “new normal” stage? Both partners within the project and other museum professionals who we have talked to, have described a digital fatigue. Museum educators, teachers and students are sometimes tired of guided tours via Zoom or Teams, and they tend to express a desire to meet in person. There seems to be a worry about what the digital might mean for the future. How can museum educators navigate this uncertain landscape in the most productive and sustainable way?

A sense of digital fatigue is a result of the digital often becoming a forced - and too often an inferior - substitute to an on-site event during extended periods of lockdowns and social isolation. However, everything points to the digital arena and digital tools being here to stay, and that they will likely become more rather than less significant:

The rise of the millennial generation, often referred to as ‘digital natives’ due to their early and elevated usage of and familiarity with the digital world, points to the potentially sustained and rapid growth of digital experiences within the museum ecosystem. (Debono 2021, 160)

There is thus a need to lift the gaze beyond a current digital fatigue towards a future that has even been called postdigital, where there are no clear borders between the digital and the physical. Instead, they are both part of one seamless experience, and do not substitute or replace each other. We will explain what this means in this chapter, which is focused on the meeting points between the digital and the physical.



Increased accessibility is often the main driving force behind the digital work at a museum. The digital makes the expertise and knowledge of museum staff and the collections much more accessible, also for people who live far away from the museum. There has been a worry that digital accessibility challenges the authenticity of objects. However, it would be more accurate to say that the digital and the physical object tend to connect to different forms of values. As argued by Ole Marius Hylland: “An analogue original is valuable because it is authentic, while a digital copy is valuable because it is accessible.” (Hylland 2017, 80). In digitization, accessibility, rather than authenticity, becomes the main value of an object. This points to a new kind of role for cultural heritage institutions: as producers, guarantors and guardians of access (Hylland 2017, 80). It follows that the analogue and the digital provide values to objects in different ways.

In this chapter we will explore how the digital and the physical can blend and complement each other in each learning situation that we want to create. We will do this through the following points:

- **Elements of surprise, exploration and curiosity**
- **Creating safe spaces by digital means**
- **Following a chain of events**
- **Transmedia storytelling**

However, before we venture into these questions, it is important to explain what we mean when we say postdigital (Parry 2013). At its most basic, the postdigital can be defined as a seamless integration of the digital and the physical:


the boundaries between physical and digital, real and virtual blur becoming integral, the separation between people and institutions, inside and outside the walls becomes porous allowing for collaboration, partnerships and sharing. (Bowen & Giannini 2019, 561)

Nevertheless, what that can mean in practice is far from straightforward. It is worthwhile at this point to venture back to the previous chapter and think about Sandro Debonos five different scenarios for the future museum, and focus on scenario four, where the museum has found an equilibrium between the physical and digital, where it all becomes part of one experience.

This has been called the “phygital”. The digital and the physical do not substitute or replace each other in this museum. Instead, the very act of differentiating between digital and physical, and by so doing placing them in distinct boxes, becomes increasingly difficult and even counterproductive. But this is easier said than done, as we are so used to compartmentalized thinking. How do we move towards a more integrated approach? This will not only require new methods and ways of working, but also new ways of imagining the work at the museum.




Reflect upon this!

- 
- Is your museum most often making clear distinctions between digital and physical pedagogical activities?
 - If so: how are these distinctions usually being set and where are the lines drawn?
 - Can you notice any gray areas in between those lines?
 - If yes: have you carried out activities where this gray area has been the starting point?

● Elements of surprise, exploration and curiosity

Hybrid has become the most common term to designate an event or museum experience which is both physical and digital. Our survey suggested that hybrid solutions were more common in Estonian (50%) and Finnish (59%) museums than in Swedish (24%) museums. Most often, the use of hybrid solutions in the museum settings refers to activities where a physical event, such as a guided tour or a presentation, is also broadcasted online to Facebook or YouTube through Zoom or Teams. It mostly becomes a valuable way for people who live far from the museum to participate in the activity, and the target group is often broadly the general public, including adults and retired people, but also school children.



While this can be essential in order to reach out broader and increase accessibility, the digital substitute tends to become an inferior version of an on-site event, without any added value except the possibility to participate from far away. However, hybrid solutions can be much more than only making physical activities accessible online.

Even if less than 50% of the museums participating in the survey used hybrid solutions, there was a broad interest, especially in Sweden (Sweden: 89%, Estonia: 71%, Finland: 57%) in solutions that combined the digital and the physical. Based on the answers received, there is especially an interest in how combining digital and physical can create a more varied experience that spurs interactivity.

One way to approach the connection between digital and physical in a more integrated way, is to focus on the elements of surprise, exploration and curiosity. These elements tend to be interrelated and together they stimulate creative and oftentimes entertaining forms for learning. Surprise generates curiosity which in turn makes you want to explore and learn for yourself. Research has shown that a museums' digital presence will make people more, rather than less, inclined to visit the museum. If an object is available online, people tend to be curious to see how "the real thing" looks like as well. In such a way, a so-called "digital twin" (Matthys et al. 2021, 4) is not a substitute for the physical but creates a different kind of experience, value and relation.

The same is also true the other way around. Seeing a physical object will make people curious to digitally investigate it. This can be done through high resolution 3D photos where they can zoom in and out and turn the object around. It can also be done through Virtual Reality (VR), where people can hold and use the object. This can in turn increase learning on different topics such as object conservation, use-wear analysis (how objects are being used) and the history of the object in question. Instead of contributing to a form of "digital escapism" as Monika Stobiecka coined it (Stobiecka 2018), referring to how the digital can make visitors withdraw from the concrete matter of artifacts, a considerate blending of the digital and the physical can in fact make us better understand the very material dimensions of objects.

One example comes from the exhibition *Vikingarnas värld* (The World of the Vikings) at The Swedish History Museum in Stockholm, which was opened the 24th of June 2021. Many of the objects on display can also be experienced through high resolution 3D photos, where you can explore the objects in much more detail and from other angles than those on display.

This adds a sense of curiosity through the possibility of exploration by digital means. The fact that the object is physically on display in front of the visitor while he/she is exploring it digitally is adding to the overall experience. The digital and the physical complement each other and in combination contributes to a sense of curiosity through exploration.

When focusing on the act of exploration, it is not necessarily the most expensive or advanced digital solutions that are the most successful. That was noted by Stobiecka when visiting the exhibition “Treasures of Peru: The Royal Tomb at Castillo de Huarmey” at the State Ethnographic Museum in Warsaw in 2017, built around the search for QR codes. She describes the experience in the following way:

(...) the information was diverse and did not follow a predictable pattern of presentation. Visitors were encouraged to explore the material content of the room (search for (...) QR codes), as well as the digital content of the database. What could be a better means to show archaeology than to motivate the public to uncover artifacts and information? Even though QR technology is one of the simplest methods to provide digital content to tangible objects, curators proved that it could be used in an engaging way. Visitors, whether children or adults, were visibly enjoying the exhibit, wandering around the boxes, climbing the structure, and searching for codes that would tell them more about the objects. In this sense, I believe that (...) [this] room presented the essence of archaeology while effectively escaping from the typical digital display pattern in Poland [which is heavy with text]. (Stobiecka 2020, 315-317)

Surprise is more than simply learning or seeing something completely new; surprise can come from exploring and finding information, from creating things, from reaching a deepened understanding, or from being impressed and fascinated, among other things (Kairos Future 2020, 24). An unusual blending between digital and physical can create fascinating juxtapositions that can surprise and draw people in. When doing so, building upon a physically grounded sense of place can be beneficial. For example, through Augmented Reality (AR) it is possible to experience the landscape you stand in as being covered by snow by using an app on the phone, even though you are there on a sunny summer day with birds singing in the background. Another example is how AR can make it seem as if the building you stand in are in ruins, which can create a sense of change over time and enhance learning on restoration processes.

One example comes from how the Westphalian State Museum of Archeology in Herne, Germany, employs AR to create fascinating contrasts. Not only is the AR creating the experience of a forest while standing in the archaeological exhibition, it is also showcasing archaeological trenches below the feet of the visitors, revealing glimpses of the painstaking process of excavating the past. Creating an element of surprise through a deliberate juxtapositioning can be an effective way to capture genuine curiosity and interest in the story that is being told, which in turn will stimulate learning.

● **Creating safe spaces by digital means**

An important insight that came from the interviews we carried out, was how digital tools can be used to create safe spaces. This is true for youth who may feel shy or nervous in regular physical meetings, but comfortable and more confident in the digital space. As mentioned by one museum educator from Tartu University Museum:

I think the most effective result is when you combine digital things with real experience. (...) And to inspire this generation who are so used to digital things that it's their normal environment, and they don't want to speak up or open themselves in front of the public, but (...) maybe they can write [in the chat].

There can also be many reasons other than shyness or nervousness that makes the digital a safer space for some people. Another reason can be because of different forms of disabilities. As mentioned by one museum educator from Röhsska Museum of Design and Crafts:

It has a lot to do with accessibility, that people get the opportunity to be part of something they might not be able to be otherwise. To not physically be able to move from your home, for example. Museums, and other businesses and institutions, offer a digital conversation where you can participate live, and comment from the place where you are, where you might feel safe because you do not want or cannot leave the place where you are safe or don't have the opportunity.

Furthermore, a sense of unsafety or insecurity at the museum can also be because of a lack of knowledge or trust in the museum institution. For those who are used to facing discrimination within their everyday lives, the museum institutions may not immediately come across as a place of belonging and safety (Smith 2020). This demands a sensitivity when selecting suitable tools for reaching out, a point which we will return to in Chapter four on the topic of co-creation. What is significant to highlight here is that you as a museum professional may on occasion need to adapt to, and use, digital tools that those you want to reach out to are comfortable with, even if it may require venturing outside of your own comfort zones. Sometimes you need to engage with people on their own terms to build trust. A smart use of digital tools can also make more people actively participate in reflections and sharing opinions. Here, the use of anonymous interactive tools such as Mentimeter or Kahoot can help in creating a sense of safety and security.

By making people familiar with the workings of the museum by creating a safe space using digital means, the chances are increasing that also the physical museum building may feel like a safer and more welcoming space. In the long-term, it can make people visit the physical museum who otherwise would never have visited. As we come back to repeatedly throughout this chapter, the digital and the physical complement and build upon each other; if the museum creates a safe digital space where everyone feels welcome, it will also make the physical museum space feel safer.

● Following a chain of events

One of the main benefits of digital tools is the possibility to employ them in order to follow a whole chain of events. In such a way, digital tools can extend the experience in time, to a before, an after and an ongoing/not time-limited (Kairos Future 2020, 33). This can for example be in order to set the scene prior to an on-site event and offer possibilities for a deeper and more transmedial experience. This was the ambition of Kalmar County Museum (KCM) when they developed a digital platform for teachers and students that provided forms of material including interactive digital games to be used prior to an on-site time travel. The purpose of the platform is to add value, depth and increase participants' confidence in the time travel in a fun and interactive way - not to substitute or replace it.

The important lesson from KCM in this context is that the material provided prior to an on-site activity does not need to be reduced to solely text-based information presented on a home page, as we may traditionally conceive of when thinking about digital databases, but can potentially be equally fun, engaging and interactive as the on-site time travel, but in a different way. KCM achieved this by using 360 photographs and an application for digital place-based storytelling called StoryMap, which is using the Geographic Information System ArcGIS (see Example 2).

Our interviews reveal that before COVID-19, museums were largely trusting teachers to prepare pupils with material and background information, with varied results depending on the specific workload and interest of the teacher. By digital means, the museum can now be active in the preparation phase and make sure that the pupils come to the museum with background information, questions to answer or specific tasks to carry out. The initial phase can also be important to determine what kind of expectations there are of an event, which can be useful to adjust the expectations accordingly but also to learn from them. Furthermore, if there are very low expectations, this phase can serve to increase interest and curiosity (Kairos Future 2020, 33).

Following a chain of events includes the possibility to follow up after an activity, through evaluations and reflection connected to what kind of learning outcomes occurred, also on a more long-term basis. In such a way, it improves the chances of learning from the experience and thus develop better pedagogical programs in the future. Here, digital platforms for evaluation can prove vital, such as Crowdsignal. In the long-term, the possibility of following a whole chain of events, that is, to extend the experience in time, is important to build more sustainable and lasting relationships to the museum. This will potentially make the learning effects last longer.

