VIMM

Thematic Area 2: Directions

Working Group 2.3: Future in Mind

The chairwoman WG 2.3: Francesca Guerrera

The experts WG 2.3 are: Ez Yuan, Ghislaine Boddington, Petja Janžekovič, Aleksandra Kostič, Tadej Vindiš, Jasper Ceelen, Bram Elewaut, Andre Selton, Marco Streefkerk

Abstract

The Working Group 2.3 Future in Mind of the VIMM Thematic Area 2-Directions has provided the outcome of work: a vast list of 41 best practices and state of the art examples of platform, collaborative projects and business models in order to gain sustainability used in CH VR/AR. It included an analysis of some bad practices and examples too.

Introduction

WG2.3 has focused on the following topics:

- platforms
- collaborative projects
- business models

The outcome of the work includes a vast list of best practices and state of the art examples of sustainability used in CH VR/AR. Even though far fewer posts were written about the future, we do feel this subject is of paramount importance if we want to work on future-proof solutions and advice for legislation that can be applied for longer than a few years.

Challenging questions:

- How can cultural heritage collaborate with existing technological platforms, models and already implemented solutions?
- How we can create digital solutions that are ready to use and future-proof?
- What options are for collaboration between CH organizations (and other ones?)
- Are there any privacy issues?
- Business models of digital technologies in general
- Find options to make VR more sustainable

- Find options for collaboration between CH and tourism, hospitality by using VR

- Could a museum copy a new business model?

- Can any place become Virtual Museum?

- What can museums learn by looking to the startup community?

- How can technology be financed? How to create a "benefits plan"?

- Do we make VR for specific target groups or all target groups and how?

- What is next for collaborative sharespaces?

Platforms, collaborative projects, business models (41 cases)

1. Cleveland Museum of Art/Gallery One

http://www.clevelandart.org/artlens-gallery/first-iteration

The original experience consisted of ten interactives: the Collection Wall,three interactives designed for children and located in Studio Play, and six interactive displays (lenses). In addition, there is a museum-wide app, ArtLens, and at the lobby entrance to the space is the Beacon, a 4-by-4 array of 55-inch Edgelit 1080p LED displays. It plays a looping, non-interactive program displaying both dynamic and pre-rendered content. The six interactive stations collectively known as "lenses" featured touch screens that allow visitors to discover information about related artworks placed nearby, as well as engage in unique interactive activities. While all lenses share a similar home screen layout, each possesses its own theme related to the artwork on display. Information is provided in a question and answer format, and hotspots allow visitors to find out additional information by touching specially designated areas. Additionally, the touch capability of the lenses allows visitors the opportunity to have interactive viewpoints that would not be possible in a traditional gallery setting, such as a view of the back of a bowl or the opportunity to zoom in on a painting.

2. TAMSCHICK MEDIA+SPACE, TING, Norsk Teknisk Museum, Oslo
https://www.youtube.com/watch?v=Usj7VOTcYRg

Visitors pass through different zones while moving through the exhibition. The entrance shows illustrations of eight objects representing the technologies to be discussed in the upcoming TING debates, combined with contradictory quotes reflecting on the relationship between technology and democracy. Each visitor gets a basic wooden block, which, analogue to the digital pixel, becomes a haptic tool to trigger digital interactions within the exhibition and to cast their votes within the TING.

This case is about connecting spaces and how we can connect people in the future. Body is the interface. Live presence, telepresence, virtual presence, avatars, wearable computing. What is next for collaborative sharespaces (to modernize your intranet by embedding social and collaborative features)? The next decade is about the convergence of technologies and natural human needs for collaboration, co-working, merging, sharing. Hypersensory self: collective reality is a large scale installation, we move in a group and the visuals are reacting with us and are being generated more and more.

3. Sensitive Cities, Shanghai, Italian Pavillion, EXPO, 2010

http://www.studioazzurro.com/index.php?com_works=&view=detail&work_id=88&option=com_works&Itemid=22&lang=en

Sensitive City employs ICT to create a highly immersive space able to relocate visitors in other cities and to make them interact with their citizens. The idea follows in the wake of the great tradition of imagined cities, from Tommaso Campanella's City of the Sun to Italo Calvino's Invisible Cities. However, this city is not meant to last as a doubtful model or a mere literary creation; it is ideal because it is not there yet, but it could be in the future. Syracuse, Matera, Lucca, Chioggia, Trieste… Users cannot ask specific questions or browse information. They can just decide which storybearer to stop and how long to listen to him or her. The project is not exactly educative or informative but aims to make visitors get a glimpse of the portrayed cities and their citizens. Used: 11 videoprojectors, 2 Mac Pro, 7 Mac Mini, 4 Holopro screen, 6 scenery flat, interactive sisytem using IR camera.

