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# Transformation
# Immersion
# Storytelling

20 years
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# Content




**Imprint**

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# Editorial

DEAR READERS,
DEAR FRIENDS OF NOUS,

20 years have passed since we implemented our first digital museum guide. In the meantime, we have gone beyond cultural fields with our projects and experience the crossings between culture, business and media in our daily work.

In this issue, we therefore look back and forward at the same time, have conducted interviews with Sarah Kenderdine and Hannes Werthner and invited authors such as Franziska Mucha, Nikolaus Franke and Robert Pfaller to address questions around Digital Humanism, transformed participation and business concepts, computational museology and new visitor typologies in the cultural field.

NOUS has been investing in research and development for years, some projects have become products – like our recently launched immersive 3D audio system NOUS Sonic or our software for 24-hour care, already integrated into its own startup.

In 2022, we took an important strategic step to strengthen our vision – the intertwining of storytelling and technology: NOUS Audio in Berlin is our subsidiary for content creation and production with its own team and a large network of writers and translators.

Great thanks go to Gunther Reisinger, who accompanied this issue as co-editor and Verena Blöchl who took care of the graphic design.

LIEBE LESERINNEN,
LIEBE FREUNDE VON NOUS,

20 Jahre sind vergangen, seit wir unseren ersten digitalen Museumsguide umgesetzt haben. Mittlerweile sind wir mit unseren Projekten über das kulturelle Feld hinausgegangen und erleben in der täglichen Arbeit die wechselseitige Befruchtung zwischen Kultur, Wirtschaft und Medien.

In dieser Ausgabe blicken wir deshalb zurück und voraus zugleich, haben Interviews mit Sarah Kenderdine oder Hannes Werthner geführt und Autorinnen und Autoren wie Franziska Mucha, Nikolaus Franke oder Robert Pfaller eingeladen, Fragen rund um Digitalen Humanismus, transformierte Partizipations- und Business-Konzepte, Computational Museology oder neue Besucher-Typologien im kulturellen Bereich zu thematisieren.

NOUS investiert seit Jahren in Forschung und Entwicklung, aus manchen Projekten wurden eigene Produkte – wie zuletzt unser immersives 3D-Audiosystem NOUS Sonic oder unsere Software zur 24-Stunden-Betreuung, die in ein eigenes Startup eingebracht wurde.

2022 haben wir darüber hinaus einen wichtigen strategischen Schritt getan, um unsere Vision – die Verschränkung von Storytelling und Technologie – zu stärken: NOUS Audio in Berlin ist unsere Tochterfirma für Contenterstellung und Produktion mit eigenem Team und einem großem Netzwerk aus Autorinnen und Übersetzern.

Großer Dank gilt Gunther Reisinger, der diese Ausgabe umsichtig als Mitherausgeber begleitet hat und Verena Blöchl für die grafische Gestaltung.

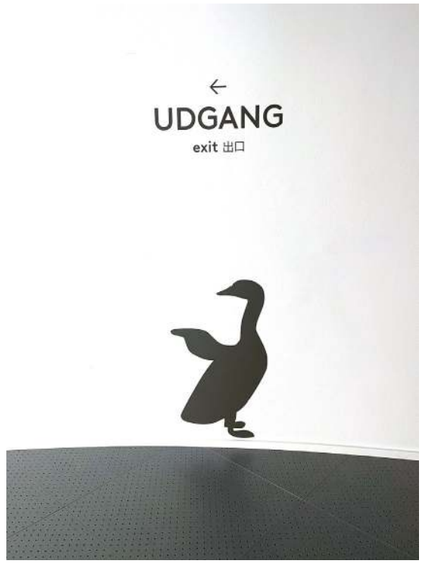
*Wolfgang Schreiner*
*Raphael Schneeberger*
Managing Directors

# Instead of an Introduction

# The Quiet Bliss of Non-Visitors

TEXT Robert Pfaller

## On a frequently neglected benefit of museums and other cultural institutions




It is highly laudable when museums try to reach out to as many sections of the population as possible, offering them incentives and inducements – what we might call appetizers and aids to digestion, aperitifs and digestifs – to partake of the kind of high cultural fare that is not always immediately appealing or easily digestible. After all, if all members of the public are paying for culture, then all members of the public should also participate in its services if possible, and not just that small, well-off, culture-loving section of the population who tend to pay their income tax in Malta or the Maldives anyway, if they possibly can.

However, if assiduous cultural policy-makers and bureaucrats set about evaluating the performance of museums, theatres and other cultural institutions based primarily on the raw number of visitors, then they are overlooking something crucial – just like everyone who tries to assess such ephemeral, not easily definable things such as culture, wit or innovative ideas using the sadly miserably primitive, quantitative criteria of evaluations. Even in the considerably more physical sphere of contemporary football, it has long been recognized that quantitative parameters such as possession of the ball, tackle-rate, pass-rate, number of shots on goal or distance covered tell us nothing about the result of the match. In the arenas of culture and the intellect, unfortunately, we are often still a long way from realizing what football pundits have known for some time.

What is easily overlooked by the exercises in quantification and measurement that are currently so fashionable in the world of culture is something genuinely cultural – namely, that culture consists in large part in maintaining *fictions*.[1] Here we encounter a wonderful paradox: the reality of culture exists primarily in the things and events that feed *the imagination of culture*.[2] We can see this already by looking back into the history of culture. For example, the first houses that humankind ever built were not usually inhabited.[3] As pyramids, temples, cathedrals and palaces, they served instead to maintain a fiction – usually concerning power or religion, or both together. And when people did turn up there, like the apparently pious people of the Middle Ages, for example, the clergy had to insist that they refrain from blaspheming and playing dice at the altar.[4]

We can see this in ritual practices too. People who practised early religions used all sorts of devices to give the impression of religiosity without becoming overly engaged or involved themselves. The philosopher Slavoj Žižek has provided a shrewd description of this general functional principle using the example of Tibetan prayer wheels:

> "You write a prayer on a paper, put the rolled paper on a wheel, and turn it automatically, without thinking (or [...] you attach it to a windmill, so that it is moved around by the wind). In this way, the wheel itself is praying for me, instead of me – or more precisely, I myself am praying through the medium of the wheel. The beauty of it all is that in my psychological interiority I can think about whatever I want, I can yield to the most dirty and obscene fantasies, and it does not matter because – to use a good old Stalinist expression – whatever I am thinking, objectively I am praying."[5]

*"We understood 'involvement' in the sense of 'participation' and concluded that only those who turned up and took part would receive a piece of the cultural pie. But this was probably a mistake."*

© Peter Rigaud

Robert Pfaller

Professor for Philosophy and Cultural Studies, University of Art and Design Linz (AT)

Using a word from recent cultural theory, the principle of these practices can also be described as "interpassivity".[6] Interpassive practices, devices and buildings freed people from demonstrating religious commitment – by creating exactly the opposite impression. It was not the people themselves who had to consume their religion and thus exercise their "passivity" (which consumption is usually regarded as, rightly or wrongly). Rather, their things and events did it on their behalf. People could delegate their "passivity" to such substitutes.

The older the religions were, the more both ritual machines and more monumental factories were used to impress others. This largely freed people themselves from having to engage in activities of religious consumption such as faith. We can therefore say without exaggeration that even during Greek and Roman antiquity – civilisations that are comparatively familiar to us culturally – it was the case that the gods believed in people rather than the other way around.[7]

People only seem to realize that they had to produce their religiosity themselves, by hand (e.g. joining hands in prayer) so to speak, relatively late on in cultural history. This trend contrasts remarkably with the well-known development in the sector of productive work, where, after thousands of years of laborious manual work with minimal use of equipment, human ingenuity finally made it possible for people to delegate their work more and more to machines. Strangely enough, while people in the sphere of economic production increasingly eased the pressure on themselves, in the sphere of religious reproduction (or consumption) they assumed even more responsibility.[8]

But fortunately, in the field of culture, people don't have to do everything themselves. If we did, we would probably descend to the level of a totally amateurish do-it-yourself culture (which, we should note, is not a criticism of DIY-ers or DIY culture, only of its suitability as a universal cultural principle!). In the sphere of bourgeois culture in particular, which in many ways has transferred the pageantry that was once the reserve of religion to the secular world, we still have great ritual apparatuses: state opera houses and theatres, federal museums and state-sponsored festivals and cultural institutions constitute what we might call the battleships and aircraft carriers of an impressive cultural navy; they are flanked by the many semi- and wholly independent institutions of the more or less free cultural scene which we might see as their cruisers, frigates, corvettes, destroyers, submarines, supply ships and sloops.

And so, as a navy maintains a threat, our long-suffering cultural fleet of gross registered tonnage bobs about upholding culture – as a fiction[9] – so we ourselves don't have to believe in culture or know much about it or even go to events. Where would we be if everyone suddenly had to be a passenger or a sailor! But once the fiction of culture is upheld – which is perhaps the most crucial sense of the term "high culture" – we don't have to worry any more, since now we are all as protected by culture as the citizens of a seafaring nation are by their navies.[10]

Culture sallies mightily forth, impressing and convincing others (in the case of the Greeks and Romans it was still their gods[11]). And we just let it run its course, even if we, as Slavoj Žižek speculated, are indulging in our "most dirty and obscene fantasies". It is precisely in this sense that the famous and subtle cultural theorist Roland Barthes once aptly remarked: "I have always liked the theatre and yet I hardly go there any more".[12] That is exactly what theatres do for us; and the bigger they are, the better. We can of course visit them as well, but what matters most is their contribution to maintaining culture as a fiction, which, whatever we do, surrounds us all, as it were, with a gracious, protective and charming veil of sophistication.

In this regard, if we were focusing on the involvement of as many people as possible in culture, and imagined this in the form of personal attendance, we were perhaps somewhat misled by the words. We understood "involvement" in the sense of "participation" and concluded that only those who turned up and took part would receive a piece of the cultural pie. But this was probably a mistake. It's easy to explain – and since we are paying more and more attention to money in culture anyway, we should turn to economics for help on this point too. In this sphere, we see more and more frequently that it is never those who work and take part who end up with major benefits, but rather those who often do not work at all and who never take part at all reap the juiciest returns. This is exactly what we, with all our "cultural capital" should do: we should understand "participation" in the sense of "shareholding"! As such silent participants in culture, we could count ourselves fortunate, whatever we do. As non-visitors, we are indeed profiteers, in the certain knowledge that the fiction of culture will be preserved, and that its benefits will inevitably be distributed in our favour and added to our existing assets.

*"This is exactly what we, with all our 'cultural capital' should do: we should understand 'participation' in the sense of 'shareholding'!"*

## NOTES

1 On the role of fictions in science and culture, see Vaihinger.

2 On this, cf. Marx, 'In this sense all gods, the pagan as well as the Christian ones, have possessed a real existence. Did not the ancient Moloch reign? Was not the Delphic Apollo a real power in the life of the Greeks?'

3 On this cf. also Rudofsky.

4 On this cf. Lacan.

5 Žižek, *The Sublime Object*, 34.