If you want to maintain contact with a group in a more meaningful way, forms for a more continuous exchange will be needed that do not necessarily have a set beginning and an ending. Indeed, when blending physical and digital it is not always necessary to think of a pedagogical program in terms such as before, during and after. All parts, digital, physical, hybrid or blended, action-oriented or reflective, can be equally important for the whole experience. There can be more than one point of entry and more than one exit to the chain of events, which forms the basis of what has been referred to as transmedia storytelling (Hancox 2021).


● Transmedia storytelling

Transmedia storytelling is a more non-linear form of storytelling that has become increasingly common during the last 20 years. It signifies stories that are unfolding over many platforms and media. There may be multiple points of entry to the story and multiple endings, and importantly, no matter the point of entry, each part is providing a valuable and meaningful contribution to the overall story, whether the media is digital, analogue or blended/hybrid (Jenkins 2014; Hancox 2017). This is a form of storytelling that the public, including visitors to the museum, are becoming more and more accustomed to. It is most associated with major blockbuster franchises such as Star Wars, Marvel and Harry Potter, which are told through books, movies, toys, comics, and even by the fans themselves. However, transmedia storytelling is much more than Hollywood blockbusters. A similar type of logic as in transmedia storytelling has been present long before digital media entered. Consider for example how the story of the nation was built in the 19th century through combining several media: symbols (such as a flag), songs, newspapers, books, dances, clothes and more (Grinell 2022).

Transmedia storytelling also provides a major opportunity to tell stories from the bottom-up by letting more voices be heard on their own terms. Donna Hancox has argued that there is a mostly untapped potential in transmedia storytelling to be used for social justice and human rights. This is because transmedia storytelling is based on a decentralized concept of authorship, meaning that it does not “privilege one voice, one part of the story or one platform over another.” (Hancox 2021, 3) Furthermore, a physical sense of “place” can also be of significance in transmedia storytelling, such as a region, city or neighborhood. However, it provides a way to tell the story of a place based on multiple experiences and perspectives, e.g. in a way that can be called “plurivocal”.

Transmedia storytelling can be highly useful for museums to navigate a postdigital future for two important reasons.

1. It focuses on how the visitor can be part of and contribute to the story in different ways. Instead of starting by focusing on the media (which tools and platforms will we use) the point of entry will be: how can we work with different media to make people develop their own relations to this theme or place (Grinell 2022)? How can we make people be part of telling the story?



2. Transmedia storytelling is by its definition built upon a seamless switching between different media, where hierarchies between different forms of media are flattened and where each part is contributing in a unique way to the overarching story. It is thus a form of storytelling perfectly attuned to a postdigital era, where people can enter, experience and exit the museum through many different forms and media.

It is likely that your museum is already to some extent telling transmedial stories without necessarily reflecting upon them as such, and perhaps also without tapping into their full potential as a vehicle for empowerment. It is therefore worthwhile to consider the following questions:



- Do you have any stories at your museum which can be called transmedial - even if you have not thought about them in those terms before?
- Why are they transmedial? Which different forms of media are being used?
- Can you think of ways to allow for people to actively contribute and be part of the transmedial story?
- How can stories of visitors and users add a meaningful contribution to the overarching story?
- What kind of additional media may be needed for this to happen?



Reflect upon this!

Example 2: Kalmar County Museum's development of digital platforms

Within the project Digital Solutions for Applied Heritage, Kalmar County Museum (KCM) aimed to use digital tools to improve their pedagogical time travels and especially use digital tools to increase the possibility of participation and co-creation for pupils. To achieve this, KCM used digital tools to build a more reciprocal relationship with teachers and pupils. In the past, KCM often developed training for teachers on how to work with time traveling methods. However, due to an increased workload for teachers, this is no longer possible. Instead, KCM produced digital material for both teachers and pupils available online through digital platforms.

The digital platforms are a form of toolkit including different useful material. These platforms are a complement to on-site time travels, and do not substitute them. The digital platform for teachers has the purpose to inform the teachers of the time travel methodology, how to practically conduct a physical time travel, and what is needed in order to prepare and continue working with the insights after the time travel. This is related to before, during and after an on-site activity, e.g. how to follow a chain of events. The hope is that the material will make teachers more comfortable as well as increase the possibility for them to relate the time travel to the curriculum at school.




The purpose of the digital content for pupils is to increase confidence in the pupils prior to an on-site time travel. This is based on the realization that the more confident the pupils are, the more participatory and co-creative they will be during the event. A time travel event involves making difficult decisions and playing the role in various possible ways to be part of forming the story. In other words, the platform is intended to create better conditions for co-creation during an on-site time travel. Four different interactive games were created related to four different places in Kalmar County, that can be experienced and explored without moving outside of the classroom.


Photo: Kalmar County Museum

KCM only used resources existing at the museum: StoryMap which is an interactive application for digital storytelling through GIS-based maps, 360 photography, videos and editing software. It is worth mentioning that the only essential components were the 360 photography and the editing software. StoryMap requires the museum to have access to ArcGIS, commonly used by archaeologists, and it was used to upload the material. However, it is also possible to use other services that serve the same purpose. Overall, the technology did not require expensive resources or advanced digital skills. Through 360 photographs and videos, interactive games were created where pupils could enter and explore houses and objects in the rooms, meet people, ask questions and make decisions that would affect what happens next. The digital part is a complement to an on-site time travel which will occur later. It introduces the theme and perspectives upon the time period. The digital and the physical walk hand in hand, with the overall purpose to stimulate a sense that there are choices to be made, and that these choices make a difference.

There are a few lessons to learn from these experiences:




Digital platforms can be used to **increase confidence** among teachers and pupils, which in turn can help enhance participation and co-creativity.




When working towards teachers, it is helpful to continuously **make clear links** to the curriculum in the digital platform.



There is a value in making digital preparation material fun and interactive by **implementing elements of gamification**.



Elements of gamification do **not necessarily require expensive licenses or equipment**. All that was used in this case was a camera for 360 photography, an editing software and an app for digital storytelling, StoryMap, the latter not being essential for the experience.



While it did not demand advanced technological resources or skills from the museum, **sufficient time for piloting and experimentation was essential** in order to come up with new approaches, methods and ways of working.



Chapter Four



The digital as a resource to achieve co-creation in practice

How can museums make co-creation into an experience which is transformative?

It becomes more and more common to hear co-creation as an expected goal of a pedagogical project or program. Sometimes elements of co-creation can even be a requirement to receive funding for a pedagogical project because it is often prioritized on national and EU-levels. For some, co-creation may seem like a trendy buzzword that will fade away quickly. For others, it may be seen as an opportunity to make real change and affect people in profound ways. Then there are those standing on a hesitant distance, not yet determined on what co-creation can mean and how it can contribute. Perhaps you belong in one of those three categories?

Research on the future environment of heritage is indicating that the future will be more co-creative (Heritage, Iwasaki & Wollentz 2023). It does not seem to be a temporary buzzword. Building capacities now for a more informed and committed engagement in co-creative practices will thereby likely increase the long-term resilience and relevance of your museum to tackle societal challenges.

Our survey and interviews show that museums are not using digital tools for co-creation nearly as much as they possibly could. Many interviewees are saying that they wish they could work more co-creatively but are lacking the time, skills and resources needed. Furthermore, some interviewees seem to realize during the interview that they need to work more co-creatively. In this chapter we will explore how digital tools can be a resource in that process.

Moving towards a common concept and a joint strategy

Co-creation is a concept that many museum educators already today somehow must relate to in their practice. However, our interviews indicate that co-creation is often approached in different ways among museum professionals. In other words: a shared understanding of what co-creation means in practice seems to be lacking. This tends to make co-creation an elusive and difficult concept to apply, and where misunderstandings frequently occur.

If you are not able to identify common goals in co-creation, *together with the partners you are working with*, the process can become tense, unfocused, and frustrating. Further, there is much uncertainty as to how digital tools can assist in co-creative practice. In this chapter, we aim to highlight ways for the museum to fill the word co-creation with value by the use of digital tools, in order to build a joint understanding and a meaningful path forward.

We think digital tools provide a fantastic resource for realizing co-creation in practice. For this to be achieved, museums may need to reconsider their approach to the values in engaging in co-creation, towards processes of building relationships. Below, we will highlight what we mean by this, but first we need to discuss co-creation itself.

Make clear what co-creation is for you, and what you do not mean with co-creation.

We do not suggest that there is only one correct way to understand co-creation and that we hold the definitive answer. On the contrary, within research and depending on which discipline you adhere to, co-creation will be understood differently. Perhaps one reason for this is that the term co-creation and the ideas it builds upon originated in the 1970s within a workplace context. Initially, it meant that the expertise of workers and consumers was included in the design of new products, which empowered workers and resulted in better products (Holdgaard & Klastrup 2014). Subsequently, the term has gained traction within the museum world and other sectors, in the purpose of increasing participation and social cohesion. We do not hold the blueprint for co-creation. Nevertheless, it is crucial that there is a joint understanding when using the term, especially when working as a team. Always be as clear as possible with the term because co-creation is not self-explanatory.



- When you say co-creation next time, take some time to reflect upon why, how and in which context you use the word.

- Do you think the person/people you speak to understand it in the same way? Maybe you can ask the person(s)?

- Are you working with co-creation in your team? Can you explore the varied understandings of co-creation within your working group?

- Perhaps you can even find a shared point of entry to the concept and how you want to work with it?

Reflect upon this!



As highlighted above, clarity is of essence. Therefore, we need to be clear with how we use the concept in this book. Perhaps a good starting point is to look at what we do not think co-creation is.

We do not think it is the same as collaborating. Instead, we think co-creation is about *building partnerships* on more equal terms (Simon 2010).

We do not think co-creating is the same as involving people in the process. Instead, we think co-creation is about *establishing a sense of trust* through joint ownership of the narrative and the process.

For us, co-creativity is about distributing power more equally, and in such a way, being able to let go of some of that control. Co-creativity is about sharing, listening, and creating together. Ideally, any possible results should be co-owned and shared. Ideally, co-creation involves every stage of the process, from planning to implementation (Simon 2010).

If your museum organization is initiating the co-creative process, the museum will have to set some boundaries, but the boundaries cannot be so tightly set that there is no sense of ownership or control of the process among those joining. In co-creation it is not necessary to make a distinction between correct and wrong ways of interacting. Instead, there must be a structure that allows for different ways to participate, including ways you were not expecting or planning for. This also includes allowing for types of interaction that are challenging and critical against the very structure that has been set (Harper 2020).

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- What boundaries would work for your organization?
 - How can you set those boundaries in a way that does not diminish a sense of control and power?
 - Do these boundaries allow for different types of participation, including ways you are not imagining or expecting?
 - What do you feel comfortable about in co-creation and why?
 - What makes you feel uncomfortable and why?
 - Could the uncomfortable feeling be a sign that you may be heading in new, innovative and unexplored directions?

Co-creativity may force you to do and think differently, and may even require your museum to change established patterns and structures. Are you used to always being in control? Then this will challenge yourself into a new way of working. Do you like the creativity that can spur from the unplanned and the unexpected? Then co-creativity is a way to tap into that creativity.

Without establishing trust you cannot engage in co-creation. However, trust must be established in both or even in multiple directions depending on how many partners you engage with, and it demands time and care. Building trust is the key in co-creation, and digital tools can help in that.

In the next part of this chapter, we will turn more directly towards how you as a museum professional can approach the digital to achieve co-creation. We will do this through a set of important points to consider:

- **The museum as a facilitator**
- **The need of finding balance between care and time**
- **The value in the process**
- **The art of selecting tools**

● **The museum as a facilitator**

We mentioned earlier that co-creation through digital means may require us to shift perspectives and find new ways of doing things. It is now time to reorient our perspectives and by doing so, perhaps find a different angle than the one we are used to. Let us think of the museum less as a conveyer of knowledge that goes in one direction, and more as a facilitator of connecting people through stories, including people who would otherwise never have met and shared experiences.

Museums have always been telling stories through objects, and these stories can connect and create bonds between people. It happens all the time. Furthermore, museums are social spaces, and they are also appreciated because of their social dimensions (Falk & Dierking 2018; Wollentz et al. 2021, 2022). We all carry stories, but not everyone has the possibility to make their stories heard (Jackson 2013; Hancox 2020). Museums can facilitate the space where previously unheard stories can be listened to.

This perspective does not mean that knowledge in the traditional sense is unimportant for the museum. On the contrary, facilitation is a way to recognize and pay attention to different forms of knowledge.

Within the role of the museum as facilitator, the digital is a tool for creating meaningful connections where knowledge can go in multiple directions. Here, museums are not so much about conveying knowledge, as it is connecting different forms of knowledge, finding links across time and space. Indeed, there are many benefits in actively using digital tools for the purpose of facilitation.