4. Miraikan,National Museum of Emerging Science and Innovation, Tokio, Japan, 2001 – ongoing

http://www.miraikan.jst.go.jp/en/aboutus/

Miraikan is a place of exhibitions that provide people with a chance to enjoy hands-on contact with science and technology, Miraikan's colorful line-up of offerings includes the latest technologies, the global environment, space exploration and life science. At the 6F 112-seat spherical theater, the hemisphere will fill the screen and dynamic images can be experienced A 3D dome movies which seamlessly fuses live action scenes, mesmerizing CG, and latest techniques of scientific data visualization and guides you through the esoteric world of theoretical physics.

5. Adler Planetarium, Chicago, USA

https://teq4.com/the-future-of-domes-a-trilogy/
https://en.wikipedia.org/wiki/Adler_Planetarium/
http://www.giantscreencinema.com/MemberCenter/DIGSS/DIGSSForum/DIGSS11DomeSpecs.aspx

The Adler Planetarium is a public museum dedicated to the study of astronomy and astrophysics. It was founded in 1930 by Chicago business leader Max Adler. The Adler Planetarium, is probably the only true 8K dome ever built (at least for public presentations). Each pixel is only 1.3 arc minutes across, very nearly equivalent to 20/20 vision resolution. It uses 20 super-duper high-contrast projectors called Zorro which can display a true sequential contrast of 1,000,000:1. That means it can project black. This unique combination of very high resolution, very high contrast, and the shape of the dome means that most of the time you can't see the screen. Or at least can't determine where the screen is, and therefore it simply disappears. Moving the content around by two axis of motion you got 3D without the glasses. About $5 million was spent on the technology and the very seamless Spitz screen.

6. Global list of Planetariums and Digital Dome Theatres

http://www.fddb.org/organization-types/dome-theatres/

Domes are the future, places for good content. They allow us to stay together physically, and to be together and also to connect with remote spaces and still stay in the group. We will see the interaction and convergence of many textures and bodies in collaborative sharespace. No wires, no wearables, no attachments. The user is the creator: experimental narratives puts users at the centre of the interaction. Structured improvisations take place in these special places between a maker and

a user. Interaction needed for continous community involvement, numerous touch points. Intra-active points are the future; we are collectively networking, and physical and virtual worlds are blending and merging. Quality creation, dissemination to enable us to have a blend of virtual and a positive human sensory experience. Physical intimacy is also very important, and we shouldn't put the virtual ahead of the physical.

How will museums of the future look?

7. ALiVE projects:

http://alive.scm.cityu.edu.hk/about-alive/

ALiVE promotes an integrated scientific and artistic research strategy. Domain specialists work together to create unique technological and content rich solutions for cultural and industrial applications in the public domain. Prof. Dr. Sarah Kenderine creates powerful interactive experiences for museums—pioneering new possibilities for visitors' engagement using emerging technologies. In widely exhibited installation works, she amalgamates cultural heritage with new media art practice through interactive cinema, augmented reality and embodied narrative.

8. ECloud with Pure Land, Hong Kong, 2014

http://alive.scm.cityu.edu.hk/projects/alive/ecloud-with-pure-land/

ECloud with Pure Land immerses visitors in the quintessential UNESCO World Heritage site of Buddhist grotto temples, an art treasury abounding with murals, statues and architectural monuments, also known as the Caves of the Thousand Buddhas located at Dunhuang. It was a gateway to and from China on the ancient Silk Road, which carried trade between China, western Asia and India from the 2nd century BC until the 14th century AD, for over 1000 years.

Visitors are immersed in 3D experience in a custom designed 13.6 meters wide 5 meters high 3D projection environment that gives a true-to-life experience of being inside a cave temple Cave 220 and seeing its magnificent Buddhist wall paintings at one-to-one scale. Figures and objects in these paintings are dramatized by means of spectacular interactive 3D animations and digital effects. Taking advantage of 4K projection and 5.1 surround sound system, ECloud with Pure Land demonstrates a powerful situated exhibition. Currently, ECloud with Pure Land is installed at Hengqin Creative Culture City in China.

9. The Hong Kong Martial Arts Living Archive, Hong Kong, 2014

http://alive.scm.cityu.edu.hk/projects/alive/hk-martial-arts-living-archive/

The Hong Kong Martial Arts Living Archive is a collaboration between the International Guoshu Association Hong Kong and CityU. The project encompasses the first-ever comprehensive digital strategy of archiving and annotating a living kung fu tradition using state-of-the art data capture tools. In addition, this archive will become the wellspring of exhibitions and installations that promulgate rich cultural traditions. The archive, with comprehensive metadata, descriptions and physical annotations will also be a vital source of ongoing research. It is a groundbreaking project to develop a sophisticated methodology for the complete 4 dimensional analysis of Martial Arts applicable to numerous other performance-based activities. It builds upon extensive work done in dance annotated. The Martial Arts Living Archive will provide benchmarks in the formation of extensive analytics tools and intangible heritage documentation. Work has begun on this project at

ACIM, with motion capture of some of Hong's Kong's renowned Kung Fu masters having been done in its leading edge MOCAP Lab.