6 On this see Pfaller (ed.), *Interpassivität*; Pfaller, *Die Ästhetik der Interpassivität*; Pfaller, *Interpassivity.*

7 On this issue see Veyne; Deleuze and Guattari, 138; Engels, 14; cf. Pfaller, *Die Illusionen der anderen*, 15–17.

8 On this point see also Villiers de l'Isle-Adam who, however, overlooks the contradictory nature of this development in economics and religion.

9 To a large extent fiction too is a threat. And it works even better as a threat the sooner it manages to remain fiction. See Mladen Dolar, *The Threat* (unpubl. mss). Cf also Žižek, *Absolute Recoil*, 55ff.

10 On this see Freud, 143–44: '…it may be illustrated by the simile of the high confidence a Briton would feel in a foreign land made unsafe by revolt, a confidence in which a subject of some small Continental state would be entirely lacking. The Briton counts on his *government* to send a warship if a hair of his head is touched, and also on the rebels' knowing very well that this is so, while the small state does not even own a warship. The pride in the greatness of the British Empire has therefore one of its roots in the consciousness of the greater security and protection that a British subject enjoys'.

11 A state of affairs that the Christian Church Father Tertullian regarded as characteristic of theatre in general. In his opinion, evenings at the theatre are pagan cultural events per se, even if the audience is unaware of this. He claims you can see it in the architecture (e.g. in the statues of Apollo and the Muses, which can also be found in the Burgtheater in Vienna, for example) and in the figures of speech. Tertullian asks, how do we refer to a famous actress? As a *diva*. Which proves his point.

12 'J'ai toujours beaucoup aimé le théâtre et pourtant je n'y vais presque plus.' Barthes, 1530.

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Tap into

# Navigation.
# Augmentation.
# On/Off Site.
# Guiding.

Culture in the Digital Age

# Computational Museology

**INTERVIEW** Sarah Kenderdine (EPFL- École polytechnique féderal de Lausanne), conducted by Gunther Reisinger (NOUS)

Sarah Kenderdine

Professor of Digital Museology, École polytechnique fédérale de Lausanne (CH)

GUNTHER REISINGER **Let's start with some definitions and terminological clarifications: What is in your opinion digital museology, what is experimental museology and what is computational museology?**

SARAH KENDERDINE Indeed I am progressing towards this concept of computational museology, which is like an whole environment in coding-framework, that connects or could connect all the processes of museum- and exhibition-making, so both are kind of world to the curatorial, semantic ontological world with it's presentation, if you like, or its participatory presentation in the museum domain.

Obviously both of these worlds are networked over the internet and physical. So the conjunction of the physical and digital is an underlying principal of a lot of the work that we are doing. All started out from the birth of the digital object: The birth of the digital object is a major challenge to the traditional curatorial thinking, but it doesn't have to be. A lot of the resistance to digital technologies, which went under the banner of "They're too expensive, so we won't do it", was actually a theoretical challenge, that museum people were not prepared to entertain.

That resistance is beginning to disappear now and I think COVID had an enormous impact on changing the way of museums think about the digital, because suddenly they were forced to negotiate with the potential of digital objects, of digital thinking, of connected thinking.

My laboratory and experimental museology is moving increasingly towards this computational museology: computational thinking is the core rubric of all the teaching at the university which allowed me to dive into these ideas of a complete system's thinking approach to the museum. Once you throw digital in the mix, you have a very powerful ensemble: One of the things that happened in museums which was very pivotal in the way that we can think about them, was in the 2000s the free inclusion of cultural heritage, so this was suddenly grappling with the things that we were living.

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And there is still a deep resistance to understand the affirmative aspects of the digital application: It in itself represented a major challenge to museum thinking: We now have museums that not just show objects, but living systems, living knowledge-systems and systems that are connected to the body and practice.

We know that objects have incredible biographies that are enabled by the digital or by the way they move the object biography: The work that we are doing is trying to grapple with all these layers of complexity. And also at the pivot of new museology, which hasn't been around for a long time, as the visitors in the mix participatory and dialogic experience.

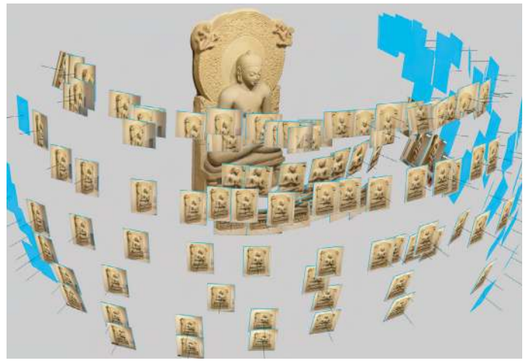
So we are really interested in the use of curatorial knowledge to produce a system, that visitors interact with, that can allow for new knowledge. That builds both on curatorial knowledge but also on the knowledge of the visitor: That's the dialogic experience.

DIALOGIC EXPERIENCE & HYBRID PEOPLE

GR **Do you notice any change in the theoretical approach when you look at the history of museology? How does it impact your theoretical work with your students?**

SK My students actually are all computer engineers, so they are not theorists in the humanities. They are the people that are using machine learning and developing algorithms, they are very orientated in that direction, as a post to the theoretical position. But in our own theorization and those together with my colleagues as a post to the students themselves is this challenge of authenticity and authorship, the new materialities debate, the lessons of digital objects in museums. And then of course we work towards the uses of artificial intelligence and the enablement that they are off.

I think they are well informed about art history but they are not art historians: So we have these hybrid people in the humanities that come out of science and this is really thrilling to work not only with their brilliance but also with the theoretical framework, that we have established in the digital.



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NEW USERS?

GR **There is a strong interaction between media art, computational museology and the discussion on museum KPIs: What is a new user in this digital ages? Is there a relationship between those fields?**

SK What's curious about a lot of the work we develop, even though it comes out of a museological heritage domain, is that it is equally appreciated in a world of media art.

This connectivity between the two or the fact that new art emerges out of these renegotiations of classical heritage often, is partly the ability to engage with new participatory frameworks and new esthetic frameworks, which means it's equally art and media art.

The reason I came to EPFL actually was to take advantage of great engineering in the application to this slightly prosaic domain of digital cultural heritage. That's really about replication and didactics, we move it much more towards the experiential and the open knowledge system.

The ZKM (Center for Art and Media) e.g. has been an amazing promoter for 30 years to bring together these worlds in a new artistic format.

> ***"We now have museums that not just show objects, but living knowledge-systems and systems that are connected to the body and practice."***

GR **What is your opinion concerning a differentiation between born digital and born analogue?**

SK The engagement of the viewer in a digital system is always new, every performance is new. So it is born digital, even if it is an archival work.

Media art often unfolds the time it is received, it's never the same and often it is based on archival material. So it is a new esthetic or acoustic framing of this world. That's a lot of what we are doing: We are creating these new data sculptures if you like.

SERENDIPITY BROWSING

GR **Regarding this ongoing discussion in the museums: What would be your definition of a new user, a digital user?**

SK My work is lightly weighted in the museum galleries: The challenge I often face is the one where multimedia, as it is classically defined, is layers of didactic information in a digital system.

So we produce a system that has no search interface. Curators don't like that, because they cannot use it as an information system, it's more an experiential space, it unfolds according to a kind of desire and association. Even though it is undepending, masses of meta-data and all the curatorial information is embedded in it, but the way that you query is different.

That difference has a lot to do with democratic interface, because the curatorial interface is not democratic, it relies on a lot of prior knowledge and expert knowledge. And if you do not have that knowledge, you will find searches that always repeat themselves, because it is the limit of knowledge.

And we have a digital system where you are responding to the aesthetic or acoustic interest. You don't necessarily know who these artist are, but they are, what you like to listen to: This unfolds in a completely different way. That is a real tension in a curatorial world.

Or we have e.g. an interface which is 100.000s objects from Museums Victoria in Australia. It took 15 minutes to get the data, suddenly you've got access to 400,000 records in 360° across 18 themes, that uses meta-data to make all the relationships, but there is no search function: You can only start somewhere and make associations using the meta-data. The serendipity is browsing, if you like. That creates a real-time curating-machine.

**GR Is it also a methodological question regarding the whole research-approach: Bottom-up versus top-down, to let the archive speak to us?**

SK Yes, because we have classically formed ontological frameworks for this material, this knowledge system thru curatorial meta-data framework. And then we are adding machine-intelligence to augment curatorial data sets. As a result, we have this rich machine-human-intelligence network, which then is unfolded by a user.

**GR You are talking about rethinking also the curatorial concepts within the museums?**

SK Yes, another example of a research project we have now is called *Narratives from the long tail*: It uses over 120,000 hours of video. This applies machine-learning, computer-vision-technology and visual analytics to a massive data set of very important collections.

We work with both: the machine and the curatorial knowledge plus the machine-intelligence together: This moves towards this idea of a computational museology which is a symbiotic type of relationship between what is human knowledge and what a machine can see that humans can't.

## MUSEUM AS LABORATORY

**GR What is the role of engineering, the agencies, which are, in the end, realizing all those projects? To speak a little ironically: Who is guiding whom?**

SK There are two answers to that question: The one of the way in which museums have set up their procurements of technologies of a tender based creative relationship. And then there is the idea of the museum as laboratory where the technologies of today are incorporated. This requires directors who think about digital systems. And it requires curators who are prepared to go there: it's a knowledge retention cycle.

And what I see smartly in the other mode of working: There was more interesting stuff going on in the mid 2000s than there is now. Simply, because the idea now is: We have very complex systems, therefore we don't know anything about them, therefore we must get creative industries to provide this for us. And we don't retain any knowledge about how the systems are built.

We fed them information: How do you breach those walls, how do you bring curators and directors along with their process of the creation of complex systems? It's really fundamental to the transformation of museums towards the digital, because if you don't have people inside the museum who think like that, you will always have products developed that have almost no bearing on the principals of curatorial thinking.

We get the orientation of these systems which hit things like "oh, we are doing participatory work or whatever", without looking at the more profound curatorial issues that are at stake: It was mentioned in the late 1890s at the Smithsonian Institute that the museum of the future would be a cross between the library and the laboratory. These desires make museums more laboratory-like. It doesn't mean experiment equals failures, that's not the cycle I am talking about: I am talking about the ability to think and to experiment with the way that you think.

## TRIANGULATIONS

**GR Maybe one of the possible solutions could be a co-working-process instead of a client-agency hierarchy?**

SK I think the co-working model is a very good model, because a lot of the technologies are emerging. It is not easy for a museum to maintain the infrastructure they require. And in fact that's how I

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***"EU is funding triangulations between the university, the custodian of objects and the creative industry."***

ended up in academia, because I was looking for mechanisms to create infrastructure. To do the experiments we wanted to do in the museum. But access to infrastructure is critical: This is where the universities also have a big role to play.

In the co-curations of things or in the co-working situation, universities are really good at infrastructure. They have suites of computers, they have big-vis-systems. The EU recognizes this funding, that they are releasing, is very much about that triangulation between the university, the custodian of objects and the creative industry together in these hybrid forms. I don't think it's not yet well resolved, I think this is very problematic territory for everybody.