As mentioned in Chapter three, digital tools can help you flexibly move across many different times and spaces, and switch formats and points of entry in a seamless way through for example transmedia storytelling. When being a facilitator, it is crucial to allow for different ways of interacting and sharing stories.

The digital allows you to share stories in many ways beyond only verbal communication. You can share your stories through photos, drawings, audio and video recordings, body movement traced through motion capture technology, words written in a chat or a message board, shared VR experiences, social media, or through interactive tools such as Mentimeter. The digital allows for a multitude of ways to interact and share stories, which can open up for a less hierarchical form of facilitation.

Not least, digital tools can extend the experience in time, to build more long-lasting relationships through dialogue and exchange. In this role, listening to stories becomes equally important as telling stories. Especially when those stories are coming from groups who usually do not find themselves at the museum. We are all learning from each other.


This possible shift in perspectives and ways of doing forms a very good starting point for co-creative engagement through digital tools.



Now consider a few minutes the way you use digital tools at your museum in the purpose of facilitating meetings:



Reflect upon this!

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- Have you been using digital tools to facilitate the exchange and transfer of knowledge in multiple directions, where there are no clear boundaries between who is an expert and who is learner?
 - Have you been using digital tools to connect people who may not otherwise have met?
 - If you say yes to any of the above: How did the digital tools help in the process? What can be improved? If you have not, this could be a good opportunity to try.

● Finding balance between care and time

We mentioned above that time and care are essential in co-creation. These are two keywords, and they are intricately connected. Imagine how it would be possible to show care and affection to someone without time for it? In addition, the care you show to someone you love does not have a start date nor an end date.

Instead, it is ongoing and regularly shown through acts of care. If it is perceived to be limited in time – for instance bound to the duration of a project - people may be left feeling that it is not genuine (Wollentz & Kuhlefeldt 2021). In other words: **time is needed for care to be established and maintained**. This is an issue of prioritization, where allocating sufficient time for building relationships must be included in overall planning and strategy development at the museum.



The museums interviewed which seem to have come furthest in terms of achieving co-creation in practice, are the ones where such work is prioritized within strategic documents and visions. This makes it easier to allocate the time and resources needed for building the essential relationships for co-creation to occur. Furthermore, they have also succeeded in finding channels and structures in maintaining regular and sustainable contact with a target group.

Digital tools are not providing additional time for the museum. No matter how much and how innovatively you use digital tools, sufficient time for relationship building will always need to be prioritized and allocated. There are no quick fixes for building durable and meaningful relationships. However, digital tools provide a valuable and efficient resource to maintain an ongoing relationship on a more regular basis, which can make it possible to develop a deeper and more respectful relationship. The digital can allow for a form of flexibility and adaptation that can be seen as a sign of respect and understanding. Of course, digital exchange can be complemented with on-site meetings.

Such a use of digital resources would not require expensive licenses or equipment as tools for digital communication and interaction, such as Zoom and Teams are available for free. Nor do they require advanced digital skills as most of us probably use at least Zoom or Teams in our professional as well as personal lives.

Perhaps your own personal experiences with digital tools can provide some inspiration for the museum you work at?

● The value in the process

The previous section highlighted the need to prioritize time for building relationships of care. By doing so, another necessary shift in perspectives, mind sets, and ways of working can be possible. Through the interviews we conducted it becomes clear that museums are often focused upon developing a finished product when engaged in co-creation - a polished end-result - rather than on the process itself.

What we mean is that co-creation is often seen as a method to produce better, more relevant, and inclusive content, be it an exhibition or a pedagogical activity. This is likely true. Co-creation will make your work more attuned to the needs and interests of those you want to reach. However, the idea of what co-creation is and can do needs to broaden beyond gathering feedback and involving people to produce content, towards building trust, increasing confidence and empowerment, and finding sustainable structures for long-term relationships to form.

Every time you engage in co-creation, you do not necessarily need to forge new long-term relationships to the museum. Each situation is different, and ambitions need to vary depending on resources and what is possible to achieve. However, it is important to always try to lift the gaze from the “here and now” towards the long-term perspective. Within such a shift, processes rather than products can be seen as significant results, related to important societal challenges such as alienation, integration, wellbeing, and loneliness (Wollentz & Kuhlefeldt 2021).

Co-creation is especially challenging to achieve when aiming to reach disadvantaged or marginalized groups, as they tend to hold less trust in public institutions. Here, building a sense of genuine care becomes even more important. Paying more attention to the acts of building these vital connections centred around a sense of trust and confidence, and less attention to producing a specific tangible outcome, would increase the chances of making the process of co-creation more meaningful, participatory, and sustainable for everyone involved. It would most likely even produce better end-results.

Researchers Jonathan P. Bowen and Tula Giannini have written that the rapid development of digital tools in the museum world will demand an institutional change, towards increased usage of participatory and interactive models. There is thus a direct connection between co-creation and digital development:

With this [changed] institutional state of being comes new awareness and the ability to respond to social and cultural issues and movements, and most importantly, to adopt participatory and interactive models of a working community, insuring that public voices are heard and play a role in the life of the museum. (Bowen & Giannini 2019, 561)



- What steps can you take now for your institution to increase its focus on practices of building relationships?
- Can you identify any current practices that would need to change, for this to be possible?
- Do you think digital tools can help you maintain a more long-term and sustainable engagement with a target group? How?


● The art of selecting which tools to use

In this section we will discuss how to select digital tools for co-creation. Perhaps you are curious as to what constitutes "suitable" and "unsuitable" digital tools for co-creation? We would answer that the question may need to be posed in a different way. Co-creation is about engaging with people on their own terms. In a study examining the future environment of technology and opportunities for innovation and experimentation in the UK, the Arts Council England concluded:

The growth in 'everyday creativity', and in particular voluntary participatory arts, digital activity amongst the young and the rediscovery of craft and making may create opportunities for arts and cultural organisations to meet audiences and participants on their own terms. (Armstrong et al. 2018, 7)

Instead of starting an activity by selecting which digital tool to use, it is worthwhile to consider what kind of learning and participation you want to achieve. Digital is not a goal in itself but a tool to achieve certain goals. However, we have found that many activities start at the wrong end: with the tool rather than the purpose. If co-creation and participation is a desired goal, then consider which tools that the group you want to reach out to is using. Perhaps it is not even necessary to determine the tools before the activity starts? **Selecting suitable tools can be a valuable part of the co-creative process.**





The following values are often highlighted when co-creation is discussed: respect, trust, communication, and commitment (Kroning 2017, 4). Communication is essential, and here digital tools can prove vital. However, respect and trust can only be achieved if the partners you work with feel safe and comfortable. The digital tools some of us are comfortable in using may be uncomfortable for others, and vice versa. This requires a large degree of sensitivity.

Our survey and interviews show that museums are already very present on, and comfortable with using, Facebook as a platform for communication and exchange. One inspiring example in our survey comes from The Swedish Museum of Natural History (*Naturhistoriska riksmuseet*) and their ongoing work with teachers. They have created an active Facebook group for teachers, which is open only to members. As of now (March 2023), the group has approximately 4800 members. The requirement for joining is to either be a teacher or studying to become a teacher.

Through this Facebook group the museum manages to have regular contact with teachers, who can also pilot and test pedagogical programs and material. This has become especially important in developing digital Escape rooms for school children related to the curriculum. The museum always finds teachers who can test material for grade 1 to 6, but it is more difficult for grade 7 to 8 as well as for *Gymnasium* (high school). The teachers for the older pupils are less flexible when it comes to schedule, time, and curriculum. They have fewer possibilities to add extra elements to the education – at least in a Swedish context. The Swedish Museum of Natural History is emphasizing that the workload and limited time for teachers is the main challenge, and therefore, that it becomes essential to have a large amount of respect and be adaptable. Here, the use of Facebook has become vital.

Facebook is an excellent platform for regular contact with teachers, as many teachers are active on Facebook - however, far from all. Nevertheless, Facebook would not be suitable when trying to reach and be in contact with youth, as they are seldom active or even present on Facebook. Our survey showcases that museums are seldom present on the digital channels where young people are active, and our interviews indicate that most museums lack the necessary knowledge on these applications to feel comfortable in using them. Here, there is a discrepancy that needs to be overcome. Social platforms built around short reels/videos, such as TikTok and Snapchat, are popular among youth in 2023. However, very few museums have started using such platforms, as they are unfamiliar with them, and unsure on how to use them in a constructive and meaningful way.

One interesting example comes from the Postal Museum in Finland, who are planning to engage with young people, together with other museums in the city of Tampere, through the platform Discord, commonly used for interaction during gaming. The idea is to use a Discord channel, which is already established and used by young people, to co-produce a digital exhibition about communication today, focusing on issues such as how and why do we communicate in contemporary times, and do we communicate things without even realizing it? Using Discord makes the process of co-creativity easier, as mentioned by one employee at the Postal Museum:

First [we will have the] exhibition in Discord – then hopefully go public on for example Instagram. I would like to talk with the youngsters where they would like to see museums, where they would like to publish the exhibition. The idea is also to find new avenues for doing digital museum work (...). Going to a place where the audience already is and using a Discord which is already used makes a lot more sense.

Another inspiring example is how The Swedish National Heritage Board engages with young people through letting them co-create heritage environments within the popular game Minecraft, in which artificial worlds are built, transformed and explored.³ For a more sustainable co-creativity to occur, finding suitable channels of interaction and communication are essential. Here, museums may very well have to dare venture outside of their own comfort zones and try new platforms and ways of engagement. The ability to dare to be experimental and try new platforms for outreach is a capability that probably needs to be higher prioritized when developing digital strategies and when hiring personnel at the museum.



- Are there any digital platforms or tools that make you feel uncomfortable or uncertain?
- What do you base this feeling on?
- Have you ever tried using them? What experience with them do you have?
- Do you think they can be suitable for you to engage with a new type of target group that you normally do not reach? Which target groups?



3 <https://www.raa.se/2022/03/medeltidsborgen-glimmingehus-fick-nytt-liv-i-aventyrsspelet-minecraft/>

Example 3: Jamtli's work with OBS

If you want to expand on how to interact by digital means, why not receive inspiration and learn from how influencers and YouTubers use digital tools on a daily basis?



Photo: Malin and Magnus at Jamtli studio by Gustav Wollentz

That is what the regional museum of Jämtland, Jamtli, did when COVID-19 initially forced the museum to develop completely digital content in 2020. By studying hours of content on TikTok, YouTube and other popular social platforms - and learning from how influencers use digital tools - Jamtli chose to work with the free open source software OBS (Open Broadcaster Software). OBS is very popular among influencers to live stream and record content as it is free and offers a large variety of functions. Furthermore, it can be used on most operating systems and can easily stream videos to popular sites such as YouTube, Facebook, TikTok, Twitch and Instagram. It is a more integrated and interactive platform than Zoom or Teams, as it allows you to switch between and show different media formats in a seamless way.

While it is one of the most common broadcasting tools for social media influencers, only two museums in our survey had used it, both located in Estonia. Museums seldom seem to be aware of what OBS is and what it can do. Jamtli got to know about it by venturing outside of its own comfort zones and into the world of influencers; into the world of unfiltered content where chronologies are jumbled and the banal and the profound often coexist.

Jamtli achieved a greater understanding on how young people produce, take in, and appreciate, digital content, which could help inform their own activities and focus. This was a very rewarding experience for the museum, and they find that they are now often able to positively surprise young people with their digital content.

However, to enhance the user experience, OBS benefits from a studio, preferably with multiple screens and cameras, where different softwares can be combined. Furthermore, it will demand some training to use it effectively. While the software is intuitive and can be learned fairly quickly, Jamtli's experience emphasizes the need for allocating sufficient time and resources for digital development, underlining how digital outreach and pedagogy have to be prioritized at the museum.

Example 4: BARK's engagement with co-creativity

The Ostrobothnian Children's Culture Network BARK initiated a co-creative process in 2022 and 2023 as part of the Digital Solutions for Applied Heritage project. This work was blended as it connected both online and on-site activities throughout the whole process. The aim was to stimulate a process where pupils from several schools could be part of co-creating a time travel based on the local history of the communities where the pupils were living. BARK involved three 8th grade classes in three different schools in Ostrobothnia, Finland. The contact with the students started with a completely digital meeting through Teams where the three different classes could connect and where the purpose of the work was set out. The students received the assignment to conduct their own research on what happened in their local community during the year 1944, when World War II was still going on. The students could conduct this research in different ways. They could go to archives, libraries and museums and they could conduct interviews with people who experienced that year (for example grandparents or other relatives). Students received one and a half months to conduct their own research and then present their findings in the way they themselves choose to, having the possibility to select between three options: PowerPoint, a video and a TikTok reel. This was a new way of working for many of the teachers, who were especially unused to presentations in the form of TikTok reels. However, the key was to always focus on the process rather than on the produced videos, TikTok reels or PowerPoints. By placing emphasis on the process, the teachers became more comfortable with the different educational forms to present the findings.