10. The Science Museum/Wonderlab in South Kensington, London, UK, 2014

https://www2.le.ac.uk/departments/museumstudies/rcmg/projects/participatory-collaborative-and-co-creative-practices-at-the-science-museum/participatory-collaborative-and-co-creative-practices-at-the-science-museum

The Science Museum/Wonderlab in South Kensington, London, UK, attracts over 2.9 million visitors, and around 12 million online visitors each year. This research project was commissioned by the Museum to recognise the significance of a number of projects carried out by the Museum around the development of the new gallery that sought to be participatory, collaborative, and co-creative in nature. By drawing on current thinking and trends within museum practice more widely, and utilising key illustrative examples from the sector, this research helped to inform future decisions and practice within the Science Museum.

11. Seeing I
not available yet

A presentation of the VR experimental project by an artist wearing the VR goggles for 28 days and pads and experiencing the »life« of the other.Technical challenges of real to VR. He will experience no human interaction beside his own, it will be a kind of mixed reality – he will be doing all the things that the narrative of the »other« will do. It covers a big area of challenges of VR: how to capture the content, accurate representations of space, VR motion capture, how to move and what the controllers could be? Important element to be observed: VR is a complete isolation! This is one of the main ethical questions of Mark's project. What could the consequences be after experiencing 28 days of isolation in a VR headset? Keeping an eye on ethical use of the new tools.

12. Art Passport App from GalleriesNow, 2017

https://fadmagazine.com/2017/10/04/view-art-in-360o-vr-with-the-new-art-passport-app/

ArtPassport is a free app that offers anyone, anywhere, access to high resolution images and 360 degree panoramic views of contemporary art from the world's leading galleries and art museums. The deceptively simple app presents a regularly updated feed of exhibitions with panoramas, images of individual works, descriptive texts on the artists and visitor information. Users can zoom in on art they are interested in and press a Virtual Reality icon to use a Google Cardboard headset for a more immersive experience. Conceived by two galerist; they want to bring the art exhibitions into peoples living rooms. So many art exhibitions are around the town, we make the app for u to see them all through goggles. We want to bring down the walls. Brilliant example of how a single commercial app could be brought into the museum arena.

13. ArtString App

https://www.artstringapp.com/

ArtString is a smartphone app designed to transform museums into spaces of shared human experience. It's designed to enrich the visiting experience by creating a digital space where visitors can share with each other their reactions, knowledge and unique interpretations of the artworks,

encouraging loud conversations in the museum's contemplative galleries.Through ArtString, visitors are also invited to follow 'strings' created by other users, remixing collections and placing the objects and artworks in new contexts. It is conceived by a designer, who engaged mentors in Smithsonian museums, so it is an overlapping amongst artists, entrepreneurs and museums. It can create an user generated tour just by looking at portraits. Bridging the Gap between Museums and Technology providers.

14. New Inc., New York, USA, 2014 – on, an incubator

http://www.newinc.org/
http://www.newinc.org/news-posts/profile-yago-de-quay-2017/

An experimental initiative of the New Museum, New York, NEW INC is a shared workspace and professional development program that brings together over 100 cultural practitioners and creative entrepreneurs, including anchor tenants Rhizome and Columbia University's GSAPP Incubator. The operation occupies eight thousand square feet of dedicated office, workshop, social, and presentation space, and each year selects an outstanding interdisciplinary community of one hundred members who are investigating new ideas and developing sustainable practices. Despite the name, it isn't strictly an incubator in the traditional tech startup sense. There's no equity involved, and the project is designed to be a standalone non-profit. Instead, New Inc wants to replicate the development programs of a startup incubator, bringing in speakers and events, letting tech, art and design cross-pollinate into something larger and stranger. And with a reported $2 million in funding behind it.

Incubator is a place where companies can apply to get space and support, office space, facilities, mentors, industry people to help them. the museum's competing with at least half a dozen other New York institutions, that also means staying ahead of the pack with digital art and ambitious open installations. But while the museum tries to keep pace with a frenetic art world, one of its most ambitious ideas has overflowed the boxes and ended up in a non-descript building just to the south.

15. Australian Centre for Moving Images, Melbourne, Australia

https://www.acmi.net.au

Permanent exhibition Screen Worlds Explores historical and cutting edge moving image forms in the interactive and immersive permanent exhibition.

16. ACMI X, co-working space, 2017

https://www.acmi.net.au/acmi-x/

Industry engagement and collaboration at the dynamic co-working space. Curators, programmers, producers and administrators in a 60 seat co-working space dedicated to the creative industries. Designed by award-winning architects Six Degrees, ACMI X is a 2,000 square metre state-of-the-art office space in the heart of Melbourne's arts precinct and a first for an Australian museum.