**GR One of the advantages would be that larger digital companies do have the overview because of working with many museums. This would be a possibility to avoid to re-invent the wheel once again.**

SK Absolutely, it's not about reinventing: You do see many things that are reworked.

These relationships are based on trust. That's what's fundamentally important as well, as you can start to become more experimental if you have the trust between the organisations that are working together. I see this with creative industries that are able to help pioneer with museum's more radical solutions, if the basis for trust is there.

**GR Another advantage would be to have a look on this rather new development called Digital Humanism, which is about the relationship between society and technological developments: Could this be an interesting cooperation – a co-working process with the museums, humanistic institutions at their core?**

SK Absolutely, the gallery complex, that I direct, the EPFL pavilion is amplifying for outside-society based on those principals



***"So you can imagine that a museum visit now is hours long, because it's infinite in the way that it permutates."***

of Digital Humanism, rather than Digital Humanities.

It's a very big difference, it also touches the new machine world and the human. It's not about using tools that are digitally enabled, it's about understanding the mechanisms of relationships between humans and machine enabled objects, like IOT, the internet of things, and machine intelligence and what it all looks like. I think Digital Humanism is very spot on.

## SPEAKING ARCHIVES

**GR Let's talk finally about user experiences in the museum: What do you expect it to be in the future?**

SK The way in which curatorial knowledge is held, is augmented. This allows for experiences that are completely unpredicted by the developer of a system. So this is allowing for the unpredictability of outcomes, of curatorial outcomes. Largely they are not unpredictable these days, everybody has a huge amount of control on the systems that they are building and why they build them. So that the user is never lost, but I do see this potential for these new immersing frameworks which are almost a vision of what was intended. This ability to look around the corner – to what was not thought of by the conceivers of the system – this is potentially very interesting.

**GR This is this bottom-up approach: The archive speaks to us, all the curatorial aspect of the AI ...**

SK Exactly, and what does that enable ...

**GR The performative aspects of the archive?**

SK Also, because the mechanisms for engaging with this material inside museum space, is largely what I do, even if it's network based. The systems allow now just infinitely more stuff to be accessed and these are very powerful experiences. So you can imagine that a museum visit now is hours long, because it's infinite in the way that it permutates. Which is interesting for museums that they can build systems that are so rich that they invite multiple visits and that's the holy grail for museums – the ability to invite people back.

To experience the same thing, but infinitely. The richness, that is emerging, is a result of huge digitalisation in museums: The effort of the last 30 years is so fundamental to the next step. However it is archived and however it has traveled from one decade to the other: There are interesting developments, such as the transformation of digital data into synthetic DNA. So that we know we could store this data for 5,000 years and 11,000 hours of video will fit in a grain of sand. We know, that means all the data in the world will fit in a suitcase and then we are able to save it for 5,000 years and decode it and listen to it. These are very interesting phenomena in the transport undergone.

**GR This was a perfect summary of our talk: Thank you very much!**

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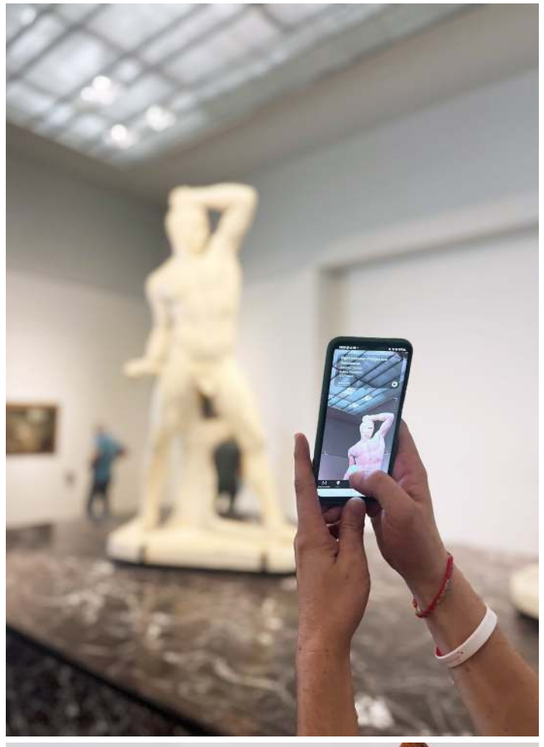
# East West Digital

## Louvre Abu Dhabi

**CLIENT**
DCT - Louvre Abu Dhabi

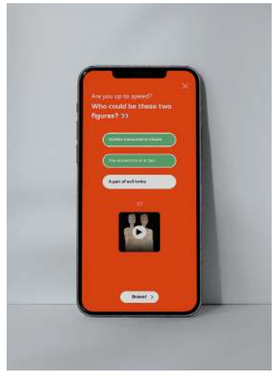
**LOCATION**
Abu Dhabi, United Arab Emirates

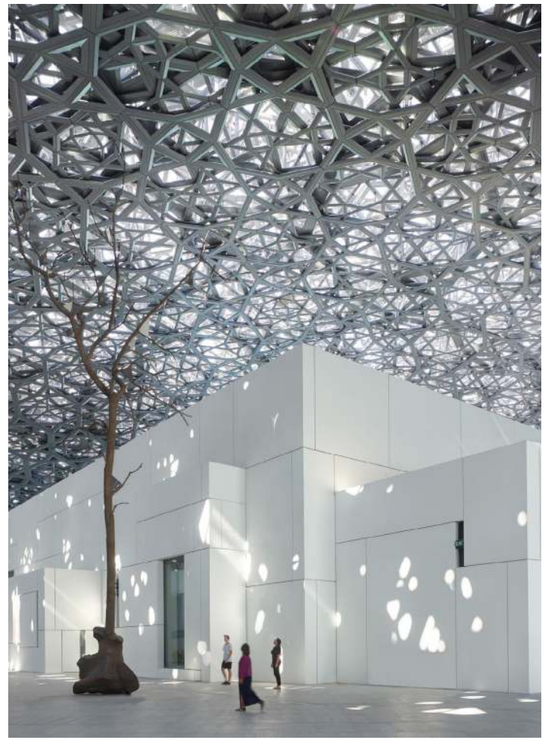


© Louvre Abu Dhabi / Marc Domage

We have been advising the museological team of the Louvre Abu Dhabi on its digital mediation strategy since 2015 and our work for the first universal museum in the Arab World has included the conception and implementation of a media guide, public apps, and a special app for children. Since its opening in 2017, visitors have been able to intuitively explore the impressive institution and its exhibits and receive in-depth texts or audio files on a selection of works as a means of learning more about the history of art and the unique architecture of the museum – all in seven languages. A combination of localisation technology and an interactive 3D map also enables visitors to orient themselves in the museum's many wings. The project's particular focus on inclusion is exemplified by the special mode for people with impaired vision that sets new standards for multimedia guides. Upgraded in 2023, the app is now based entirely on the *bring your own device* concept and new formats such as podcasts have also been integrated. In addition to the navigation function, the app scans all artworks with the support of AI and provides visitors with additional information and audio files. Great importance is also placed on interactivity, with low-threshold mediation games and quizzes inviting visitors to not only learn something about art, but also relate the works to their own lives. The app that we have developed for the Louvre Abu Dhabi is one of the most successful museum apps and can be seen as a reference for the entire Middle East.

Seit 2015 beraten wir das museologische Team des Louvre Abu Dhabi bei der Konzeption und Implementierung der digitalen Vermittlungsstrategie und setzen für das erste Universalmuseum der arabischen Welt einen Medienguide, Public Apps und eine App speziell für Kinder um. Mit der Eröffnung 2017 können Besucherinnen das imposante Museum und seine Exponate intuitiv entdecken, vertiefende Texte oder Audiofiles zu einer Auswahl von Werken rezipieren und so mehr über die Geschichte der Kunst und die einzigartige Architektur des Museums erfahren – dies in sieben Sprachen. Mittels Lokalisierung und der interaktiven 3D-Map können sich die Besucher in den zahlreichen Trakten des Museums orientieren. Besonderes Augenmerk legt dieses Projekt auf Inklusion: Ein spezieller Modus für Menschen mit beeinträchtigtem Sehen setzt diesbezüglich neue Maßstäbe für Multimediaguides. 2023 wurde die App schließlich neu konzipiert und re-designed: Sie basiert nunmehr vollständig auf dem Konzept des *Bring your own device*, neue Formate wie etwa Podcasts wurden integriert. Zusätzlich zu der Navigationsfunktion scannt die App KI-unterstützt sämtliche Kunstwerke und vermittelt den Besucherinnen darüber zusätzliche Objektinformationen und Audiofiles. Weiters wurde großer Wert auf Interaktivität und niederschwellige Vermittlung gelegt – Games und Quizze laden den Besuchenden ein, die Werke in Bezug zur eigenen Lebensrealität zu setzen – abseits von kunsthistorischem Wissen. Unsere Entwicklung für den Louvre Abu Dhabi ist damit eine der erfolgreichsten Museumsapps und kann als Referenz für den gesamten Mittleren Osten gesehen werden.



© Louvre Abu Dhabi / Roland Halbe

# Knowing – Deepening – Orientation

## Jewish Museum Berlin

**CLIENT**
Stiftung Jüdisches Museum Berlin

**LOCATION**
Berlin, Germany

© Jewish Museum Berlin, Photo: Yves Sucksdorff

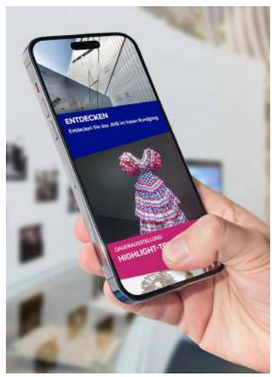
The fully accessible media guide of the Jewish Museum Berlin, which NOUS has been developing since 2019, offers visitors to the world-famous institution the opportunity to experience and explore the museum and its contents in a number of new and complementary ways.

In a design adapted to Daniel Libeskind's pioneering museum architecture, the guide – which is available both as a public app and on rental devices – provides more details about the permanent exhibition, which reopened in 2021. Visitors can immerse themselves in the exhibited artifacts on a number of digital sub-levels and obtain further information on the objects via categories such as *deepening*, *browsing* or *encountering*. In addition to this, the physical spatial installations are enhanced by digital extensions that encourage easy-to-understand interactions with the permanent exhibition. Visitors to the *Hall of Fame* can use the swiping gestures familiar from dating apps in order to become better acquainted with contextually significant historical personalities; the Kashrut Station offers a playful introduction to kosher food, and quizzes enable us to learn more about Jewish forms of building.

A location function that is guided by iBeacons and supported by descriptions and photographs at the intersections simplifies orientation within the architecturally complex building. The media guide has also been optimized via Design Thinking and coordinated from the very start with advisors from Berlin's Self-Help Organisation for the Blind and Visually Impaired: For people with visual impairments, all texts are available in read-aloud format, all audio tracks in read-along format, and all images are backed up with descriptive texts. Following a comprehensive update in 2024, an additional 20 stations in German Sign Language and 50 stations in Simple Language now ensure optimum accessibility.

Finally, the native apps offer a range of – exclusively digital – special tours, which can be individually selected and obtained with the support of the map function.