The process started in each school with an educator from BARK presenting the task on a local level and presenting possible material and places to search. Students interviewed relatives and friends of relatives. They were prepared beforehand on how to handle the situation if difficult emotions came to the forefront, and were ready to skip questions and stop interviews if it became sensitive for the person who was interviewed. Students got involved in trying to find people to interview, and in some cases they had conversations with relatives in a way they never had before, learning and understanding new things about their lives. The students also went to archives and libraries to find material and newspapers from 1944. Here, both the archives and libraries had prepared material beforehand from 1944, that the students could go through and explore. In one of the communities, the local museums had many objects from the 1940s, and the pupils visited the museum and looked at and interacted with the objects.

The students could also search the digitized material online. It was important that the archives, with guidance from the teachers and BARK, prepared some material beforehand, especially from 1944 newspapers, and helped the students in the process. The teachers had a central role in keeping the task at the right level as well as encouraging the students in the process. Otherwise, the task would have been too time-consuming and challenging. The students learned a lot in visiting an archive and going through, and understanding, material from 1944.



Photo: Margita Engelholm.

After one and a half month all the three classes met online again through Teams, and presented their findings for each other - either through TikTok reels, videos or PowerPoint. They also had the chance to discuss the whole process together. Afterwards, BARK took the material and used it to produce a scenario for a physical time travel to 1944 using the local history from the places that the students had researched. Two time travels were carried out with the students during May 2023. It was rewarding for the students to play in a time travel they had themselves contributed to shaping.


The students became very engaged in the process of researching about 1944, going to the archives, finding material and interviewing relatives. They also became involved in what kind of music would fit the video or TikTok reel and investigated suitable music from 1944. They enjoyed the freedom of being able to present it in different ways, including ways some of them are more comfortable with, such as through TikTok reels, which are uncommon within the school classroom. Further, there was a sense of co-creativity in later being able to play in a time travel they had contributed to do research and content for.




Photo: Annina Ylikoski.

It created a sense of ownership to the story that was being told. On the downside, it is a much more time consuming way of working for both heritage educators and teachers. Furthermore, teachers can get uncertain when working in this way with heritage institutions, as it is uncommon. This makes it very important to be clear with what is expected of both the teachers and the students.


Here are some key observations from this activity for those who would like to do something similar:




- Find ways for the students to present the material in formats they are more comfortable with. A formal PowerPoint presentation might be suitable for some, while a recorded TikTok reel works better for others. Allow for a range of options to select from, applying different digital tools. If the student is not good at writing, then presenting the findings with pictures and a voiceover in a video worked just as well.




- Allow for different ways and approaches to engage in co-creative work. Here, the students visited archives, museums, libraries and conducted interviews. Both digital and analogue material were being used.




- Assist the students in the process so that they have the necessary tools, resources and knowledge. In this case, suitable material was carefully prepared beforehand with the archives involved.



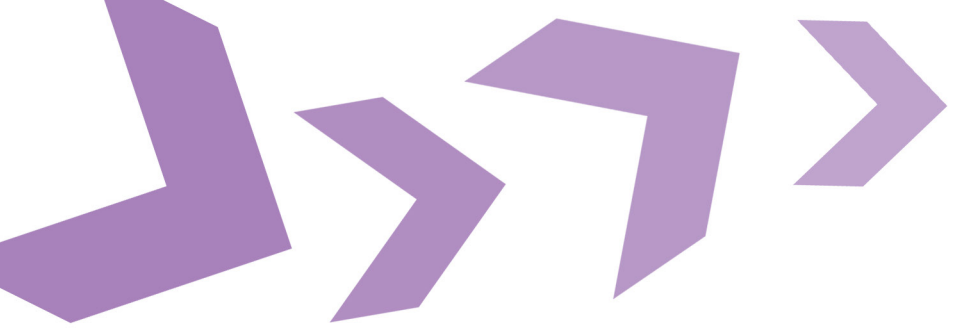
- A clear frame for co-creation was set beforehand. This includes a theme (local history in 1944) and a range of methods and presentation options. However, the frame was loose enough for the students to still feel a sense of exploration and to develop an individual commitment to engage in the activity in their own way.



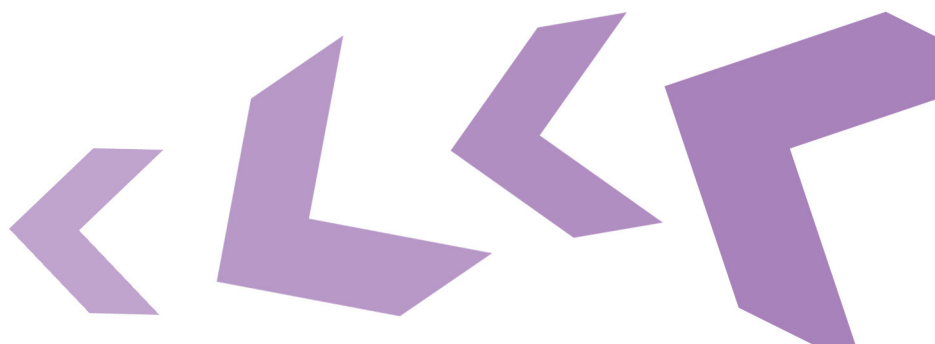
- Be as clear as possible with expectations from both teachers and students, which will help build trust.



- If many schools are involved, there needs to be one person responsible in coordinating the whole thing.



Chapter Five



5. Suggestions for the future

Finding long-term and sustainable structures for digital outreach

Most museums who participated in our interviews are lacking long-term and forward-thinking digital strategies for outreach. Many times, the museum professional interviewed realized during our conversations that a more long-term focus and agenda for digital outreach would be needed at the museum. Often, the digital outreach of the museum is based on verbal agreements and common non-formal understandings of what needs to be done on an on-going basis. Our results - which derive from a Nordic and Baltic context - correspond to other museum studies made, for example in the USA (Knight Foundation 2021). Short-term perspectives tend to inform digital pedagogy, which is problematic as it makes it difficult for museums to be proactive in responding to, or even contributing to shaping and leading, societal changes. In other words: short-term perspectives make museums reactive rather than proactive. In contrast, long-term perspectives increase resilience and adaptability, and importantly, make it more likely for museums to continue to be relevant for people in the future (Högberg, Wollentz & Holtorf 2022).

As mentioned in Chapter one, COVID-19 saw a rapid development of digital solutions at museums in order to reach out to the public in times of social isolation. These initiatives were short-term as they constituted a way to react to a sudden crisis surrounded by widespread uncertainty. As mentioned by one museum employee at the city museum in Helsinki, whom we interviewed:

Because of the pandemic, we jumped into this faster than we might have otherwise, and so we haven't had time to sit down and do long-term planning (...) now that we are going back to normal and people have started to dare to visit the museums again. It is absolutely true that we have to sit down and think about how we should use these resources. That is the interesting thing, how much should be live and how much should be digital?

No one knew how long the pandemic would last nor what kind of long-term consequences it would have. Short-term initiatives from museums were needed at that point in time. Nevertheless, it is now time to gather the many lessons learned, and connect them to visions, goals and strategies of the museum that are sustainable and resilient. It is important not to stress this process, but allow for it to be considerate and for it to take the time it needs. While a sense of digital fatigue may be currently present, research points to the digital being of increased importance in the future (Debono 2021). It is time to lift our gaze to be better prepared for a postdigital era.

In this chapter we will present some suggestions on how to become more future-aware when developing digital outreach at the museum. We will discuss the following actions:

- **Make room for long-term thinking and anticipation**
- **Locating the digital within a wider museum ecosystem**
- **Form intersectoral partnerships**
- **Set clear responsibilities for digital outreach**
- **Evaluate, adapt and experiment**


● **Make room for long-term thinking and anticipation**

Previous research has demonstrated that a lack of future awareness and long-term thinking is a systemic issue within the heritage sector at large (Högberg et al. 2017, Harrison et al. 2020; Högberg, Wollentz & Holtorf 2022). Despite preserving and protecting heritage for the sake of future generations, the sector is usually stuck in a “here and now” perspective. This needs to change as it makes museums vulnerable and less relevant than they could be. It became clear through our interviews that museums are largely lacking in digital strategies for outreach. Without strategies it is difficult to connect the work on digital outreach to the overall goals of the museum, or to national strategies in digitalization and outreach. Instead, it turns into a siloed enterprise, without synergies to other departments or other museums. It also becomes very challenging to know what to prioritize and why. Instead, decisions are usually made *ad-hoc* based on what feels right at that particular moment. As mentioned by one person we interviewed in Estonia:

Right now we don't have [a digital strategy]. We have just been doing what feels right. We have not had a big end goal where we want to go with this. Maybe we should discuss it now.



Importantly, long-term thinking is not achieved simply by writing a strategy. In fact, strategies can lock an organization in very short time perspectives if they are not adaptable to changes or imaginary enough. This is why we think that museums need to make room for long-term thinking and anticipation. A range of tools have been developed within so-called Strategic Foresight that can help organizations work towards the future in a more proactive and resilient way, beyond short-term strategies locked to political cycles (Holtorf & Högberg 2022).

These tools are available open access through easy-to-use toolkits, detailing methods such as Scenario planning and Horizon scanning (see UK Government 2017 for an excellent toolkit).



Importantly, Strategic Foresight is not about predicting the future, but used for creating more alternatives and options for the future. These options are subsequently used to outline actions needed to move in a desirable direction connected to certain goals and aspirations, e.g. a vision. It is therefore excellent to collaboratively and cross-sectorally within the museum work with methods from Strategic Foresight through workshops and discussions prior to developing a resilient digital strategy. It is worth pointing out that a separate digital strategy may not always be needed at your museum, but the digital can also be completely integrated in the overall strategy and vision of the museum. The latter can help move the museum towards a more cross-departmental approach to the digital, which is an important step to become a postdigital museum (Parry 2013).

Further, it is useful to connect any strategies and visions of the museum, to prioritize on the national level. Currently, the Swedish National Heritage Board (fall 2023) is preparing a new digital strategy in Sweden, which has the potential to become a great support for Swedish museums to prioritize and focus their work on digital outreach. However, as the digital strategy is not yet prepared and implemented, it is too early to say what kind of impact it will have on digital pedagogy in Sweden.

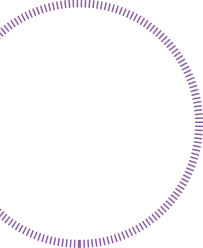
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- Is your museum having a strategy for digital outreach? Is it connected to national strategies and visions?
 - If yes: is it being used actively? In which situations do you use it and why? Are there situations where you wish you could use it, but where it lacks clarity or effectiveness? If so: can you identify those situations and how the strategy would need to be adapted to meet them?
 - If not: How do you think your organization could benefit from such a strategy?
 - Does your museum have an overall vision that helps you think long-term? Is digital pedagogy integrated in that vision?
 - If yes: How long are the future perspectives in the vision? Do you feel that it helps the organization be more responsive and proactive to changes in society?
 - Do you think methods derived from Strategic Foresight could help you develop a strong(er) and (more) forward-thinking vision?
 - If so: consider how such a vision can assist in the digital pedagogy of the museum.



● Locating the digital within a wider museum ecosystem

To avoid the common problem of siloing the digital work at the museum, a digital strategy will have to carefully correspond to and interconnect with overarching goals and visions at the museum. Even better: a strategy on digital pedagogy can be fully integrated into the overarching vision rather than being separated into a distinct one (Parry 2013). This will also make it much easier to argue for the relevance of allocating the needed time and resources for digital outreach. A useful step in that direction is to map the ecosystem of your museum and locate the digital links within it. This is a way to map the museum in a manner that is more dynamic, flexible and integrated than a common visualization of different departments (Malmsten 2023). Further, these links can then be positioned within a broader education ecosystem, including links to other actors engaged in learning (formal, informal and non-formal), other institutions sharing similar goals and challenges (such as libraries, archives and galleries), and public agencies.