Established to provide a home for Melbourne's creative practitioners, ACMI X is a co-working space that assembles a mix of filmmakers, digital and visual artists, digital producers, web developers, screenwriters and designers. It is fostering a creative culture, collaboration, innovation and sustainability.

By providing infrastructure and a community platform that enables discovery, learning and growth

for individuals and businesses alike, creative fusions and cross-disciplinary partnerships emerge from the energy and collaboration between co-workers and ACMI's own creative employees.

17. The idea of museums investing in startups represents a paradigm shift.

https://techcrunch.com/2017/01/02/museums-startups-and-accelerators-oh-my/

Startup accelerators have become an integral part of helping early-stage companies build, fund and bring to market new products and ideas. Countless startups wielding unicorn-status valuations can credit their rapid progress and success to programs like Techstars, Y Combinator and other seed accelerators. These programs run early-stage teams through a three-month bootcamp, infusing them with capital, space, resources and expert mentors to push them to "do more faster" and "make something people want."

18. ACMI Xcel Accelerator, 2016

https://www.acmi.net.au/acmi-xcel-accelerator/

Creative technology in a combination with cultural entrepreneurship. A business accelerator specifically designed for creative practitioners and startups. ACMI Xcel upskills in the startup methodology, including growth marketing, design thinking, customer validation, product testing and sales. The program is open to makers of creative technology and creative products that have a connection with the moving image, including: virtual reality, augmented reality, robotics, digital media, games, interactive content, wearable technology etc. ACMI Xcel is looking for practitioners and small business teams committed to developing scalable creative technology in the cultural industries. Knowledge about the start-up landscape is not required, but enthusiasm is.

19. Mahuki, Innovation powered by Te Papa, New Zealand, 2016

https://www.mahuki.org/

In 2016, Te Papa, the national museum of New Zealand, launched Mahuki to accelerate local startups focused on the cultural sector. From the 34 applications, 10 companies were selected to take part in the museum world's first-ever accelerator program. One of the museum's goals is that these batches of creative teams could help Te Papa address and solve some of their challenges. Each company received NZ$20,000, as well as access to the museum's experts, collections and visitors in exchange for a 6 percent equity stake.

20. Shop at the Contemporary Arts Center, New Orleans, USA, 2017

https://theshopcac.com/

Located in a historic former warehouse that now houses one of New Orleans' most important cultural institutions, The Shop at the Contemporary Arts Center features over 40,000sf of artful co-working space for the creative professional. Professional offer, convenient prices.

21. Hothouse at the Minneapolis Institute of Arts, 2016

https://www.artsjournal.com/speaker/2014/07/announcing-hothouse-exploring-new-ideas-in-co-working-with-the-minneapolis-institute-of-arts/

One of the largest art museums in the United States, started to experiment with the concept of coworking. Although the program seem to have faded away, the museum has a "Venture Innovation

Director" — a first-of-its-kind role, and one that lives on the leadership team. Hothouse explores whether and how the museum can foster a creative co-working space that is inspired by the museum's collections, capabilities, and setting but operates independently as a lively incubator and convener. The pilot will demonstrate newways the museum can use its assets, including its facilities, collection, and staff, for imaginative new civic purposes, and will encourage civic connectors and animators to draw on the museum's resources. There are obvious synergies between museums and tech companies. Some startups have some level of alignment and already have deep partnerships with art museums.

22. Artsy, based in New York

https://www.artsy.net/about/the-art-world-online

Artsy features the world's leading galleries, museum collections, foundations, artist estates, art fairs, and benefit auctions, all in one place. Our growing database of 800,000 images of art, architecture, and design by 70,000 artists spans historical, modern, and contemporary works, and includes the largest online database of contemporary art. Artsy is used by art lovers, museum-goers, patrons, collectors, students, and educators to discover, learn about, and collect art. Promoting the collections, shows, and educational programs of the Musée du Louvre, J. Paul Getty Museum, Robert Rauschenberg Foundation, and over 600 major museums and institutions worldwide. Cloud-based Content Management System (CMS) to update a website 24/7. Analytics via email each month. To list limited editions and original artworks for sale to benefit a nonprofit. It is free for nonprofits to promote Shows and Collections. A museum that invested in Artsy would likely be ecstatic to see an art-focused company that went on to raise more than $50 million and become a market leader.

23. Cuseum, the museum engagement platform
https://www.cuseum.com/

Mobile apps or digital membership for museums, public attractions, and cultural institutions. Cost-effective platform provides with a suite of tools that drives deeper visitor experiences, members acquisition and retention. The platform provides everything needed to tell a story and delight the visitors. 100 museums involved. Cuseum is issued of United States Patent No. 9,775,003 related to a method of delivering content based on activity and location. Cuseum continues to strengthen its position as a driver of innovation in the museum and nonprofit sectors.