© Jewish Museum Berlin, Photo: Roman März

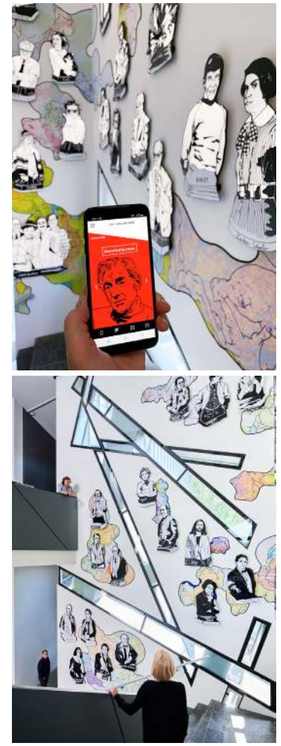




Der von NOUS für das Jüdische Museum Berlin ab 2019 entwickelte voll-inklusive Medienguide bietet den Besucherinnen des weltweit bekannten Hauses die Möglichkeit, das Museum und dessen Inhalte auf neue und ergänzende Weise zu erfahren und zu erkunden.

Im Design an den architektonisch wegweisenden Stil von Daniel Libeskind angepasst, stellt die sowohl als Public App wie auch auf Leihgeräten ausgegebene Anwendung weiterführende Informationen zur 2021 neu eröffneten Dauerausstellung zur Verfügung: So ist es über mehrere digitale Unterebenen möglich, in ausgestellte Artefakte einzutauchen und weiterführende Informationen zu den Objekten zu erhalten, beispielsweise kategorisiert in *Vertiefen*, *Stöbern* oder *Begegnen*. Weiters werden realräumliche Installationen durch Erweiterungen in den digitalen Raum ergänzt und dadurch einfach verständliche Interaktionen mit der Dauerausstellung geboten. Um kontextuell bedeutende historische Persönlichkeiten besser kennen zu lernen, können in der *Hall of Fame* aus Dating-Apps bekannte Swipe-Gesten angewandt werden, an der Kaschrut-Station erfährt man spielerisch über koscheres Essen; in Quizzen lernt man über jüdische Bauformen.

Über eine durch iBeacons gesteuerte und durch Beschreibungen und Fotografien der Kreuzungspunkte unterstütze Verortungsfunktion wird die individuelle Orientierung in dem architektonisch anspruchsvollen Gebäude erleichtert. Auch wurde der über Design Thinking optimierte Medienguide seit Anbeginn mit den Beraterinnen des Allgemeinen Blinden- und Sehbehindertenvereins Berlin abgestimmt: Für Menschen mit Sehbeeinträchtigung sind ausnahmslos alle Texte vorlesbar, vice versa sind sämtliche Audio-Tracks als Mitlese-Texte verfügbar, Abbildungen sind mit Beschreibungstexten hinterlegt. Nach einem umfassenden Update 2024 wird durch zusätzlich 20 Stationen in Deutscher Gebärdensprache und 50 Stationen in Leichter Sprache höchstmögliche Accessibility gewährleistet.

Schließlich werden über die nativen Apps verschiedene, ausschließlich im Digitalen verfügbare, Spezialtouren angeboten, die von den Besucherinnen individuell und durch die Kartenfunktion unterstützt, wähl- und rezipierbar sind.



© Illustrations: Andree Volkmann, Jewish Museum Berlin,photo: Yves Sucksdorff

# Navigating Through Ancient Egypt

## State Museum of Egyptian Art

**CLIENT**
Staatliches Museum Ägyptischer Kunst

**LOCATION**
Munich, Germany

**PARTNER**
die Werft

© State Museum of Egyptian Art

The State Museum of Egyptian Art in Munich is one of the most important collections in the German-speaking world. The museum houses exhibits covering the entire early history of Ancient Egypt and Sudan up to the Coptic period. As part of the museum's reorganisation, NOUS developed and now operates a media guide that offers additional information about exhibits including audio files, reconstructions, comparative objects, and videos, and also translates all wall and object texts into five languages. The navigation concept was also completely redesigned and now allows visitors to choose between a highlight tour and a free tour, during which they can see – on a 3D display – their location, the objects around them, and the shortest route to the next station. In addition to this, many objects can be viewed from all sides and 3D interaction enables visitors to travel through time and to experience – live – activities such as the production of stone vessels. In 2020, the media guide was expanded with a special offer for children between 7-10 years. The young visitors are invited to take their tablet on a pharaoh hunt led by the museum's mascots Isi and Usi. The exciting journey includes 18 games, educational video sequences, and audio descriptions on the subject of Egyptian art.

Das Staatliche Museum Ägyptischer Kunst in München zählt zu den bedeutendsten Sammlungen im deutschsprachigen Raum. Das Museum besitzt Exponate aus allen Epochen des Alten Ägypten und des Sudan – bis in die koptische Zeit. Im Zuge des Neubaus des Museums entwickelte und betreibt NOUS einen Medienguide, der Zusatzinformationen wie Audios, Rekonstruktionen, Vergleichsobjekte und Videos zu den verschiedenen Exponaten bietet – eine Übersetzungsfunktion zeigt zudem sämtliche Wand- und Objekttexte in fünf Sprachen.

Völlig neu erdacht wurde auch das Navigationskonzept: Dieses erlaubt es den Besuchern zwischen einer Highlight-Tour und einem freien Rundgang zu wählen. Sowohl ihr Standort, die umliegenden Objekte wie auch der kürzeste Weg zur nächsten Station werden während des Rundgangs am Display in einer 3D-Raumdarstellung angezeigt. Weiters sind viele Objekte von allen Seiten einsehbar dargestellt, mittels 3D-Interaktion werden auch Zeitsprünge ermöglicht: So kann etwa die Herstellung von Steingefäßen gleichsam live miterlebt werden.

2020 wurde der Medienguide mit einem speziellen Angebot für Kinder zwischen 7-10 Jahren erweitert. Die jungen Besucherinnen werden eingeladen, sich mit dem Tablet im Museum etwa auf Pharaonenjagd zu begeben: Isi und Usi – die Maskottchen des Museums – nehmen die jungen Besucher dabei mit auf eine spannende Reise mit 18 Spielen, lehrreichen Videosequenzen und Audiobeschreibungen rund um das Thema Ägyptische Kunst.



# Cosmic Dimensions

## document Kepler

**CLIENT**
Stadt Regensburg

**LOCATION**
Regensburg, Germany

**PARTNERS**
merz merz Architekten, Zone Media

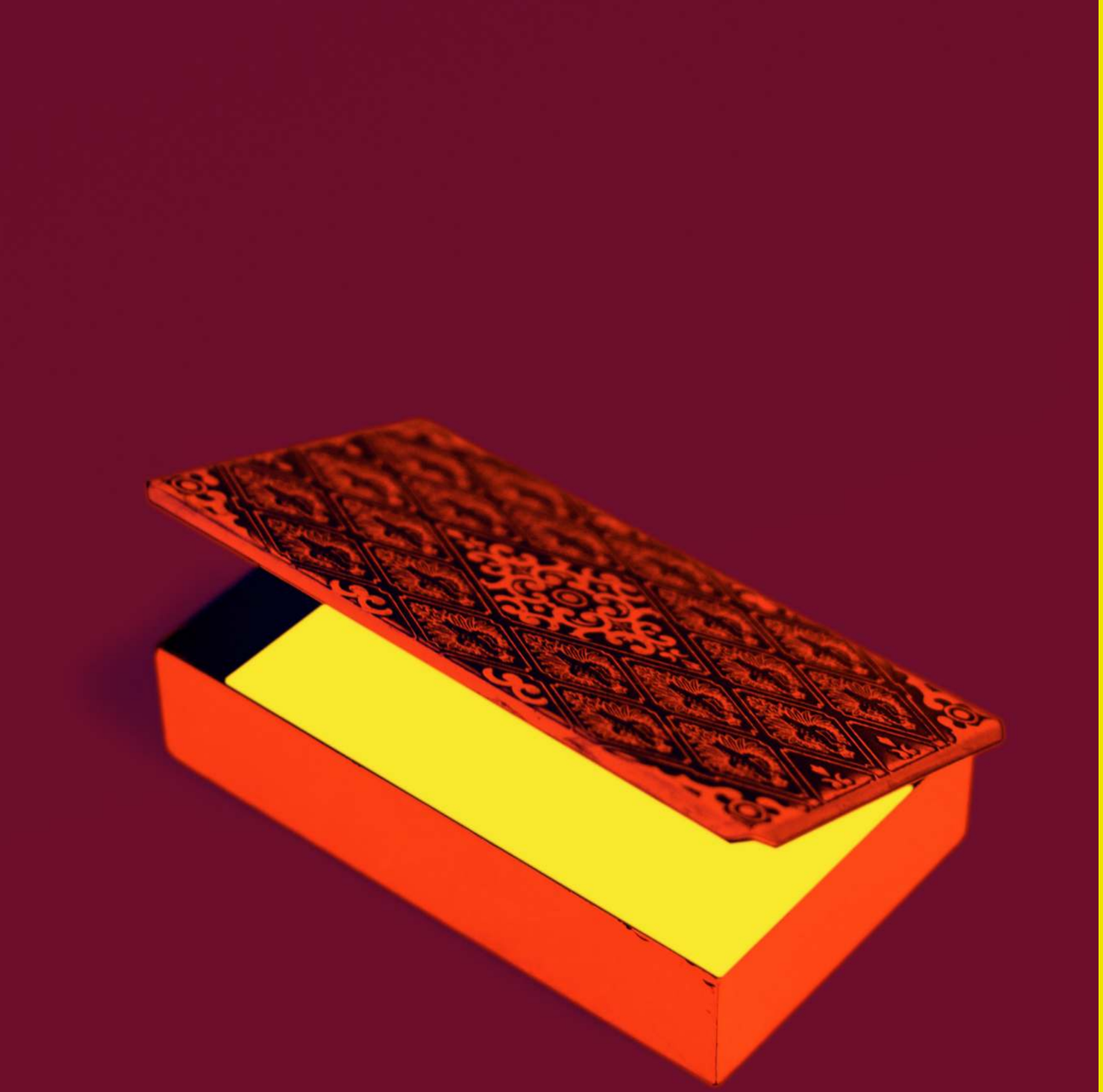
© Stadt Regensburg, Stefan Effenhauser

Following a comprehensive refurbishment and a remodeling by merz merz Architekten, the exhibition in the final residence of the famous astronomer Johannes Kepler in Regensburg reopened in February 2024. Traditional exhibits such as books and historical instruments are now complemented by interactive elements. NOUS was responsible for the planning, design, and implementation of all media in the museum.

With Kepler as a first-person narrator, the newly designed media guide is entertainingly informing about not only Kepler's scientific findings but also the associated episodes of his life. The audio content in German, English, and Sign Language is provided to visitors individually in line with their exact position within the museum – the location sensitive app is available both on in-house devices and in app stores. The result is a further reference project for museum work in a historical building.