Ecological frameworks are used analytically as it draws attention to the interrelatedness and interdependency between social actors, processes and environments (Sabiescu & Charatzopoulou 2018, 328). Ecosystems draw upon similarities and connections between the natural and the social world. While there are a number of different approaches, there are certain key-points to keep in mind when drawing an ecosystem (reworked from Sabiescu & Charatzopoulou 2018):

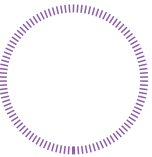


Holistic: the ecosystem is holistic in the sense that context needs to be applied to understand processes and phenomena. No single part of the ecosystem can be understood without locating the links to the wider system.

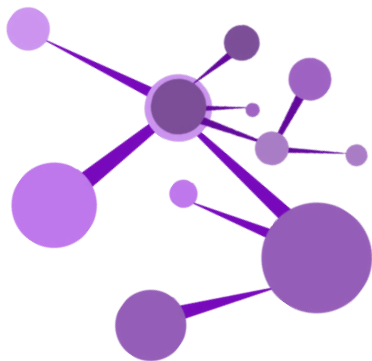
Systems thinking: it is through interaction that meaning is derived. In other words, it is through the links and constant exchange between nodes in the ecosystem that we can understand why changes occur and their implications.

Interrelated and interdependent: what is happening in individual nodes is embedded in and dependent upon the wider ecosystem, including shared conventions, goals and visions.

Co-evolution: changes in one node in the ecosystem will thus be both conditioned by as well as impact upon other nodes in the ecosystem.



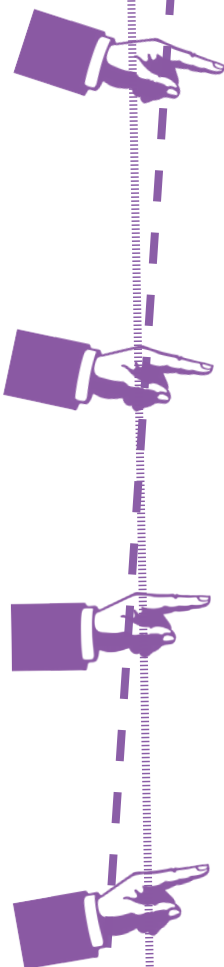
One way to visualize the ecosystem of your museum is to draw a map with nodes and links between them. If needed, there is software to be found online designed specifically to help draw an ecosystem, but it can also be achieved through a digital whiteboard such as Padlet, Google Jamboard or Canva. It is important here to both include the inner workings of the museum (collections, conservation, research etc) as well as the programs and efforts to spread and disseminate to a wider public (outreach activities, social media etc). The digital can be related to all the departments of a museum, but in different ways: it can be used in producing exhibits, in outreach, in conservation and restoration, in administration, in research, and so on. The purpose of mapping the ecosystem of the museum is to trace such links to better understand them. Ask yourself how these nodes are connected to changes and developments at the museum. Such an exercise will also reveal possibilities for a more integrated museum ecosystem, as it can highlight where new links can be made. When mapping the ecosystem, always consider how changes in one node will impact upon other nodes. Furthermore, think beyond only the physical museum building, towards a museum operating in several different forms and media.



When you have managed to map the ecosystem of your museum, it is time to locate the links to the wider context in which the museum operates. This has been called a dual frame (Latham and Simmons 2014). How such a wider context looks will vary from museum to museum, but usually include schools, public agencies, associations, boards, libraries, galleries, archives, companies and more. Obviously, other museums are included as well, but it is important to also draw the ecosystem wider than only within the sector, as it will allow you to locate links and interconnections that you would otherwise not have realized.

This is a form exercise that cannot be done alone, but should be a collaborative exercise involving as many departments at the museum as possible. The exercise will take a few hours and should be carried out on a regular basis to be able to trace changes over time, and determine if implemented actions have made an effect. The time spent, however, will pay back as it makes it easier to develop more effective, integrated and sustainable strategies at the museum.

Here are some things to keep in mind when mapping the ecosystem of your museum:

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- Do not map solely in accordance with the departments at the museum. Instead try to find where the lines between the departments connect, become blurred and where there is room for more exchange. When conducting the exercise, do not split groups based on department but mix as much as possible.
 - Try to move away from clear-cut distinctions between digital and physical activities in the mapping process. Trace how the digital is connected to all parts of the ecosystem of the museum. Avoid a distinct box called “digital”.
 - Account for change. Think not only on how the different nodes are connected, but also on how changes in one node may affect and be dependent upon other nodes.
 - Connect the ecosystem to the vision and goals of the museum (possibly developed through tools from Strategic Foresight as highlighted above). Think about what kind of ecosystem you would need in order to head faster in a desired direction and fulfill expectations. What needs to change and how can these changes be implemented?

● Form intersectoral partnerships

Museums tend to do their most innovative work when it is carried out in collaboration with others. The project that led to this book is a good example on how transnational partnerships can greatly benefit the work that is carried out, through sharing different kinds of experiences and brainstorming ideas together. There is great learning from other museums, by attending networks and conferences/workshops. However, as mentioned above, we also need to move outside our own sector and look at how libraries, archives, galleries, schools, associations, technology companies and others work with digital tools for interaction and participation.

When building these partnerships, it will become increasingly significant to consider how they can be sustained on a more long-term basis, i.e. beyond the extent of a specific time-limited project (see for example Armstrong et al. 2018). Furthermore, as underlined in Chapter four, we have a lot to learn from those we want to reach out to, for example from teachers. Finding ways of having ongoing contact with a target group can prove vital.


There is much to gain from forming strong partnerships with institutions who have different kinds of expertise, specifically in relation to digital tools and methods. This will make it much easier when contracting or otherwise collaborating with external actors, such as technology firms, in the development of products that the museum by itself lacks the resources and skills for, which is often the case when museums develop programs centered on Extended Reality (XR). Strong partnerships will improve the chances of finding a shared vision, goal and understanding together with actors who usually do not work with museums, and find structures to maintain an ongoing and open exchange throughout different creative processes.

● **Set clear responsibilities for digital outreach**

It needs to be clear who has responsibility for leading the work on digital outreach even if the process should be open and participatory. One way to achieve this is to set up a standing team at the museum who have ongoing meetings and follow-up activities. The standing team should be cross-sectoral and connect different forms of expertise and experience. Based on our interviews it seems to become increasingly common at museums to hire a person with specific responsibility for developing digital content. That is an excellent way to make sure that continuous work is being carried and that the necessary skills are present at the organization. However, the person responsible for digital production is seldom an expert in learning and education.⁴ This underlines the value in setting up a standing team who works on digital outreach cross-sectorally. Regardless of size, scope and resources at your museum, consider what steps need to be taken to set up such a team. As written in a report by the Knight Foundation (2000, 10):

Constructing cross-departmental teams to focus on digital, and providing training for that effort, will enable museums to be more resilient to a hybrid in-person/online dynamic that may become commonplace in the next few years.

⁴ Even though there are museums where the person responsible for digital production also has an expertise in education, such as at the Postal Museum in Tampere which we interviewed in 2022.




Another insight that was brought forward in the same report is the need to place a higher value on digital skills and competencies within the museum sector, and make sure that people with those skills have influence in decision-making and the opportunity to move up into leadership roles at the museum. This is also a way to make the museum a more attractive working place for people with digital skills. Hiring people who have expertise in *both* pedagogy and digital production (i.e. in digital pedagogy), such as at the Postal Museum in Tampere, should be made a high priority in recruitment.

● Evaluate, adapt and experiment

The only way to improve the work in digital outreach is to constantly evaluate and learn from visitor experience and target groups. It is vital to find structures for ongoing evaluation, adaptation and reflection upon the activities. The need for reflection should not be underestimated. Based on our interviews, museum professionals tend to be stuck in a high tempo that does not allow for a more critical reflection upon the long-term purpose of an activity, and how it may need to be adapted to fulfill such a purpose. Furthermore, evaluations need to be carried out in a more systematic way, connected to specific goals and learning outcomes. Time and resources for this kind of work needs to be allocated, as it will improve the chances of the museum to create truly meaningful experiences.

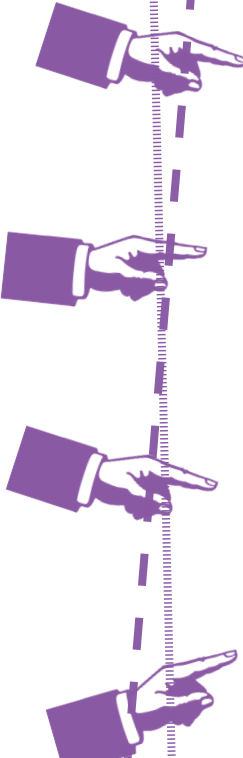
One important lesson from our project is the value in having time and resources to experiment in using different digital tools and approaches, depending on the goals of the organization. Our project made it possible for the partners from Estonia, Finland and Sweden to work in an experimental way, to dare piloting completely new pedagogical methods and approaches that the organizations never tried before, and learn from the experiences and from each other. In order to be creative, innovative and even on the forefront, there has to be room for experimentation and piloting. It was possible to work in that way for us, as we had external funding from ERASMUS+. However, museums would greatly benefit from finding forms and structures to work in a more experimental and innovative way also within the ongoing work of the organization. As argued in a report commissioned by Arts Council England based on methods derived from Strategic Foresight:

We (...) suggest some behaviours and practices [which are] likely to support organisations to respond proactively. This includes cultivating the capacity to be more experimental in harnessing new technologies and adopting new organisational practices. (Armstrong et al. 2018, 6)



To work in an experimental way requires careful planning and a proper consideration of goals and objectives. Ongoing evaluation and adaptation are key to successful experimentation. To be experimental means to be brave enough to venture outside comfort zones and pilot approaches and tools for the first time. It can also involve trying to reach target groups that you have not worked with before, or find new forms of partnerships and ways to co-create together. There will always be a degree of uncertainty when working this way. However, there is a value in a sense of uncertainty as it forces you to be more adaptable and flexible in your way of thinking and working. Even though working in a more experimental way might not on a short-term scale lead to positive outcomes in budgets and visitor experience, the long-term result would be a museum which is more dynamic, proactive, relevant and innovative.

Here follows some key points:

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- Establish clear structures for ongoing evaluation and adaptation of pedagogical programs at your museum. Always consider what you are in fact evaluating and why. Connect evaluation to specific goals and learning outcomes.
 - Establish structures which enable the possibility to be experimental and of piloting new ideas, concepts and ways of engaging with people using digital tools.
 - Consider carefully the vital links between piloting and evaluation, i.e. how structures for evaluation continuously function to improve the more experimental work at the museum.
 - Consider how evaluation, adaptation and experimentation in digital pedagogy can be included in the digital, or the overall, strategy of the museum.

Example 5: The development of a completely digital time travel by the Estonian National Museum and Audentes school

The Estonian National Museum and Audentes School developed a completely digital time travel to 21 August 1991, the year when Estonia regained its independence, within the Digital Solutions for Applied Heritage project. The main purpose was to be able to reach out with the time travel to more schools, including Estonian schools outside of Estonia. They decided to carry it out within a digital escape room format, which means that the students must carry out tasks and solve challenges to move to the next screen.

To carry out the time travel the students are split in groups (around three to six pupils in each group) and work on the time travel in front of computers. They will then collaborate to solve the tasks. The first task is to pick the first countries that recognized the independence of Estonia on a map. Thereafter, the students will have to select a role to play out of six different options: a member of the Estonian Defence League, a mother who is also working as a pharmacist, a student of Tartu University, a member of the Communist Party, a young businessman involved in illegal activities and a school principal. Each role has three different tasks that the students must collaborate to solve, ranging from crosswords, memory games, designing the print of a t-shirt, going through brochures and listening to music from 1991. Each role has three tasks and when the students finish one role, they will select the next one. All in all, 19 tasks were developed, and the most challenging part was to design 19 tasks that were all unique, creative, fun and educational.



Photo: Estonian National Museum

One benefit of the escape room is that it is easy to use and understand for both pupils and teachers. It does not need a long introduction for the teacher beforehand, which will likely make it more broadly used. Another benefit is that it is very clearly connected to the curriculum for the 9th grade as well as for the 12th grade within the Estonian school system. The tasks are therefore on a level suitable for both 9th and 12th graders.

This was the first digital time travel that the Estonian National Museum developed and neither the museum nor Audentes School had the digital skills needed prior to the start of the project. Therefore, a person with programming skills had to be hired within the project to assist in the development. It was very much a learning experience for both project partners involved, where new ideas and concepts were piloted, and where they had to work collaboratively with teachers and students to test and evaluate. The process was not straightforward and it involved venturing outside of comfort zones and required the development of new skills and competences. However, the long-term result is a larger confidence within both organizations to work with digital tools in education.