24. Electric Objects, 2015-2017

https://www.electricobjects.com/

The Electric Objects App has been acquired by GIPHY. A bittersweet milestone — after four years, they have decided to shut down the Electric Objects hardware business. While GIPHY will not sell or support new Electric Objects hardware, they are committed to maintaining the EO App for existing customers.

25. Estimote, 2015
https://estimote.com/

The physical world defined by software. People and assets can be located programmatically. The Guggenheim app provides you with contextual information, and Estimote beacons surface this information as you walk through the space. The app includes everything from text, to images, to audio and video guides about both the Guggenheim structure itself and the artwork housed within.

25. BLVD

http://blvrd.com

Bringing the arts to life through innovative VR technology. Boulevard is reshaping the landscape of storytelling and revolutionizing the way the world looks at art and culture. Boulevard partners with the world's leading museums to share their collections through VR technology and leading-edge interpretive modes. Boulevard is working in parallel with the growth and development of industry leaders including Oculus, Samsung, Sony, HTC, Google, Microsoft, and others. As they say: "We are hardware agnostic so that our content-rich museum experiences can be used on any HMD." Here is the link to presentation of some current projects.

Take students on virtual trips and access the world's great art collections and cultural sites from your very own classroom through Boulevard. Their VR experiences complement education curriculum across disciplines and open up new possibilities for learning.

26. WITHIN
https://with.in

WITHIN is a place for innovative, entertaining, and informative story-based virtual reality. They bring together immersive experiences from the VR creators—from gripping tales set in worlds of pure imagination to documentaries taking visitors further inside the news than ever before.

WITHIN supports all major headsets, including Oculus Rift, Samsung Gear VR, HTC Vive, Sony Playstation VR, and Google Daydream.

To get started experiencing their content, download the app for iPhone or Android.

Article about WITHIN.

27. Heritage users to co-create stories using VR Tilt Brush , Google
http://store.steampowered.com/app/327140/Tilt_Brush/

Tilt Brush by Google is a software that allows 3D painting (simulation of painting with a brush) using VR headset and motion- and location-sensing controller. In terms of interaction enable user/participator to paint in 3D space, as well as visitor/attendee to be a part of a 3D painting in its progress. Some examples:

Google Cultural Institute in Paris:

https://www.youtube.com/watch?v=91J8pLHdDB0&feature=youtu.be

Louisiana Art & Science Museum: Art After Hours: The Art of Animation in Gaming & Film:
https://blog.turbosquid.com/2016/07/21/a-night-at-the-museum-with-virtual-reality/

28. Openspace 3D

http://www.openspace3d.com

Watch the presentation video.

OpenSpace3D is "Free software" for Virtual and Augmented Reality projects development. Their goal is to democratize real-time 3D applications and provide a tool for all creative minds, not just developers. Users can download the software OPEN SPACE 3D for creating virtual environments, augmented reality and specific presentations of imaginative or real spaces. The platform supports and incorporates HTC Vive, Oculus and Google Cardboard applications.

OpenSpace3D supports two augmented reality techniques to make AR applications. The feature marker detection that allows to detect an image on the camera and the Aruco fiducial marker detection that allows to make fast applications with several markers and also use them as a tangible interface. More about augmented reality usage can be read here.

One of the great things about OpenSpace3D is it's native support for several Virtual Reality and Input devices : the Leap Motion for hands tracking, the Myo armband for gesture recognition, the Neurosky headset for concentration and meditation or the Emotiv Epoc for EEG signals, the Nonin Oxymeter for heart pulse, HTC Vive, Oculus and Vuzix for VR, the Tobii EyeX for eye tracking, or any serial devices that support so you can play with Arduino and any device and tracking system compatible with VRPN. Once completed, the virtual reality application can be easily exported for Windows, Mac, Android, Linux and iOS.

29. MyMiniFactory – The 3D Printable Object-Sharing Platform

https://www.vi-mm.eu/2017/08/16/myminifactory-the-3d-printable-object-sharing-platform/

MyMiniFactory, which launched in 2013, is curated social platform for 3D printable objects. As they say:"Think of us like the YouTube for 3D printing."

One can find tens of thousands of 3D designs ready for download for free. These will work with any desktop 3D printer, and the MyMiniFactory team have tested every single one so to guarantee a quality print. MyMiniFactory's values center around quality and openness: quality with curation to assure all the models are printable, and openness with free downloads on all printable objects.

Scan the World is an ambitious initiative (part of MyMiniFactory project) whose mission is to archive the world's sculptures, statues, artworks and any other objects of cultural significance using 3D scanning technologies to produce content suitable for 3D printing. Through 3D scanning and 3D printing, Scan the World serves to bring art to the masses in a way more tangible than ever before, all in the wider context of meaningful contribution to education, preservation, restoration and accessibility.