Nach umfassender Sanierung wurde die Ausstellung im Sterbehaus des berühmten Astronomen Johannes Kepler in Regensburg durch merz merz Architekten neu konzipiert und im Februar 2024 wiedereröffnet. Traditionelle Exponate etwa in Gestalt von Büchern oder historischen Instrumenten wurden durch interaktive Elemente ergänzt. NOUS hat dafür die Planung, Gestaltung und Implementierung aller Medien im Museum umgesetzt.

Mittels des eigens gestalteten Medienguides begleitet Kepler als Ich-Erzähler die Besucher durch das Museum und vermittelt auf unterhaltsame Weise nicht nur seine wissenschaftlichen Erkenntnisse sondern auch zugehörige Episoden aus seinem Leben. Die Audio-Inhalte in deutscher, englischer und Gebärdensprache werden den Besucherinnen durch deren genaue Lokalisierung individuell zur Verfügung gestellt – die standortgenaue App ist auf Inhouse-Geräten und in den App-Stores verfügbar. So ist ein weiteres Referenzprojekt für Museumsarbeit in einem historischen Gebäude entstanden.



Tap into

# Digitalisation.
# Archiving.
# Participation.

Fluid Collections

# From Data Graveyard to Culture Hackathon

## The benefits of digitised museum collections

**TEXT** Franziska Mucha

Franziska Mucha
Curator for Digital Museum Practice, Historisches Museum Frankfurt (DE)

***"In a limited period of time, interested members of the public are invited to get creative over the course of a design sprint. The interaction between spontaneity, interdisciplinarity and practice reveals new perspectives."***

Even before the pandemic, many museums had begun digitising their collections, discussing open content licences for the extended use of digitised assets, and aspiring to provide broad-based access via various Internet platforms. As important as this groundwork is, it represents only one aspect of the promise offered by digital democratisation. The other aspect is the use made of digitised collections, through which their social potential can only then be exploited. Although the importance of the objects for users outside the museum is a recurring argument in favour of digitisation projects, the interests and practices of these users as they engage with digital objects are still poorly understood (Clough et al., 2017). This knowledge gap became apparent in the context of lockdown experiences, when many museums found themselves for the first time obliged to reflect on how objects can be used in digital learning, relaxation or creativity.

In this article, I suggest that we equip ourselves for the next pandemic by finally understanding the users' perspective. One excellent opportunity for doing this comes in the shape of culture hackathons, for example, in which new user scenarios are developed collaboratively. The hackathon format – a word coined by combining hacking and marathon – emerged from the technology sector and is based on participatory design concepts: in a limited period of time, interested members of the public are invited to get creative over the course of a design sprint. The interaction between spontaneity, interdisciplinarity and practice reveals new perspectives. Lodato and di Salvo describe this process as the "collective imagination of how future users could themselves participate in an issue through the props attendees are constructing" (Lodato and DiSalvo, 2016: 554). Since hackathons aim to create tangible prototypes, the hackers produce one of the many possibilities and thus contribute to our "social imaginaries" (ibid.). Referring to culture hackathons, Moura de Araújo describes a new constructivist method of interpretation, which brings to light the

***"The digitisation of collections makes them more fluid, more tangible and full of possibilities."***

potentialities of digitised cultural collections that have hardly ever been fulfilled in the museum context thus far: the sensory immersion in cultural data, the narrative quality of various media and the tension between historical evidence and contemporary issues. The users' creative practices are the key to these potentialities that lie in the virtual nature of digital objects: "To the hacker there is always a surplus of possibility expressed in what is actual, the surplus of the virtual. This is the inexhaustible domain of what is real but not actual, what is not but which may become" (Wark, 2004).

The digitisation of collections makes them more fluid, more tangible and full of possibilities. Objects can thus be connected to questions of everyday life and personal interests. The Internet provides an infrastructure for maintaining the availability of data and enabling communication.

But a "digital contact network" (Hogsden et al., 2012), a social network or framework in which the objects are meaningful and meaning is created, is required. This framework can come about in the context of co-creative events or through digital forms of collaboration. Regardless of what form is chosen, it is the task of museums to develop collaborations and forge partnerships based on a "logic of care" (Morse, 2021) so that such networks are created and the potential is transformed. Only in this way can museums make the collections they hold in trust for the public productive and relevant for people.

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# Skim, Swim & Dive

## VALIE EXPORT Center Linz

**CLIENT**
VALIE EXPORT Center

**LOCATION**
Linz, Austria

© Violetta Wakolbinger / VEC

VALIE EXPORT is considered to be a global pioneer and leading proponent of feminist art. Since 1967 she has been part of the Actionist avant-garde in both visual and conceptual art, and to this day her work is regarded as iconic in the fields of media, film, performance and archive art. In 2015, VALIE EXPORT gave her archive to the city of Linz as a premature legacy: around 200,000 archive items in all kinds of media. The project of turning this archive into digital form began in 2019 and was made publicly accessible in 2023.

In order to make the digital archive and its functionalities available for particular kinds of use, the *skim, swim & dive* strategy was put into action. These typologies of use create three personas that enact the functions of random search, browsing and detailed search. On the one hand, *skim* enables non-hierarchical access to the *experience*, while *swim* gives access to hypothesis-based research, and *dive* allows for a targeted, academic, detailed search for specific archive material. In this context, this group of research personas, for example, using a full-text index of OCR-captured archive material, can appreciate the archive as a place of artistic research at the topos of the VEC itself. Ultimately, the curated realm of the digital archive is transforming into a web-based medium the approach to the archive as aesthetic strategy that VALIE EXPORT herself helped to develop. The differentiation between work and documentation as sources, for example, is specifically highlighted by means of an art- and media-appropriate re-presentation of the artefacts in the digital domain.

This also enables an active, ongoing collaboration with VALIE EXPORT and emphasises the distinctive features of her premature legacy as both an analogue and digital archive.

VALIE EXPORT gilt weltweit als Pionierin und Haupt-Protagonistin der feministischen Kunst: Seit 1967 vertritt die Künstlerin eine sowohl aktionistische, bildende wie auch konzeptuelle Avantgarde und setzt bis heute Maßstäbe in den Bereichen Medien-, Film-, Performance- und Archivkunst. 2015 übergab die Künstlerin ihr Archiv als Vorlass an die Stadt Linz, rund 200.000 Archivalien jedweder Medialität. Seit 2019 wurde mit der Konzeption einer digitalen Repräsentation begonnen, welche 2023 der Öffentlichkeit zugänglich gemacht wurde.

Um das digitale Archiv und dessen Funktionalitäten spezifischen Anwendungsszenarien dienlich zu machen, wurde die Strategie des *skim, swim & dive* umgesetzt. Mittels dieser Nutzertypologien wird eine 3-Teilung der Personas in die Funktionen *Flanieren, Stöbern* und *Detailsuche* erreicht. Dies ermöglicht einerseits einen nicht-hierarchischen Zugang des Erfahrens (*skim*), weiters eine hypothesengeleitete Recherche (*swim*), wie auch eine zielgerichtete und wissenschaftlich motivierte Detailsuche nach bestimmten Archivalien (*dive*): Hierzu kann etwa die Personas-Gruppe der Wissenschaftlerinnen über einen Volltext-Index der OCR-erkannten Archivalien dem am VEC gepflegten Topos des Archivs als Ort der künstlerischen Forschung Rechnung tragen. Der kuratierte Bereich des digitalen Archivs kann schließlich den von VALIE EXPORT mitentwickelten Ansatz des *Archivs als ästhetische Strategie* in das netzbasierte Medium transformieren: Die quellenkundliche Differenzierung etwa zwischen Werk und Dokumentation wird mittels kunst- und mediengerechter Re-Präsentation der Artefakte im Digitalen dezidiert ausgewiesen.

Dies ermöglicht auch weiterhin die aktive Zusammenarbeit mit der Künstlerin und stellt die Besonderheit der Bezugnahme auf den Vorlass-Charakter sowohl des analogen wie auch des digitalen Archivs in den Vordergrund.

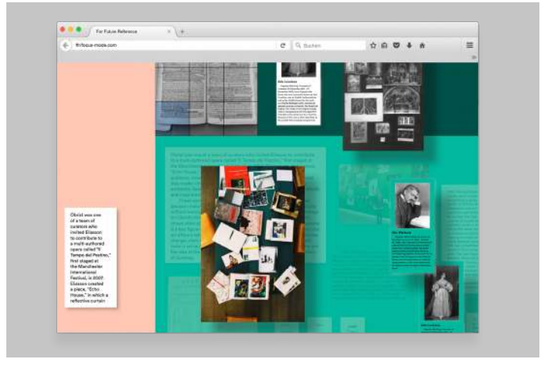


# Serendipities

## aws impulse + Marie Artaker

**CLIENT**
Marie Artaker,
Austria Wirtschaftsservice (AWS)

**LOCATION**
Vienna, Austria

Together with graphic designer Marie Artaker, we developed the web app *For Future Reference*, the prototype of a digital conception and innovation tool for creative professionals such as art directors, film directors and curators. The tool enables the collection and management of data and ideas in words, images and links. It is used for self-determined curating and the organisation of found and self-created content. A non-linear system enables new, self-generating relationships that promote creativity between types of content, supported by chance discoveries. *For Future Reference* works as an alternative to creating structure using categories and tags alone and thus differs significantly from well-known tools that are based on storage in folders and lists. At the heart of the web app is the map level: this consists of scalable colour fields that can be selected associatively according to content. Cross-references are automatically generated via these colour links, source information or the respective data, and the relevant content is connected. The results are digital-immanent mnemotechnical approaches that relate to visual, spatial, semantic and episodic sources.

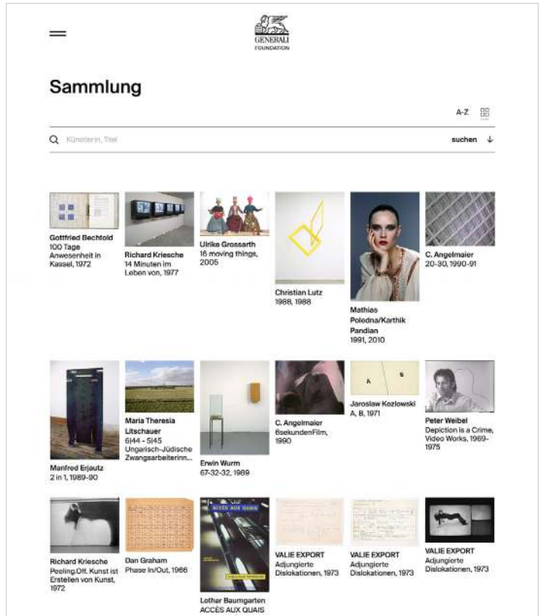
Gemeinsam mit der Grafikdesignerin Marie Artaker haben wir die Web-Applikation *For Future Reference* entwickelt: Den Prototyp eines digitalen Konzeptions- und Innovationstools für Kreativschaffende wie Art-Direktorinnen, Regisseure oder Kuratorinnen. Die Webanwendung ermöglicht das Sammeln und Verwalten von Daten und Ideen in Wort, Bild und Verlinkungen. Es dient dem selbst bestimmten Kuratieren und Organisieren von gefundenen und selbst erstellten Inhalten. Eine nicht-lineare Ordnung ermöglicht neue, selbst generierende und damit kreativfördernde Beziehungen zwischen den Inhalten, unterstützt durch serendipische Entdeckungen. Die Funktionsweise von *For Future Reference* stellt eine Alternative zur alleinigen Strukturierung durch Kategorien und Tags dar und weicht damit von Tools ab, die sich an der Aufbewahrung in Ordnern und Listen orientieren. Im Zentrum der Web-Applikation steht die Ebene der Karte: Diese setzt sich aus skalierbaren Farbfeldern zusammen, die assoziativ zu den Inhalten gewählt werden können. Querverweise werden automatisiert über diese Farbzuweisungen, Quellenangaben oder das jeweilige Datum generiert, die jeweiligen Inhalte miteinander verbunden. Das Resultat sind digitalimmanente mnemotechnische Herangehensweisen, bezogen sowohl auf visuelle, räumliche, semantische wie auch episodische Quellenlagen.