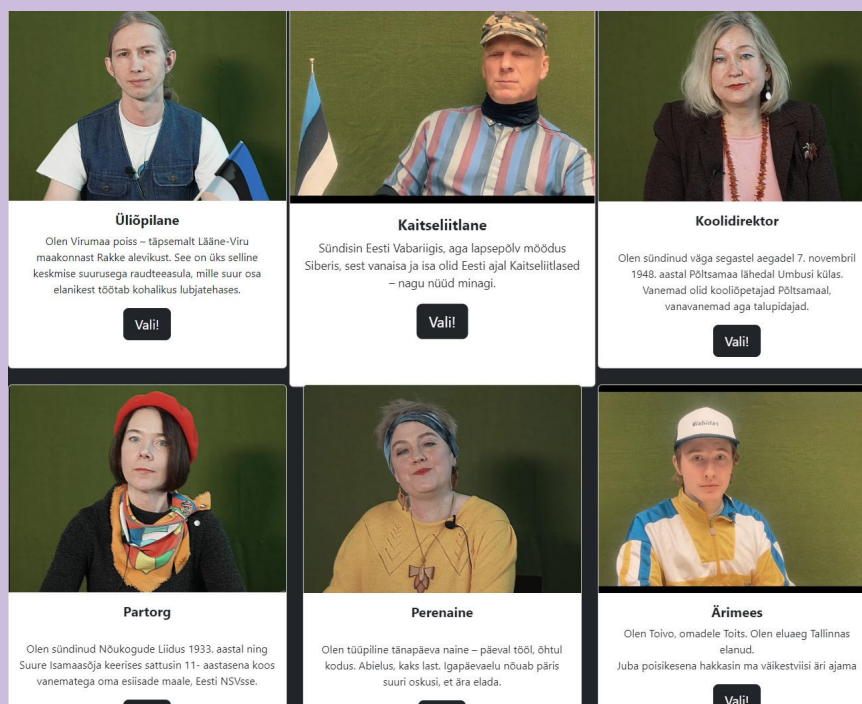


Photo: Estonian National Museum. The six roles of the digital time travel.

The purpose of the book is to provide food for thought in how to work with digital tools in outreach, focused on the concepts of learning, participation and co-creation. The book is primarily directed towards museum professionals, but everyone who wants to explore and develop their digital pedagogy will hopefully get some insights from it.

The first chapter introduces the project *Digital Solutions for Applied Heritage - Exploring Transnational Learning Opportunities*, funded by Erasmus+, which made the work shaping this book possible.

The themes that we are addressing throughout the book were based on a set of key challenges that we identified through a survey and interviews within the museum sector in Sweden, Finland and Estonia.

Key Challenges



- How to meaningfully connect and even move beyond the dichotomy between digital and the physical in outreach
- How to stimulate active participation and co-creativity by digital means
- How to achieve a more long-term focus and agenda in digital outreach
- How to get the most out of digital outreach in the face of limited resources and time

In **the second chapter**, we present ways that digital tools can be used to expand the museum experience by challenging boundaries. The main purpose of this chapter is to look at how museums can create more emotional, affective and memorable moments. Amongst other things, the focus is on how it is possible to engage with multiple senses in order to stimulate learning and participation, and we provide an example on how this can be achieved through easy-to-use technology, where some senses are stimulated while others are removed in a deliberate way. Thereafter, the chapter looks at how digital tools can enable a transnational form of storytelling by connecting multiple places and times in a more seamless way. This will likely become more significant in the future, as the world becomes more and more interconnected with large diasporic communities.

We also write about how to make more emotionally engaging experiences by different forms of digital technology, such as 3D prints and Artificial Intelligence. Thereafter, the chapter focuses on how digital tools can help make museums become more socially aware and better at responding to changes as they are emerging. Finally, we argue that digital tools can help take audiences behind the scenes, which can increase transparency and trust in the organization, as well as stimulate learning, participation and a sense of ownership to the stories that are being told.

In **the third chapter** the meeting points between the physical and the digital are explored. It looks at how it is possible to move towards what has been called the postdigital. The postdigital means a scenario where there is no clear-cut distinction between digital and physical within the pedagogical work at the museum, but rather a seamless switching between the two where the boundaries become blurred and even irrelevant. The chapter does this through looking at how it is possible to use elements of surprise, exploration and curiosity to enhance learning through a more creative blending of digital and physical.

The postdigital is also connected to a different educational form of storytelling, where many different media are combined, digital as well as analogue, and where each media is adding a valuable addition to the overall story. In this kind of storytelling, there may be many possible beginnings and many possible endings. This is often called transmedia storytelling, and there is an untapped potential within it for museums to work more participatory by letting more voices be heard on an equal ground, contributing to the story. We also argue that digital tools can be used to create safe spaces in different ways, for example for people with different forms of disabilities. Creating a safe space by digital means has the potential to also make the physical museum building feel like a safer and more welcoming place. Furthermore, the digital is a great way to follow a whole chain of events, from setting the scene, assessing expectations, to execution and to follow-up afterwards with evaluations, reflections and discussion.

In **the fourth chapter**, we focus on how digital tools can be a resource to achieve co-creation in practice. Our results from the survey and interviews reveal that museum professionals understand the concept of co-creation very differently. There is therefore a need to reach a shared understanding within the organization, as well as together with those you are co-creating with, of common goals and ways of working co-creatively. Digital tools can be a resource in making the museum a place where meetings are facilitated, based on listening to each other and sharing stories.

This is because digital tools allow for many ways to share a story that can fit different needs and occasions, such as through videos, photos, audio recordings, words written in a chat or on social media, body movement traced through motion capture, and much more. The digital can be a way of connecting people, where many different voices can be heard on a more equal ground. For this to be possible the museum needs to prioritize relationship building and allocate sufficient time and care for it to succeed. The digital will not in itself provide additional time for the museum for building vital and long-lasting connections.

However, the digital can be a way to build more respectful and flexible relationships, through both online and offline meetings and ways to interact. Rather than focusing primarily on the tangible products that co-creation can help produce, processes of building these lasting relationships should be seen as a central result within co-creation. These relationships will also be of great value to the museum in the long-term. If co-creation is a goal of an activity, then selecting which digital tools to use can be part of the co-creative process. In other words: the selection of digital tools can be done in collaboration with the group you are working with.

In **the final chapter**, we focus on how the museum can develop a more sustainable and long-term focus in digital pedagogy. The interviews and survey revealed that most museums still have not started thinking long-term about their digital outreach activities, but tend to be stuck in a here-and-now perspective. In order to develop a more sustainable and effective digital strategy, we suggest that the museum needs to make room for long-term thinking and anticipation.

There are a set of established tools within Strategic Foresight that are available Open Access and that can be implemented through workshops to increase the future awareness of the organization. This will help build more resilient visions and strategies. Furthermore, there is a great value in locating the digital within the wider ecosystem of the museum. This will help reveal how the digital is deeply interconnected to all parts of the working of the museum, as well as to the wider context in which the museum operates. It will also inform how a more integrated museum ecosystem can be created, where the digital is less siloed from the rest of the museum.

This chapter also argues for the benefit in forming intersectoral partnerships, to actors within as well as outside the heritage sector, for example to tech companies and departments of education and in-service training of teachers.

The museum should make clear who has responsibility for digital outreach and pedagogy, and preferably set up a cross-departmental standing team who will work on it on an ongoing basis. Digital skills should also be higher valued at museums in general, which will make them a more attractive workplace for people with the necessary competencies. People with skills in both digital tools and pedagogy (i.e. in digital pedagogy) will likely become increasingly important at museums. Finally, the project greatly showed the value in being able to work in an experimental way when piloting new digital solutions for learning, and the need to constantly evaluate and adapt.

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List of useful tools and resources

Here follows a list of many of the tools and resources that we are writing about in this book. The list does not aim to be exhaustive, but cover some of the most popular tools and resources within the museum sector in Sweden, Finland and Estonia. Most of them, except for the applications for digital storytelling, have both free versions with some limitations, and versions which need paid subscriptions, depending on the needs. Be aware that things change rapidly in the digital world, and that these tools and resources may be outdated quickly.

Easy to use tools for video meetings/workshops/seminars/conferences

- **Zoom (Zoom Video Communications)**
- **Teams (Microsoft)**
- **Google Meet (Google)**

The differences between these tools are small, and museums often have to adapt to what the schools and teachers are comfortable with and which they are using within the municipality. One of their most useful aspects from a pedagogical perspective is the possibility to assign multiple Breakout Rooms where smaller discussion groups can be created.

Applications and tools for a more seamless experience

- **OBS**

The tools above can be used in combination with OBS (Open Broadcaster Software) which is a free open source program for video recording and live streaming. The benefit of OBS is that it can be used in combination with most other media in an integrated way, which creates a more seamless experience. It can stream content directly to most social media platforms such as Facebook, TikTok, Instagram and Twitch.

Digital whiteboards

- **Padlet**
- **Google Jamboard**
- **Canva**
- **Miro**

Digital whiteboards offer a range of options to do collaborative and creative brainstorming sessions online. They are essential for completely digital workshops, but can also be very useful for taking notes and gathering thoughts during a physical meeting.

Tools for interaction

- **Mentimeter**
- **Kahoot**
- **ThingLink**
- **Seppo**

Mentimeter is an effective and intuitive tool for asking questions to an audience. The answers can be displayed live through word clouds, graphs or tables. They can also be organized according to certain criteria.

Kahoot is a popular online game-based learning platform, which can be used for quizzes and other types of interactive multi-choice games.

ThingLink is a platform that is most commonly used to create and share interactive photos. It can be used for visual storytelling and create context surrounding photos.

Seppo is a platform for adding different forms of gamification elements into an educational program.

Tool for non-linear presentations

- **Prezi**

As a popular alternative to PowerPoint, Prezi offers a more non-linear way of storytelling. This tool provides a map-like overview with the possibility to select between multiple topics, zoom in on certain interesting aspects, and pull back to reveal the overarching context. It can also be used to present a topic in a more non-linear way through an online platform, as Jamtli did within the *Digital Solutions for Applied Heritage* project. Jamtli used Prezi to be able to present the history of significant female artists in Sweden in a more interactive and engaging way.

Applications for digital storytelling

OnSpotStory

Through OnSpotStory, organizations can create their own mobile applications through a user-friendly platform. The application can employ interactive maps, Augmented Reality, gamification elements, guided tours and other forms of place based storytelling. The application is developed based on the unique needs of each organization.

StoryMap, ArcGIS

StoryMap is an application within ArcGis, which is commonly used by archaeologists at museums to create, manipulate and explore geographic information. With the StoryMap application geographical information can be integrated into storytelling. You can design your own maps through the software, and add storytelling elements to places. You can also add stories to already existing GIS-based maps.

Tools for evaluations and surveys

Crowdsignal is a software for surveys, polls, and contact forms. It is an excellent tool for evaluations as it is possible to export the answers in many different formats, such as in spreadsheet, and analyze the answers using different filters. It also allows for many ways to answer a question.

Google Forms is an easy-to-use tool for questionnaires, surveys and contact forms. It is possible to make simple quizzes in Google Forms.

Databases for museum collections (relevant in a Nordic context)

DigitaltMuseum is a database for Norwegian and Swedish museums and collections, providing access to more than 3.9 million objects (as of 2023) from 100 museums in Norway and Sweden. DigitaltMuseum is developed by KulturIT and funded by Arts Council Norway.

Finna.fi is a search service for finding material from archives, libraries, museums and other organizations in Finland. Not only is Finna.fi making material accessible, but it also develops ways to work with the material as educational resources, for example through specific packages tailored for teachers. Finna.fi also provides a service which helps you find historical photos from the place you are currently located at (in Finland). It is maintained by the National Library of Finland.

Europeana is the EU Cultural Heritage portal. It contains digitised cultural heritage collections of more than 3,000 institutions across Europe, including over 50 million cultural and scientific artefacts. The service is initiated by the European Union.

History of Sweden (Sveriges historia) is a digital learning resource for schools, developed by the National Historical Museums in Sweden, and designed to fit the Swedish curriculum. <https://sverigeshistoria.se/en/>

The project participants

For you to get to know us within the project better, we have let each project organization answer four questions.

Hello NCK, Sweden

Why did your organization want to join the DiSAH project?