The platform offers uploads for registered users free of charge, so museums and galleries could disseminate delicate works of art in 3D form to wide public, wether for archive, research, study or just enquiry purposes. Sharing the 3D models online also means easy access for interested audience that may boost museums attendance in the future.

The short presentation of Scan the World platform can be found here.

This is like a short-cut to something useful – if you want to find something this is a competition for

museum shops.

30. SKETCHFAB

https://sketchfab.com/
https://sketchfab.com/virtual-reality

Sketchfab – is a community where one can upload models that can be adapted. A lot of museums are using it. Davide attended the conference where they embeded 3D models to create games.

A lot of institutions that are working with Sketchfab – it could be considered a tool, it is a way of sharing »the back side« of museums. Sketchfab is empowering a new era of creativity by making it easy for anyone to publish, share, and discover 3D content on web, mobile, AR, and VR. With a community of over 1 million creators who have published over 1.5 million models, they are the world's largest platform for immersive and interactive 3D. Its technology is integrated with every major 3D creation tool and publishing platform, and is compatible with every browser and most VR headsets. Its player is embeddable anywhere on the web, and lets you view and share 3D and VR content on social media such as Facebook, Twitter or Reddit. View ANY Sketchfab models in virtual reality from the web, by clicking the VR button.

31. OPENGLAM

https://openglam.org/

Galeries, libraries and museums – well known example. Open access to cultural heritage. Digital collection that can be freely used and distributed. The principle behind is open, use for free, and easy access. OpenGLAM is an initiative run by Open Knowledge that promotes free and open access to digital cultural heritage held by Galleries, Libraries, Archives and Museums. Supported also by European Commission. Galleries, libraries, archives and museums have a fundamental role in supporting the advance of humanity's knowledge. They are the custodians of our cultural heritage and in their collections they hold the record of humankind. The internet presents cultural heritage institutions with an unprecedented opportunity to engage global audiences and make their collections more discoverable and connected than ever, allowing users not only to enjoy the riches of the world's memory institutions, but also to contribute, participate and share.

The first step to make a collection open is to apply an open license, but that is where the story begins. Openness to collaboration and to novel forms of user engagement are essential if cultural heritage institutions are to realise the full potential of the internet for access, innovation and digital scholarship.

32. RIJKSSTUDIO
https://www.rijksmuseum.nl/en/rijksstudio

One can browse through 618.913 works of art and 377.220 Rijksstudios. Rijksstudio contains 125,000 beautiful, well-known, and surprising images from the Rijksmuseum's collection. You can zoom in really close, share them, and 'like' them. You can also create collections of your own, using your favourite images and details. Not only that, but the Rijksmuseum is also inviting you to use these images to create beautiful products. Rijksstudio is an innovative digital application that makes a large part of the museum's collection available to all, absolutely free of charge. Well- and lesser-

known pictures can be examined in close detail. Users can interact with them, "like" them, share them with others and use them in any way they wish. Rijksstudio is a unique project by virtue of the quality of images, interaction with the public, and concept of "closeness" forming the guiding principle of Rijksstudio, which is borne out at various levels. In practice, this entails:

A focus on the image.

High-resolution images (2500 x 2500 pixels, 300 dpi) which are of real value to the user. The Rijksmuseum now allows free use of 125,000 high-quality digital reproductions, with absolutely no limitations. These are not "thumbnails," and there are no watermarks or sharing restrictions.

Rijksstudio invites the public to enjoy and explore the images: zoom in, save, manipulate, and share. Users are encouraged to download the images and to do something—anything you like—with them. The Rijksmuseum is "democratizing" its collection.

An "ambassador campaign" has been launched to promote Rijksstudio. Well-known artists were asked to produce a work inspired by the Rijksmuseum's collection. A real-world pop-up Rijksstudio visits locations such as the De Bijenkorf department store, where visitors are invited to produce their own artwork.

The new Rijksmuseum website and Rijksstudio have been developed according to the principles of an app. The priority is ease of use and control, whereby all tasks can be undertaken with a minimum of user interaction. Touchscreen control, inspired by iPad apps such as Guardian Eyewitness, in which the full-screen image is not obscured by information or function buttons, is new to the museum world. The website is also fully responsive: it works well on (almost) all devices.

We also think that "immersive storytelling" that combines different technologies and techniques for the benefit of users (mentioned at the Museums and the Web conference) is the vision ahead for museums.

33. EUROPEANA

https://www.europeana.eu/portal/en

We always forget we have this large repository of things, where we can get materials, HD images, already there. So since it is there, we should include it also. It is a great collection, but is it a tool, a collection, or example of collaborative projects. Explore 51,354,016 artworks, artefacts, books, videos and sounds from across Europe. As they say, they transform the world with culture and want to build on Europe's rich heritage and make it easier for people to use, whether for work, for learning or just for fun. This is exactly the tool for museum that can move them towards VR/AR.