# Cultural and Social Responsibility

## Generali Foundation

**CLIENT**
Generali Foundation

**LOCATION**
Salzburg, Austria




In the course of moving into the new home of the Generali Foundation's extensive collection at the Museum der Moderne Salzburg, the website 2023, which was already designed by NOUS in 2010, underwent an extensive redesign: advanced digital collection management, object-, art- and media-oriented presentation as well as a contemporary visual sign language take into account the efforts for digital accessibility of the collection, which comprises more than 2,000 works. In addition to an extensive information platform on the origins, core areas, events, and purpose of the institution and the collection, a digital collection presentation of the latest generation was created in collaboration with the Generali Foundation and typographer Martha Stutteregger, which also corresponds to the high media-artistic components of the collection.

Im Zuge des Bezugs der neuen Heimstätte der umfangreichen Sammlung der Generali Foundation im Museum der Moderne Salzburg erfuhr die bereits 2010 von NOUS entworfene Webpräsenz 2023 ein umfangreiches Re-Design: Avancierte digitale Sammlungspflege, objekt-, kunst- und mediengerechte Darstellung sowie eine zeitgemäße visuelle Zeichensprache tragen den Bemühungen um digitale Zugänglichkeit der über 2.000 Werke umfassenden Sammlung Rechnung. Neben einer umfangreichen Informationsplattform zu Entstehung, Kerngebieten, Veranstaltungen sowie Zweck der Institution und der Sammlung entstand so in Zusammenarbeit mit der Generali Foundation und der Typografin Martha Stutteregger eine – auch den hohen medienkünstlerischen Anteilen der Kollektion entsprechende – digitale Sammlungspräsentation neuester Generation.



# Contemporary Art for a Young Institution

## European Central Bank

**CLIENT**
Europäische Zentralbank

**LOCATION**
Frankfurt/Main, Germany

© Thorsten Jansen, ECB



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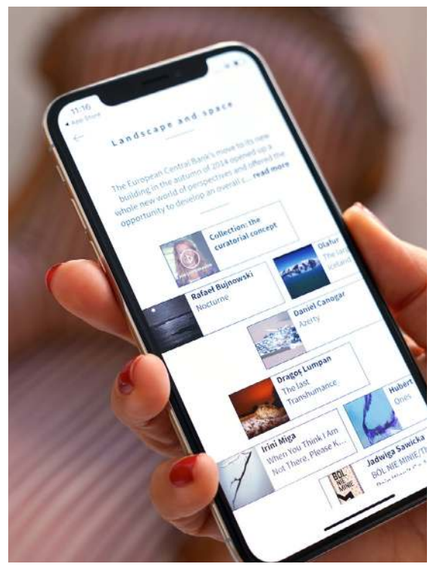
The art collection of the European Central Bank in Frankfurt comprises more than 500 works by 200 artists from 25 countries. As some of the exhibits are not accessible to the public, NOUS was asked to develop an app that presents the collection digitally to art enthusiasts worldwide. Unlike a printed catalogue, the digitally transformed collection is also able to offer updated background information on special exhibitions or on the collection's wider focus of contemporary, young art from EU member states. By interlinking such elements as video, audio, slideshows, or augmented reality, digital technology both expands the information space and supports modern mediation strategies. For example, works can be selected via image recognition and then understood in greater depth with the help of augmented reality. In order to provide an overview of the built context of the artworks, a 3D model of the two locations in Frankfurt was created and integrated into the app. It also provides information about the architectural history of the site and the sculptures that are displayed in its outdoor spaces.

Die Kunstsammlung der Europäischen Zentralbank in Frankfurt umfasst mehr als 500 Kunstwerke von 200 verschiedenen Künstlerinnen aus 25 Ländern. Ein Teil der Exponate ist nicht öffentlich zugänglich, weshalb NOUS eine App entwickelte, welche die Sammlung für Kunstinteressierte aus aller Welt digital repräsentiert: Anstelle eines gedruckten Katalogs bietet die digital transformierte Sammlung auch aktualisierte Hintergrundinformationen zu Sonderausstellungen oder zum allgemeinen Fokus auf zeitgenössische, junge Kunst aus den EU-Mitgliedsländern.

Über miteinander verknüpfte Vertiefungsebenen wie Video, Audio, Slideshows oder Augmented Reality erweitert digitale Technik auch hier den Informationsraum und unterstützt moderne Vermittlungsstrategien: So können etwa die Werke durch Bilderkennung angewählt und mittels Augmented Reality tiefer erfasst werden. Um einen Überblick über die Verortung der Kunstwerke im Haus zu ermöglichen, wurde ein 3D-Modell der beiden Standorte in Frankfurt erstellt und in die App integriert. Zusätzlich werden auch Informationen über die Architekturgeschichte des Standortes und die Skulpturen im Außenbereich angeboten.



# Multimedia History

## House of European History

**CLIENT**
House of European History

**LOCATION**
Brussels, Belgium

**PARTNER**
Meyvaert Museum

© Dominique Hommel / European Union

Opened in 2017, the House of European History in Brussels displays milestones of European history since the 19th century: A new collection was founded for the museum, which interacts with multimedia elements to make history an interactive experience.

For this purpose, NOUS broke new ground in media interactivity through visitor triggering by means of a media guide: As in the Parlamentarium – the visitor centre of the European Parliament – the guide acts as a key to the content, which is available in the 24 official languages of the European Union. A special localisation solution for determining the position of tablet users in the museum guides visitors through the rooms and topics of the permanent exhibition. Numerous participation options offer an interactive multimedia experience whose technical complexity does not impose itself on the visitor, but rather remains deliberately in the background – in the sense of the sources on display.

Das 2017 eröffnete Haus der Europäischen Geschichte in Brüssel zeigt Meilensteine der europäischen Geschichte seit dem 19. Jahrhundert: Für das Museum wurde eine neue Sammlung gegründet, die im Zusammenspiel mit multimedialen Elementen Geschichte interaktiv erfahrbar macht.

Dafür beschritt NOUS mittels eines Medienguides neue Wege in der Interaktivität durch Besucher-Lokalisierung: Der Guide fungiert wie schon beim Parlamentarium – dem Besucherzentrum des Europäischen Parlaments – als Schlüssel zu den Inhalten, die in den 24 Amtssprachen der Europäischen Union zur Verfügung stehen. Eine spezielle Lokalisierungslösung zur Bestimmung der Position der Tablet-Nutzerinnen im Museum führt die Besucher durch die Räume und Themen der Dauerausstellung und bietet durch zahlreiche Partizipationsmöglichkeiten ein interaktiv-multimediales Erlebnis, dessen technische Komplexität sich nicht aufdrängt, sondern im Sinne der ausgestellten Quellen bewusst im Hintergrund bleibt.





# Being Part of the Museum

## House of History Baden-Württemberg

**CLIENT**
Haus der Geschichte Baden-Württemberg

**LOCATION**
Stuttgart, Germany


© HdGBW / Franziska Kraufmann

An interactive history platform, InGe for short, has been developed in collaboration with the Baden-Württemberg House of History. Focusing on participation, this progressive web app supports the real spatial experience inside the museum as well as the preparation for and follow-up to the museum visit. Digital Natives are also addressed in a contemporary way amongst others in Turkish language: Through participatory and interactive channels like Citizen Science, social media or photo booths. New visitor groups are involved multi-directionally and actively, thus integrating personal visit, one becomes part of the exhibition. Thanks to the innovative participation option Citizen Science, visitors can also share their knowledge with interested parties, thus transforming from passive recipients into active co-creators. Interesting stories can be collected and recorded digitally in order to find out more about them and the described experienced later, conveniently on any mobile device.

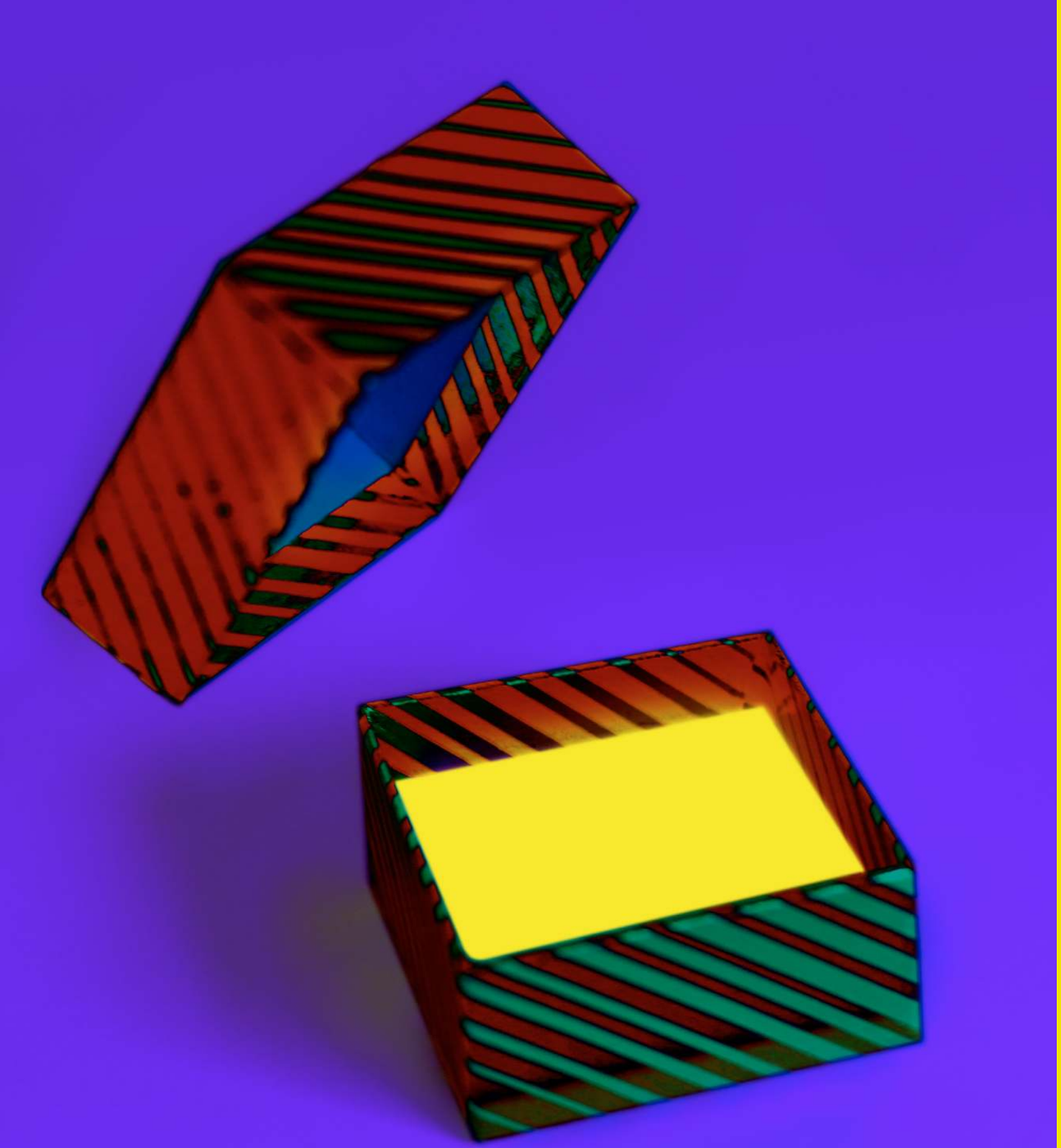
The media guide not only provides exciting facts and content about the permanent exhibition, but also offers lots of opportunities for participation: discussions, surveys and games enable a wide range of experience and participation opportunities both inside and outside the museum. All the content of the web app can be designed, changed and published independently by the museum staff in our content management system NOUS Conductor, which has been specially adapted to suit exhibition and museum structures. This enables the House of History curators to enter, change and publish all digital content on the platform independently.