NCK is a research and development center focused on learning through heritage, and we try to connect theory, practice and policy through projects, conferences and courses. We want to do things that are helpful and useful to the heritage sector. In this case, we saw a need within the museum sector at large to develop its competencies in digital pedagogy, especially in regards to active participation and co-creation. This became increasingly relevant to address when COVID-19 hit the world. We hope that the results can help and inspire others in different ways, for example through this book or through many of the workshops and seminars we have organized.

What was the experience of your organization with digital tools in outreach prior to the project?

Our experience in digital pedagogy was quite limited prior to DiSAH. We had organized a few digital conferences and courses because of COVID-19. However, the project was really a learning opportunity for us. Since it started we have also gotten involved in additional projects focused on digital pedagogy, so it has become an ongoing focus lasting beyond the extent of this project.

What were the biggest challenges during the project?

It must be the constant uncertainty of being project manager of a transnational project during COVID-19. Our first project meeting had to become digital rather than physical. Events and seminars had to be postponed. In general it required a constant flexibility and adaptability to emerging changes.

What were the most positive outcomes of the project for your organization?

The development of new models for pedagogical outreach that we think are quite innovative and exciting, such as a transnational time travel. In general, the spirit of working together with the other project members in such a collaborative, creative and experimental way has really been beneficial - it constantly challenges you to think in new ways.

Hello BARK, Children's Cultural Network in Ostrobothnia, Finland

Why did your organization want to join the DiSAH project?

The theme was very current, and it felt like it was a project that could create useful methods to use in our daily work. As we work with heritage education and time travels it felt very exciting to try to take this to a new level and above all try a transnational model. It was a great way to pilot new models in this field as well as working together with partners from other countries. It was a way of developing our own work, but also inspiring our local and regional partners to new ways of working with heritage education.

What was the experience of your organization with digital tools in outreach prior to the project?

Before the project started, we had worked with digital time travels in an escape room-format as well as some digital programs. These activities were carried out in the beginning of the pandemic, and we saw a need to develop something new through synergies with other partners.

What were the biggest challenges during the project?

The project was done in a time when a lot was changing in the digital, but also physical world. During the pandemic, the digital tools developed considerably and as time went by, the interest of using them in a post pandemic world changed. The war in Ukraine brought some subjects to the forefront, which had to be handled with care.

As some of the outputs produced were pilots, it was hard to know beforehand how much work they would mean for the schools involved. To work with several schools of different sizes and different management cultures required a lot of discussion with each partner as well as coordination. In addition, all filming and editing took a lot more time than we had thought.

What were the most positive outcomes of the project for your organization?

It was a joy to see how engaged the teenagers were in the co-creation process and the interest it created in them. It leads to a new way of looking at heritage, history, and the society you live in. This created immediate new models for the teachers and schools on how to work with heritage education and history. This project was urgent on so many levels and was a true co-operation locally, regionally and internationally. For us, this created at least two new ways of working with time travels: the co-creative and the transnational model. These are outcomes we will work further with in the future.

Hello Estonian National Museum

Why did your organization want to join the DiSAH project?

During COVID-19, the online availability of educational programs and materials of museums came to the fore. Since we had carried out time travels physically, the DiSAH project gave us the opportunity to develop this possibility digitally. We saw it as a chance to use digital time travels to reach schools that have already participated in time travels, as well as schools that are still unfamiliar with this method. We also wanted to reach schools that are too far away and therefore have not had the opportunity to participate, including Estonian schools abroad.

What was the experience of your organization with digital tools in outreach prior to the project?

Yes, our museum exhibitions use digital tools and data every day. But in regards to our Education Department: before the COVID-19 crisis, our museum had few digital educational materials. During the crisis, we developed the format of both online lessons and tours and we still use them today. However, during the DiSAH project we developed a digital game for the first time.

What were the biggest challenges during the project?

How to give a digital game the feeling of a time travel. I believe that we managed it quite well, solving it through six different characters who represent the different viewpoints of this era, which is the re-independence of the Republic of Estonia in 1991.

What were the most positive outcomes of the project for your organization?

Our digital skills and courage have definitely improved. Throughout the project, we had good cooperation with the teachers both in the game input and testing phases. With the digital time travel, we were able to reach schools both in Estonia and Estonian schools abroad, so our cooperation with different schools have improved.

Hello Audentes school in Tallinn, Estonia

Why did your organization want to join the DiSAH project?

Audentes school promotes self improvement for teachers and this project gave teachers the chance to test themselves in an international project. We think international communication is extremely important from the perspectives of both students and teachers. This project enabled that. We found that the project helps tremendously to broaden the horizons of teachers and students and see historical events and study processes from a European perspective. Taking part in the project gave us an excellent opportunity to improve our IT capabilities and intertwine various subjects using digital solutions. We also had the opportunity to do something that has never been done before in Estonia, namely a digital time travel.

What was the experience of your organization with digital tools in outreach prior to the project?

There is an educational technologist working at Audentes school who is responsible for frequent training for teachers. Teachers also regularly share their best ideas and practices with each other. There is a digital solutions competition every year that both students and teachers can participate in, where they can show their various digital projects. We have three stationary computer labs and two "traveling" computer labs with iPads and Chromebooks. Teachers use digital tools often. During Covid19 we had a fully developed system for online studies, using Teams and e-school. We have not done any programming ourselves.

What were the biggest challenges during the project?

The biggest challenge was finding people to help with programming for the digitalization of the time travel. We needed to create a variety of tasks that would work in an online environment, and it was quite challenging. Scheduling was also difficult from time to time due to the amount of people and international partners involved.

What were the most positive outcomes of the project for your organization?

We most definitely value the experience of international cooperation and the creation of the digital study materials with the Estonian National Museum that all Estonian teachers and students in Estonia and Estonian schools abroad can use. We have popularized a key event in Estonian history (restoring our independence in 1991). We hope that this study material will remain in use for years to come. We got to improve the cooperation with teachers and our own readiness to participate in international projects.

Hello Jamtli, the regional museum of Jämtland, Sweden

Why did your organization want to join the DiSAH project?

We had been experimenting with some digital programs due to the pandemic, but felt we needed to exchange experiences with colleagues at other museums.

What was the experience of your organization with digital tools in outreach prior to the project?

We had offered some digital programs in the exhibition, experimenting with pre-filmed movies used in a studio-setting. We were just about to start developing the studio when we joined the DiSAH project. We were quite uncertain about to what extent our programs were beneficial for the schools and we also had no idea what would happen after the pandemic. Would schools still ask for digital programmes?

What were the biggest challenges during the project?

In the start a big challenge was technical issues, for example the internet connection at the museum. The biggest pedagogical challenge was how to create interaction in a good way with the pupils in the classroom. How to break down the barriers of the screen.

What were the most positive outcomes of the project for your organization?

We now feel more confident in what we do. A very positive outcome has been the use of Mentimeter, as it is an excellent solution on how to interact with pupils.

Hello Kalmar County Museum, Sweden

Why did your organization want to join the DiSAH project?

During the pandemic we had great need for development of digital tools in order to reach out. Our museum has always been a “Hi-touch”-museum, so taking new steps into the digital world felt better in a group, where feedback could be given by other professionals. International cooperation is something that we also find very fruitful, giving new insight and challenging new ways to work. The partners were strong and innovative institutions known to us before and digital cooperation seemed very suitable during the pandemic. The fact that a joint educational program was discussed in an initial phase was also very inspiring for us, connecting learners, institutions and heritage from different parts of the Baltic Sea in a new way.

What was the experience of your organization with digital tools in outreach prior to the project?

We had quite few experiences beforehand. Our educational toolbox has been very low-tech with physical storytelling, roleplay, drama and similar programs. Due to our extensive international cooperation with partners globally we had some experience in digital cooperation i.e., digital meetings, joint documents etc, but using digital tools in outreach/ educational programs was new to us. The only exception was some experience with Virtual Reality, although it was the Archaeological Department and not the Educational Department that was responsible for the development work in VR. During the pandemic we also started podcasts, live streaming, virtual tours, parallel to DiSAH.

What were the biggest challenges during the project?

The biggest challenge was in some sense the contact with schools, because of two reasons. Firstly, there was no local school as formal partner in the project, so we had to rely on their own interest and resources to participate. The bigger problem was that we saw a clear tendency of “digital fatigue”, the teachers wanted to go back to the physical meeting with the museum as soon as possible. This led to time periods during the project where it was hard prioritizing the development work, since the schools lost interest in digital tools and instead visited the museum.

What were the most positive outcomes of the project for your organization?

The most positive outcome is that we now have a clear method and platform for enhancing our flagship educational program, the Time Travel, with digital tools. The method is tested and functional, the platform is easy to scale up to include new time periods and schools. We have a strong belief that it will be useful and sustainable since it is linked to the Time Travels and not developed as a standalone tool or program. We also had the opportunity to really listen to teachers, to find their challenges in preparing the learners prior to a Time Travel and their ways to use the Time Travels in a relevant way. We have also learned much about the possibilities and challenges with development of digital tools, both from our own work and from the other DiSAH-partners.

Survey on the use of digital tools

Compiled by Kristina Jonsson

About the survey

The survey on the use of digital tools in museums was conducted November 2021 – March 2022. It was sent out broadly to museum employees in the three countries that are involved in the DiSAH project: Sweden, Estonia and Finland, using the lists of museums provided by the museum associations in each country. The total numbers per country are:

Sweden: 37
Estonia: 31
Finland: 17
Sum: 85

The survey consisted of 32 questions and was conducted with the survey tool Crowdsignal.

The first five questions regarded basic information about the respondents and their workplaces: Name, Email-address, Museum, Responsibilities/role at the museum and Number of employees at the museum. The last question regarded the respondents will to answer further questions if needed within the study. The answers to these six questions (1–5, 32) are not accounted for in the text below.

The survey was distributed in both Swedish and Finnish in Finland depending on the respondent's mother tongue: the results have been merged together in the presentation below, to represent the country as a whole.

Please note that the percentage is calculated on the total number of answers given. On some questions, when the informant has the possibility to provide multiple choices, the percentage is not calculated on the total number of museums participating. These questions will be marked with an *.

The survey was followed by in-depth interviews with a selection of respondents.

Question 6: How are digital tools used for educational activities? *

Five alternatives and a free text option were given, with the following response rate in percent:

	Sweden	Estonia	Finland
Show the exhibitions	31%	26%	30%
Information about the museum and its activities	28%	26%	23%
Show the collections	19%	17%	24,5%
Roleplay/time travels	4%	2%	6%
Gaming (e.g. escape rooms)	1%	11%	9%
Other options	16%	18%	7,5%

In all three countries, the most common answer was “show the exhibitions”, followed by using digital tools for the spread of information about the museum and what’s going on. The least common activities are the use of gaming and roleplay/time travels.

Among the other options given, there are some recurring answers. Digital tools are mainly used for a) remote lessons and workshops, b) digital guides (in museums or city guides etc.), c) digital dissemination such as taped lectures, concerts, podcasts, and d) interactive complements in learning and experiencing (quizzes, search and orienteering games, Seppo games, visualization of data, mood creation, Thinglink). One answer mentions VR and AR contents in an exhibition, another a short course on Estonian culture aimed at new immigrants with the implementation of the digital educational platform Education on the screen.

There are no obvious major differences between the three countries regarding the use of digital tools. What might be noted is that the Swedish museums don’t seem to use gaming and related techniques to the same extent as the museums in Estonia and Finland.

Question 7: How important do you think digital tools are in educational activities?

The question could be answered in three ways, below is the response rate in percent:

	Sweden	Estonia	Finland
Very important	49%	30%	47%
Quite important	49%	57%	53%
Not so important	3%	13%	0%

The result reflects that a greater importance is being placed on digital tools in Finland and Sweden than in Estonia.

Question 8: Which digital tools are used in educational activities? *

A list of common digital tools were supplied, and also the option to add Other.

	Sweden	Estonia	Finland
Youtube	29%	26%	22%
Teams	21%	15%	22%
Zoom	16%	21%	8%
Virtual Reality (VR)	3%	6%	9%
Augmented Reality (AR)	2%	1%	11%
Jamboard	2%	1%	0
Padlet	0	6%	4%
OBS (Open Broadcaster Software)	0	2%	0
None	6%	5%	2%
Other options	20%	17%	22%

Of the listed suggested tools, Youtube is the most commonly used, followed by online meeting platforms such as Teams and Zoom. VR and AR is upcoming. VR more in Finland and Estonia than in Sweden (cf. gaming in Question 6). AR more in Finland.