Repository to get HD images for implementing something else. Everytime we need to take images from other sources, we invent the wheel. It could be a tool that is opened up to society to create tools that wil give access to this things. Something that can be used to create tools. In this case, u will not have an access to the things it is a digital accessable metadata, but you can't have it privatly. Some of them have public domain, then u can use it for free.

34. Dun Huang Cave of China - VR
https://www.youtube.com/watch?v=vC1NlPJiD0w
http://mogaocaves.xyz/

Augmented and VR reality. Hong Kong Universtiy is involved in a lot of projects from multiple different parties. Interactive VR experiences: several projects, pilot projects. Similar aproach to several other cultural heritage sites. More like a crowdsourcing. Dunhuang Caves in northwest China began offering a digital way for people to experience the Buddhist grottoes.

The Digital Dunhuang (www.e-dunhuang.com) launched by Dunhuang Academy offers virtual views of 28 of the Mogao Grotto caves, a UNESCO World Heritage Site. The website features photos, video clips, archive materials and a 360-degree view of the millennium-old caves located in the desert of Gansu Province.

35. TIMESCAPE

http://www.hiverlab.com/timescape.html
https://youtu.be/4x6CC7BjwFY

The world's heritage sites are facing constant risks from numerous natural and human factors which could damage the sites irrevocably. In collaborations with world-leading scholars and research institutes, Hiverlab officially initiated Timescape in June 2016, a long-term independent project using immersive technology and storytelling techniques to showcases and promotes the world's heritage sites for the purpose of education. Timescape aims to create a four-dimensional multi-user interactive virtual domain where users can maneuver across space and time, not just different places of the same era but also the same geographical space over time. Viewers can see how history has changed buildings, paintings, sculptures, cultures, and people's lives. As they say, they strive to make Timescape a legacy which could be passed down across generations globally.

Interactive visualization based on the 3D model, they tried to integrate the archive photos into VR. Based on pictures taken by historians. Trying to combine 3D photos with archive ones. This is just one of the projects they are doing in Asia. Also for Discovery channel.

36. CYARK – Preserving cultural heritage at risk
http://www.cyark.org/
http://www.cyark.org/projects/

CyArk brings global heritage to life and gets you closer than ever to the sites you've always wanted to see. CyArk was founded in 2003 to ensure heritage sites are available to future generations, while making them uniquely accessible today. CyArk operates internationally as a 501(c)3 non-profit organization with the mission of using new technologies to create a free, 3D online library of the world's cultural heritage sites before they are lost to natural disasters, destroyed by human aggression or ravaged by the passage of time.

CyArk uses cutting edge technology to capture detailed 3D representations of world's significant cultural heritage sites before they are lost to natural disasters, destroyed by human aggression or ravaged by the passage of time. Production team takes all the data collected by the field team and turns it into useful products for their various stakeholders. Over the last 6 months they have been doing a lot to update their production pipeline to produce a variety of outputs that enable the conservation, recovery and discovery of cultural heritage.

37. Iconem

http://iconem.com/

http://syrianheritagerevival.org/

Iconem's ambition is to preserve the knowledge of threatened heritage using digital advances. Thanks to our ground surveys and our visual processing algorithms, we are able to produce real digital doubles of archaeological remains or expanses. We hence offer the scientific community and the public an innovative means of exploring famous places of world heritage. For sites under threat of disappearance, our technology guarantees that, whatever happens, the archaeological knowledge will be preserved. By scanning today the sites which are under threat of disappearance tomorrow, we are working to preserve a common asset and we are ensuring its transmission to future generations.

Syrian culture is our common heritage. We are losing it. What can we do to preserve this culture for future generations? Documentation can't wait! Iconem sends specialists to support Syrian archaeologists and architects by providing them with advanced techniques to document their heritage. They organise missions in the field using the latest technology in order to create a digital database of Syrian monuments and a national team able to provide data for it. Because saving the knowledge of this history is our common duty. NGO company. A lot of digitalization, for collaborative projects. Using new technologies to create 3D libraries.

38. REALITIES – EXPLORE REAL PLACES IN VIRTUAL REALITY

http://realities.io/

Realities lets you explore a growing library of interesting and mesmerizing places from all around the globe in virtual reality that are explorable in photorealistic quality. Travel to places that were out of reach before, e.g. famous tourist sites, archeological and cultural heritages sites and lost places. Most of their scans are based on photogrammetry, but they also use other scanning techniques like LiDAR when necessary. Currently the platform only support HTC Vive, but Oculus Rift support will be added soon. Further you need a computer fullfilling the recommended specs for VR (Intel i5 / 4GB RAM / GeForce GTX 970 or equivalent). Realities is free! It is part of thier vision to enable as many people as possible to travel to awesome places. They just launched a pilot program in which they work together with selected content creators from around the world that are interested in scanning interesting locations. If you have a background in (panorama) photography and/or film-making, often end up in cool & interesting places and are interested to create photogrammetry content, you can apply for their pilot program here. Currently, Realities are focused on developing Realities as a platform and therefore they don't do scanning for other partieas. If they do a scanning project for a third party, those scans have to be available as interesting content for the Realities platform as well.