In short, InGe enables the museum to act completely autonomously in terms of its content, and allows visitors to comment on and discuss what they have seen, to ask questions of the experts, to talk about their own experiences on the subject and to report on what they themselves have discovered during a visit.

Gemeinsam mit dem Haus der Geschichte Baden-Württemberg wurde eine interaktive Geschichtsplattform, kurz InGe genannt, entwickelt. Mit dem Fokus auf Partizipation unterstützt die Progressive Web App sowohl das realräumliche Erlebnis im Museum wie auch die Vor- und Nachbereitung des Museumsbesuchs. Digital Natives werden zeitgemäß angesprochen, unter anderem in türkischer Sprache: Durch partizipativ-interaktive Kanäle wie Citizen Science, Social Media oder einem Photo Booth werden neue Besuchergruppen multidirektional eingebunden und damit persönliche Erfahrungen integriert, sodass man selbst Teil der Ausstellung wird. Durch die neuartige Beteiligungsmöglichkeit Citizen Science können Besucherinnen ihr Wissen auch mit Interessierten teilen und werden so von passiven Rezipienten zu aktiven Mitgestalterinnen. Interessante Geschichten können gesammelt und digital mitgenommen werden, um später mehr über sie und die beschriebene Zeit zu erfahren – bequem auf jedem mobilen Endgerät.

So liefert der Medienguide nicht nur spannende Fakten und Inhalte zur Dauerausstellung, sondern bietet auch viele Möglichkeiten zur Beteiligung: Diskussionen, Abstimmungen und Spiele ermöglichen sowohl innerhalb als auch außerhalb des Museums vielfältige Erlebnis- und Partizipationsmöglichkeiten. Alle Inhalte der Web App können von den Museumsmitarbeitern selbstständig in unserem speziell an die Ausstellungs- und Museumsstruktur angepassten Content Management System NOUS Conductor gestaltet, verändert und veröffentlicht werden.

Kurzum: InGe ermöglicht dem Museum, inhaltlich völlig autonom im Digitalen zu agieren und den Besuchern das Gesehene zu kommentieren, zu diskutieren, Experten und Expertinnen zu befragen, über eigene Erfahrungen zum Thema zu sprechen oder über das zu berichten, was sie selbst bei oder während eines Besuchs herausgefunden haben.



Tap into

Inclusiveness.
Multisensory.
Playfulness.

Digital Humanism

# Digital Humanism

**INTERVIEW** Hannes Werthner (University of Technology Vienna), conducted by Gunther Reisinger (NOUS)

Hannes Werthner

Retired Professor, Institute of Informatics, University of Technology Vienna (AT)

GUNTHER REISINGER **I would like to start with the by now well known bracket of Digital Transformation: What is your view of this term? Do you think it is different from digitalisation?**

HANNES WERTHNER I have a split relationship with the term Digital Transformation for several reasons: essentially, we are talking about an informatization of our society rather than a digitalisation. Which, as I understand it, means that we can represent certain data or certain processes digitally, i.e. discretely. In principle, it revolves around formalisation, we are not just thinking about automation, but about how to automate work processes and in some cases even political processes.

It therefore goes far beyond what is understood within computer science studies by the term Digitalisation, quite like how the term Artificial Intelligence is currently used as synonymous with Machine Learning as well as Deep Learning with neural networks, although neither of these mean the same thing.

Furthermore, it is important to mention that this process started much earlier: Fortune Magazine wrote as early as 1988 that computers are becoming so powerful, or are already so powerful, that companies need to base their strategies on them. So companies don't use computers to implement their strategies, but the other way around: the strategy has to take the tool into account or align itself with it. That was 35 years ago, that's how long this process has been going on. However, these processes only appear on the surface after a certain amount of time, and only then does it become visible and gain social momentum.

The third aspect that comes to mind is that strong inequalities can be observed: On a geographical level, political and social level. During the pandemic, we saw that social barriers and distances expanded. Informatization in particular shows that different speeds are dominant in this respect and that the digital divide is greater than assumed. Even within metropolises or within the so-called richer north of this society.

GR **Could you say that you can only transform something that is already in the digital? In the Digital Humanism initiative, which you played a major role in supporting, it's all about thinking in terms of the digital. How would you define the term Digital Humanities?**

HW Digital Humanities is the use of mathematical-informatics methods in the humanities – to some extent also in the social sciences. This shows that computer science as a method with its artifacts captures and also transforms the other disciplines: These artifacts are software, methods, procedures, but also ontologies, paradigms, and ultimately views of the world.

Digital Humanities currently possess a great dynamic and a transformative shaping power – also with regard to other disciplines. There is an abundant amount of data available on the web today: If used wisely, relevant results of analysis can be achieved relatively quickly. One just has to be careful how the data is designed, to work methodically clean. Basically, one should not glorify machines used in this way as overpowering God-given miracles, but always keep in mind that they are prone to error, like everything created by man. This would be a task of the humanities and social sciences – and for me this also includes economics: There is a responsibility to open up and discuss the terminology on



***"What is algorithmics actually about? Is it the goal to realize something as quickly as possible or is it the goal to develop something with fault tolerance?"***

a paradigmatic-ontological level. For example, with regard to the definition of the procedures, in relation to the methods, the variables or the informatic views.

Computer science is currently facing the well-known contradiction of becoming neither the dominant power, nor only the tool supplier. If we are only tool suppliers, then we make ourselves appear as less than we are, and the other disciplines will not be able to do anything with us in the long run.

Digital Humanism is something different, with an already very long history in computer science. In the first workshop in April 2019 at the Department of Computer Science, we looked how computer science relates to society and to people, to the design of technology for people. We understand it as reflective computer science, in the sense that computer science also needs the other disciplines to describe, analyse and also – if possible – influence complex techno-socio-economic processes.

GR **Could you perhaps describe very briefly how this came about? Were there any special occasions?**

HW There was the book by Julian Nida-Rümelin and Nathalie Weidenfeld in 2018 (Note: *Digital Humanism. An Ethics for the Age of Artificial Intelligence*), which deals with the digital space, with the limits of human beings and the limits of computer science. For example, it deals with ethical questions about the use of AI, or with the treatment of informative concepts or objectives in film. At the same time, I set up an international advisory board: This board advises us on future directions, evaluates, and makes suggestions for improvement.

The essence of all these discussions on the part of IT was: We see how much we are changing, but at the same time we have an uneasy feeling about it. Shouldn't we be thinking about the fact that we also have a certain responsibility? It was clear relatively soon that this would require a multidisciplinary approach: That's why, in April 2019, a workshop was initiated, with speakers from different disciplines such as jurisprudence, anthropology, philosophy, about technology consequences and technology history, about computer science. The Vienna Manifesto was also proposed, discussed and adopted there.

GR **For many years, the discussion revolved around hierarchies between disciplines: it is very interesting that this initiative came from the technical sciences and was not initiated by the humanities. Do you think the time has come to face each other and actually work together, away from hierarchical structures, in terms of constructive interplay between disciplines?**

HW As we write in the manifesto: We are at a crossroads. The manifesto is a call to think about that. A call to all kinds of decision-makers and non-decision-makers about a certain research orientation or research policy, a call to actively shape it. At the same time, it is important to understand technology or computer science as something that is contextualized, that always has to be thought of in a societal context, be it societal as a whole or within a company.

What is algorithmics actually about? Is it the goal to realize something as quickly as possible or is it the goal to develop something with fault tolerance? In short, is the goal of an architecture to be fault-tolerant or efficient? And this is where the aforementioned context comes into play: for example, the architecture of the Internet is not particularly efficient, but the architecture of the Internet was originally designed to be fault-tolerant (because it was decentralized).

GR **How could the executing companies be more actively involved in such political processes? You yourself headed a research unit for e-commerce at the Vienna University of Technology: Have your experiences in this field over the past decades had any influence on this initiative?**

HW As an example, I co-founded and set up Tiscover: A very early platform idea, entrenched with platform economics and network dynamics. Tiscover was then sold and disappeared. In general, I have become an observer of

missed opportunities in e-commerce – at least from an Austrian perspective. However, even at the European level, many projects were not pursued due to conflicting interests at local, regional or national level. You become more sensitive and see how things develop, grow and endure, or not.

Digital Humanism is broader in this regard: These insights, I had about missed opportunities at the European or Austrian level, raise awareness and broaden the view in the long term.

**GR How and where could the implementing parties get actively involved? Keyword: the Vienna Manifesto!**

HW Digital Humanism is a construct of ideas on which one can continue to work. On the theory-building level, as well as on the political level. In Vienna, for example, this topic is anchored in the government programme.

And there is the idea of a Vienna Institute for Digital Humanism in the government programme, as well as research tenders where several disciplines have to cooperate with each other, a cooperation between research and development with a view to transferring knowledge, involving the education system as well as politics. For example: How must software be conceived and built in a new way, together with technicians, sociologists and humanities scholars. Is data protection going to be discussed, are other disciplines involved?

**GR Can you briefly describe why the manifesto form was chosen? After all, the manifesto has always been a very powerful political weapon, a kind of protest, ultimately born out of the history of postulating.**

HW It is indeed meant to be an outcry. But not only to the world outside, to those who decide, but also to ourselves, because we also participate in decision-making. It's both. And we also end up saying "It depends on us", whoever the "us" is. I see few besides us taking action, so we have to take matters into our own hands. The suggestion came ultimately from Hans Akkermans (note: Univ. Prof Business Informatics, Amsterdam), with an outcry to us, to our scientific colleagues in our own and other disciplines, along with civil society.