Other options have been listed as well, where the most common are: a) Social media such as Facebook, Instagram, b) digital applications such as apps, websites, audioguides, QR-codes, digitized objects and environments (e.g. livestreaming, Vimeo, databases, Pantour Pro), c) other online meeting or visual collaboration and learning platforms (Skype, Meet, Miro, ClassFlow, Kahoot), d) design and presentation platforms (Canva, Procreate, Genially, iMovie, PuppetEdu, Prezi) and d) National digital solutions. In Finland the use of Thinglink, Seppo, Finna classroom and eMuseo is listed.

Less common, as has been showed above, is AR and VR solutions, robotics are also mentioned.

Question 9: Which target groups do you aim these activities to? *

A list of age groups was supplied, and also the option to add Other.

	Sweden	Estonia	Finland
School children (7–10 years)	19%	18%	20%
School children (11–15 years)	20%	23%	18%
Youth (16–19 years)	16%	20%	14%
Adults	10%	16%	18%
The public	17%	11%	14%
Retired people	9%	6%	9%
Immigrants or other minorities	8%	2%	5%
Other options	1%	4%	1%

In all countries, school children of different ages are the main target group, followed by youths, adults and the general public. Minorities are more seldom targeted, as for other options the only mentioned are young pre-school children (kindergarten age).

Question 10: Do you combine digital tools in one activity?

This was a simple yes or no question.

	Sweden	Estonia	Finland
Yes	51%	45%	59%
No	49%	55%	41%

Question 11: What digital tools are combined?

This was an open question where examples were listed in free text.

Examples are a) combinations of online meeting platforms (Zoom, Teams) combined with tools such as Jamboard, Youtube, Vimeo, Padlet, Menti, Kahoot, AhaSlides, Thinglink, Seppo b) the combined use of computers, mobile phones, microphones in online sessions, c) digital applications on websites (social media, videos, webcam), d) the use of apps, QR-codes etc. in the museum exhibitions, e) connecting AR and VR experiences with tasks in other digital platforms.

Question 12: How are they combined? (digital tools)

This was also an open question responded in free text. Some of the answers relate to what has already been answered in the previous question.

Question 13: Would you be interested in combining digital tools? Please motivate why

This was a yes or no question, with the possibility to comment.

	Sweden	Estonia	Finland
Yes	94%	59%	86%
No	6%	41%	14%

The interest is highest in Sweden, and lowest in Estonia.

Comments that have been made circle around the following topics: a) many are in the startup phase, sparked by the pandemic, and want to develop their digital range and knowledge. It is pointed out that there is a need for developing skills related to the theme, preferably in a simple educational and instructive way, b) the cost of digital and knowledge development is an issue that can be a restraint, c) the possibilities of offering visitors an interactive experience without having to actually visit the museum is a good thing, and also the possibility of making physical visitors more engaged.

In one answer the respondent stresses the importance of the work being done by the museum pedagogues, and that no digital media can replace a good teacher. They can however be a useful bonus.

Question 14. What is the most challenging thing about digital pedagogy in comparison to pedagogy in a physical space? Please comment. *

The question was provided with four alternatives, and the possibility to add extra options.

	Sweden	Estonia	Finland
Stimulate active participation	19%	10%	29%
Stable internet connection	14%	19%	24%
Complications with the tools and software	16%	13%	12%
Maintain participants' interest and attention	24%	42%	18%
Other options	27%	16%	18%

The other options mentioned are to a large extent related to the suggested alternatives: technical issues (bad internet connection, difficulties with lighting, sound and keeping the camera still) and problems with maintaining a contact with the audience. One of the Swedish respondents complains about schools in particular having a very low interest in digital viewings.

The need for more digital knowledge and other resources is also pointed out in this context, as well as the difficulties in enabling a passing on of experience and knowledge.

Question 15: Have you found ways to deal with these challenges? How?

This was an open question responded in free text.

On the topic of engaging the audience, the following is a summary of the suggestions: Marketing and communication is important, facilitates tailoring of events. Be well prepared. Small groups work best, maximum a class. Everyone should be visible the whole time. Switch views between teacher and students. Class teachers should be active helpers. Active participation and variety are crucial, create creative and interesting solutions and tasks. Ask control questions to keep people's attention. They should not take too long, maximum 15 minutes. When possible, combine the physical and digital to get the good out of both.

On technical challenges: create a recording studio with good internet connection, work with extra and movable lighting, customize the contents to what works well on the internet, explore and choose the right software and tools, use the aid of IT specialists to develop digital solutions if possible, inform and question the participants in advance about connectivity, prepare for technical problems (possibility to move to mobile network, have several devices at hand, use assistants).

Question 16: Do you have access to staff with digital knowledge and skills?

This was a simple yes or no question, with the possibility to add other options.

	Sweden	Estonia	Finland
Yes	65%	77%	71%
No	14%	23%	29%
Other option	22%	0	0

About two thirds of the museums in Sweden say they have skilled staff within the digital field. More of the museums in Estonia and Finland have it, almost 80% in Estonia and more than 70% in Finland.

Some respondents have added further comments, where they say that they have it to some extent but they may not have full necessary knowledge or always be at their disposal. Staff educated within IT are not necessarily available, and there has been a lot of learning by doing during the pandemic.

Question 17: Do you work with digital tools to stimulate co-creation and active participation?

	Sweden	Estonia	Finland
Yes	59%	55%	47%
No	41%	45%	53%

More or less half of the respondents have answered that they use digital tools to stimulate co-creation and active participation. Though it differs some, and it's most common in Sweden and least common in Finland.

Question 18: What tools do you think are most effective in stimulating co-creation and active participation? Please explain why.*

Eight alternatives were given, and the possibility to add other options.

	Sweden	Estonia	Finland
Teams	32%	17%	35%
Zoom	14%	28%	15%
Padlet	0	10%	10%
Virtual Reality	0	7%	10%
Augmented Reality	4%	3%	15%
Skype	4%	7%	0
Jamboard	0	3%	0
OBS	0	7%	0
Other options	46%	17%	15%

Of the listed suggestions, only Teams and Zoom are frequently used. Other options that have been mentioned are Meet, Youtube, Instagram, Facebook, Messenger, QR-codes, apps (both free and proprietary), PreziVideo, Aha Slides, menti.com, Answergarden, BigBlueButton, Actionbound, Miro and wordclouds.

As for the motivations to why certain tools have been chosen, several have answered that they are not familiar with all listed tools and that they use the ones they know that have the functions they need. It is also mentioned that the familiarity with certain tools on the receiving end is important (e.g. schools know how to use Teams, visitors at museums are familiar with QR-codes, BBB doesn't acquire a download on your device). Some have developed their own software, some are obliged to use the ones that are allowed at the workplace.

It is mentioned that a good thing for participation is tools that allow the participants to answer/ask questions/express an opinion (e.g., Mentimeter, Genially, Kahoot). One respondent has pointed out that combining digital and physical activity produces the best results, and that of the purely digital tools, AR and VR are the easiest platforms to design a good interactive experience.

Question 19: Can you briefly explain how you stimulate co-creation and active participation through these tools?

This was an open question responded in free text.

The examples given circle to a large extent around active communication, that museum visitors/students are encouraged to give feedback, discuss, solve assignments. This can be done in breakout rooms, through the use of apps, bulletin board-type platforms etc. Digital tools also make it possible for people who cannot make it to the museum in person to participate.

Question 20: Which target groups do you aim these activities to? *

A list of target groups was supplied, and also the option to add Other options

	Sweden	Estonia	Finland
School children (7–10 years)	22%	23%	18%
School children (11–15 years)	21%	23%	18%
Youth (16–19 years)	11%	23%	15%
Adults	10%	18%	15%
Retired people	10%	5%	15%
The public	14%	5%	12%
Immigrants or other minorities	6%	3%	3%
Other options	6%	0	6%

The dominating target groups in all countries are school children. Youth is an equal group to school children in Estonia.

Other options mentioned are preschool children and adults/elderly in nursing homes.

Question 21: Do you use hybrid solutions?

This was a yes or no question.

	Sweden	Estonia	Finland
Yes	24%	50%	59%
No	76%	50%	41%

Hybrid solutions are more common in Finland and Estonia than in Sweden.

Question 22: How do you combine the physical/digital in an activity in the most effective way?

This was an open question responded in free text.

The answers circulate around using a combination of digital broadcasting techniques (film, Zoom etc.) with live performances such as lectures and guidings.

Question 23: Which target groups do you aim these activities to? *

A list of target groups was supplied, and also the option to add Other options.

	Sweden	Estonia	Finland
School children (7–10 years)	15%	16%	15%
School children (11–15 years)	18%	18%	18%
Youth (16–19 years)	12%	20%	18%
Adults	15%	21%	15%
Retired people	12%	13%	13%
The public	21%	7%	15%
Immigrants or other minorities	3%	5%	5%
Other options	3%	0	0

In Sweden the main target group is the public, followed by school children of various age, and adults (and after those youth and retired people). In Estonia, adults and youth dominate, followed by school children. In Finland school children, youth, adults, the public are the most common groups followed by retired people. Few have targeted immigrants and other minorities.

Another option was mentioned from a Swedish respondent: teachers.

Question 24: Are you interested in solutions that combine the digital/physical? Please explain why.

This was a yes or no question with the possibility to add comments.

	Sweden	Estonia	Finland
Yes	89%	71%	57%
No	11%	29%	43%

The responses varied quite much. In Sweden the interest is high, and combined solutions are described as giving opportunities for more interactivity and variety which sparks interest, and enhancing the possibilities for more people to participate without having to travel. There are also those who say that it takes too many resources and is therefore unrealistic, and that the interest has been low for digital opportunities. Similar responses, both positive and negative, have been given by participants from Finland and Estonia.

Question 25: Do you use any application specifically designed for digital storytelling? Which one(s)?

This was an open question responded in free text.

In Finland, the following is used: Thinglink, Youtube and Tarinasoitin, AR and Zoom. In Sweden, StorySpot and HiStory is mentioned. In Estonia, most do not use any such applications.

Question 26: If so, describe how to work with these applications?

This was also an open question related to question 25.

The answers refer mainly to specific exhibitions and tours, where digital presentations, sound effects etc. are used.

Question 27: Do you produce your own content for digital educational activities?

This was a yes or no question.

	Sweden	Estonia	Finland
Yes	86%	94%	94%
No	14%	6%	6%

Question 28: Have you contracted external companies to produce digital content?

This was a yes or no question.

	Sweden	Estonia	Finland
Yes	46%	13%	71%
No	54%	87%	29%

Question 29: What challenges have arisen in working with external companies? *

This question was given three alternatives, with the possibility to add other options

	Sweden	Estonia	Finland
To make the content and tools user-friendly	25%	44%	38%
To make the content and tools useful for educational activities	25%	33%	23%
To make the public aware of the material	33%	22%	23%
Other options	17%	0	15%

“To make the content and tools user-friendly” is the most common alternative in Estonia and Finland. Finland has an equal spread among the two other alternatives. “To make the public aware of the material” is least common in Estonia. Sweden has a rather equal spread among the three alternatives, though “To make the public aware of the material” is most common.

Other options mentioned were the challenge of making external companies understand the issues the museum is working on (Sweden), and to coordinate schedules with them (Finland). Another was the difficulty to get the material to hold the same standard as other already existing materials (Finland).

Question 30. Do you set the same price for digital activities in relation to physical activities?

This was a yes or no question, with the possibility to add other option.

	Sweden	Estonia	Finland
Yes	32%	45%	24%
No	32%	55%	76%
Other options	35%	0	0

The responses differ, in Finland the majority have answered no to the question, while in Estonia the result is about 50/50 with a tilt towards no. In Sweden about a third of the answers say yes and a third no, and it's only from Sweden that other answers have been given.

The other options lean heavily towards digital solutions being cheaper: many give free digital activities to schools and offer free digital viewings of the exhibitions. One answer points out that the free activities have been related to the pandemic, and one that viewings for adult booked groups come with a charge. It is also mentioned that the cost depends on who produces and if there is a need to purchase new technology.

Question 31. How do prices differ?

This was an open question answered in free text.

The answers correspond to some degree to the other options already given as answers to question 30. Many, above all from Sweden, state that digital activities are free or cheaper than physical activities. There is however one contrary answer, which says that booked digital guidings cost twice as much as booked on-site guidings since they require more personnel. From Estonia there are examples of differing prices for different kinds of groups for online lessons (students and other groups), but also of the same price being set whether the activity is digital or not.