39. Forbidden City of China VR experience

https://www.youtube.com/watch?v=EAMV17uFun8

https://www.oculus.com/experiences/gear-vr/1110609692373708/

https://vrrv.tv/

Photon Interactive was founded in late 2015 in Beijing, China. They are a tech company providing engine service for VR interactive content-development teams, with pilot product Photon Engine specializing in VR interactive film creation. They have developed VR-specific narrative approaches: prioritized are the aim to enhance immersive experiences for viewing and dedication to interactive approaches that suit audiences' innate viewing habits. As a result, they have created a series of innovative tools that are effective, user-friendly and low cost. They wish to tap on the creativity and imagination from all artists and welcome you to upload the work you created to all VR content platforms.

40. The J. Paul Getty Trust
http://www.getty.edu/about/

In 2009, the world's wealthiest arts institution, took a gigantic hit. The value of their endowment declined more than 25 percent in a single year. Their "alternative investments," including that of venture capital, faced criticism and management shake-ups; layoffs and budget cuts ensued.

41. Metropolitan Museum of Art
https://www.metmuseum.org/

The Metropolitan Museum of Art, the largest museum in the United States. Over the past few years, the museum significantly expanded their staff and overexerted itself in a variety of areas, including emerging technology. "Digital investments" were one of the areas facing scrutiny; this summer, The Met abruptly slammed on the breaks in the face of an estimated $10 million deficit.

Future in Mind, SWOT Analysis

How can technology be financed? How to create a "benefits plan, a business plan for non-businesses, e.g. not-for-profit institutions like museums"? As this scheme is new to most museums, it needs some more consideration here. The idea of a business (or benefits) plan is to determine the financial viability of an undertaking.

Before putting figures to it, it is worthwhile to do a SWOT analysis.

STRENGTHS

- original artifacts, VR can open this space
- VR is immersive (wow effect)
- social VR
- mixed reality
- business opportunities
- EU help, EU platforms for grants for new media

INCUBATORS/ACCELERATORS/CO-WORKING

- start-ups can give a new vitality to museums
- potential for a commercial approach
- start local, think global --> (option to)
- take a stake in the companies
- crowdsourcing opportunities, also as a way to involve the general public

WEAKNESSES

- trying to focus too much on technology, not on experience
- objects without »aura«
- museums need education on new media
- VR is singular, isolating experience
- the system is not transparent on how to access the market: for private companies to work with museums and for getting to the decision makers --> hard to "breach the wall" of museums
- difficulty to apply to tenders/bids and to get through
- for EU bids, risk of poor knowledge from evaluators
- it's not easy to go global

OPPORTUNITIES

- museums will need this kind of new media to compete with other fields
- question of interest
- put artifacts in »real world«

THREATS

- »everything new is better«
- expensive technologies
- not the right motivation (collect the money)

● gamification (platform created and sold later) ● think about experience first INCUBATORS/ACCELERATORS/CO-WORKING ● associations to approach the museums ● museums are more locally oriented, ● but the association of museums will ● have a bigger pool of resources (staff,experience)	● cheapest wins ● low quality content INCUBATORS/ACCELERATORS/CO-WORKING ● 9/10 startups fail ● low money gain for startups

AR example: Your project or undertaking is to have a mobile app for your permanent collection developed. You now scrutinize this idea for its strength, weaknesses, opportunities and threats.

STRENGTHS: mainstream technology, easy to use, free for visitors/users

WEAKNESSES: content needs to be adapted for the app and to be downloaded *before* a visit by a user

OPPORTUNITIES: reaching out to new audiences (younger people), conveying information otherwise not available, interlink app with website and on-line shop

THREATS: needs to be permanently technically up-dated to be compatible with new smart phone's versions

Conclusion:

Museums don't traditionally have much access to early-stage investment expertise.

Unless led by experienced startup investors, what is already risky becomes even riskier. With some asserting that an estimated 90 percent of startups fail, that's a tough pill to swallow. To exaggerate the point, now imagine the flavor of an investment going into a company like Theranos. Despite the hype and allure of venture investing, it's been widely reported that the majority of VCs underperform the market. There are plenty of companies already addressing the needs of museums, and the overall downside might be too much for most institutions to bear. None of this is core to the museum's mission. Straying too far from the basics, conceptually and financially, can have a negative impact.

Cultural heritage should collaborate with existing technological platforms, models and already implemented solutions offered online (Google), challenging the boundaries, expand the relevance of museum practices, foster creative cultural production, reinforce the museums as a place for innovations.