However, we are also aware that we are mostly preaching to the choir. It is to be read as a kind of self-knowledge, which is – especially for computer scientists – quite critical.

**GR Wouldn't the implementing institutions also be well involved? Once again, I'm referring to the agencies, who develop most of the solutions.**

HW Universities are publicly funded, so they have a social responsibility in the sense of educating and thinking. They also have the societal role of an "excellent" institution, i.e. not only there to produce know-how in the form of knowledge and personnel as cheaply and efficiently as possible. They are also there to reflect: What is not working or what can be done better, where is something going wrong? Universities are the place to boldly contradict. And that brings me to the companies: It is interesting that precisely the large US private universities, which are very good with big industry and also enjoy very good endowments, are the most critical ones.

Therefore, for me, integration or cooperation with companies does not necessarily conflict with scientific freedom. It depends on the form it takes. It depends on the rules. It must not become a case of outsourcing, because otherwise after two years I'll take my work somewhere else, where it is cheaper.

In the manifesto, we have deliberately responded to this criticism as well: We refer to all practitioners who are active in this field, and try to integrate as many as possible. These are not only companies, but also employees working in the IT departments of public institutions: We are not exclusive here, Digital Humanism is deliberately an inclusive concept.

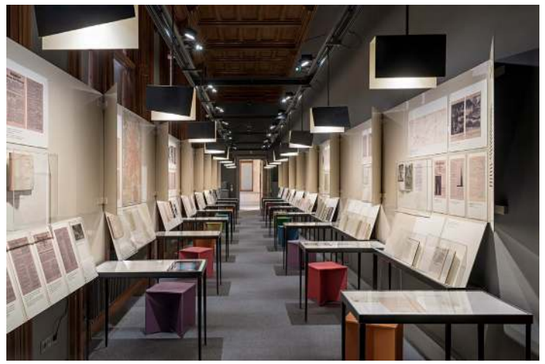
**GR Do you see a connection with the humanities-oriented institutions, such as the federal museums? Because of their educational mission, wouldn't they be interesting partners when it comes to implementing Digital Humanism in a field that, by definition, should be rooted in a humanistic ideal of thought?**

HW Yes, I think that museums are very interesting partners: We are talking to with the Vienna Library

*"Therefore, for me, integration or cooperation with companies does not necessarily conflict with scientific freedom. It depends on the form it takes. It depends on the rules. It mustn't become a case of outsourcing, because otherwise after two years I'll take my work somewhere else, where it is cheaper."*



*"... at the same time we need something to regulate our creativity – to curtail our omnipotence."*



© GABU Heindl Architektur, photo: Hertha Hurnaus

in the City Hall, for example, which is both a museum and a library – a hybrid. Likewise, the National Library has a dual function, and the municipality of Vienna also maintains working groups on Digital Humanism and cultural heritage. It's about the double-edged relationship between art, culture and IT. The distribution is changing, and at the same time we need something to regulate our creativity – to curtail our omnipotence. Or for free design. Both create virtual entities without being restricted by physical boundaries.

Computer science is similar: our software entities only follow rules of electronics, the logic of programming, but not the structural engineering of a building or its load-bearing capacity.

**GR The pandemic has prompted museums to think of major initiatives in the digital. That would be a very interesting starting point for Digital Humanism: How might we conceive of the long tradition of these institutions going further in this direction as well?**

HW One aspect is the macro level. I believe that Austria's major institutions must also open up to the idea of networks: One should by no means underestimate the possibilities of computer science as an intermediary, also in design as well as in distribution and in reaching the most diverse target groups or in creating target groups. There is undisputedly a network dynamic, so cooperation should be more important than possible individual benefits. If not, Google & Co will eventually decide what the Internet looks like.

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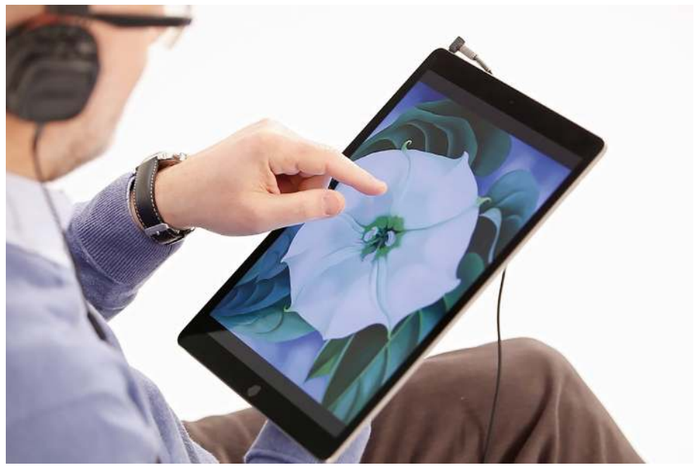
# Eye to Ear – Gallery of Audible Images

## Verena Blöchl & Katharina Götzendorfer
## Bank Austria Kunstforum



© Verena Blöchl & Katharina Götzendorfer

**LOCATION**
Vienna, Austria

**PARTNERS**
Verena Blöchl & Katharina Götzendorfer,
Bank Austria Kunstforum,
Austria Wirtschaftsservice (aws)

After discussions with blind and visually impaired people, a novel solution was devised in response to their desire for participation in the field of art and culture: The project initiators Verena Blöchl and Katharina Götzendorfer asked themselves the question: What could art education look like that appeals equally to blind, visually impaired and sighted people and fits into the museum world in the best possible way?

The iOS app Eye to Ear – Gallery of Audible Images combines sound design, verbal image descriptions and interaction via iPad to create a new art experience. Exhibits are conveyed audibly in a completely new way. The app gives blind and visually impaired people as well as people without visual impairment intuitive and exciting access to paintings, drawings and photographs. The key to this lies in the combination of intuitive touch and gesture controls, linguistic description and sound design that enables users to acoustically explore individual zones of the artwork. It turns out that the synthesis of language and sound opens up a much broader spectrum on the threshold between cognition and intuition than descriptions alone can do. The app was developed in close cooperation with the Austrian Association Supporting the Blind and Visually Impaired and NOUS. As an enabler in digital art education projects and accessible cultural services, Bank Austria Kunstforum Wien brought their curatorial expertise to a Georgia O'Keeffe retrospective as a content partner.

Eye to Ear has won many awards, including the Red Dot Award, the Art Directors Club of Europe Award, the Digital Business Trend Award and the International Design Communication Award at the Communicating the Museum conference.

Nach Gesprächen mit blinden und seheingeschränkten Personen wurde auf deren Wunsch nach Teilhabe im Kunst- und Kulturbereich eine neuartige Lösung erdacht: Die Projektinitiatorinnen Verena Blöchl und Katharina Götzendorfer stellten sich die Frage: Wie könnte Kunstvermittlung aussehen, die blinde, sehbehinderte und sehende Menschen gleichermaßen anspricht und sich bestmöglich in die Museumswelt einfügt?

Die iOS-App Eye to Ear – Gallery of Audible Images kombiniert hierfür Sounddesign, verbale Bildbeschreibungen und Interaktion am iPad und schafft so ein neues Kunsterlebnis, das Exponate auditiv auf eine völlig neue Weise vermittelt. Die App ermöglicht blinden und sehbeeinträchtigten Personen sowie Interessierten ohne Sehbehinderung einen intuitiven und spannenden Zugang zu Malereien, Zeichnungen und Fotografien. Der Schlüssel dazu liegt in der Kombination aus intuitiver Touch- beziehungsweise Gestensteuerung, sprachlicher Deskription und einem Sounddesign, das es Userinnen ermöglicht, einzelne Zonen des Kunstwerks akustisch zu erforschen. Dabei zeigt sich, dass die Synthese aus Sprache und Sound ein wesentlich breiteres Spektrum an der Schwelle zwischen Kognition und Intuition eröffnet, als es Beschreibungen alleine vermögen.

Die App wurde in enger Zusammenarbeit mit der Hilfsgemeinschaft der Blinden und Sehschwachen Österreichs und NOUS entwickelt. Als Wegbereiter für digitale Kunstvermittlungsprojekte und barrierefreie Kulturangebote beteiligte sich das Bank Austria Kunstforum Wien im Rahmen der Georgia O'Keeffe-Retrospektive als Content-Partner mit kuratorischer Expertise.

Eye to Ear wurde mit vielen Preisen ausgezeichnet, darunter der Red Dot Award, der Art Directors Club of Europe Award, der Digital Business Trend Award sowie der International Design Communication Award der Konferenz Communicating the Museum.



# Sharing Your Stories of Heritage

## Active Assisted Living (EU)

**CLIENT**
AAL (Active Assisted Living)

**LOCATION**
Europe

**PARTNERS**
Hochschule Luzern – iHomeLab (CH),
AIT Austrian Institute of Technology (AT),
Nationaal Ouderenfonds (NL),
Studio Dankl (AT), Vicino Luzern (CH),
Ijsfontein (NL), Gemeinde Zutphen (NL)

© hiStory / Milou Oomens

As part of the three-year research and development project hiStory, led by NOUS, analogue and digital solutions were developed that also invite older people to tell stories together, to share them, to consume them, and to connect them with each other in a collection based on a theme.

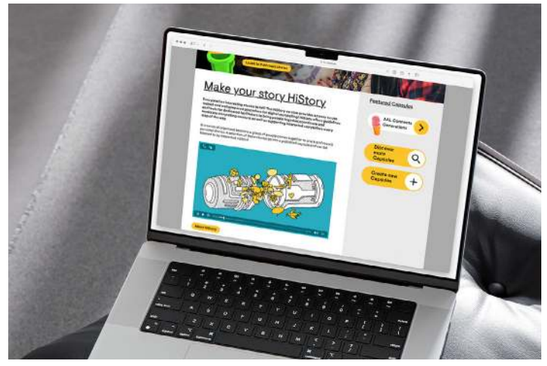
In the fields of Digital Humanism, this digital technology also enables a variety of social interactions for those who enjoy telling stories as well as for those who enjoy listening and thereby want to experience stories. The project also aims to make connections between people of different generations.

The innovative hiStory ecosystem, which NOUS has co-developed as part of the project, enables older people to record and collect their stories themselves or with relatives, friends and professional moderators. In turn, social and health institutions, museums, tourism organisations, schools and universities can also use the tools supplied by hiStory, like the interview and moderation framework or the recording progressive web app, as well as the content, which will be made available on the hiStory portal.

Im Rahmen des von NOUS geleiteten dreijährigen Forschungs- und Entwicklungsprojekts hiStory wurden analoge wie digitale Lösungen erarbeitet, die auch ältere Menschen einlädt, gemeinsam Geschichten zu erzählen, diese zu teilen, zu konsumieren und themenbezogen in einer Sammlung miteinander zu verbinden.

Im Sinne des Digitalen Humanismus ermöglicht digitale Technik damit unterschiedliche soziale Interaktionen: Für diejenigen, die gerne Geschichten erzählen, wie auch für jene, die gerne zuhören und darüber hinaus Geschichten erleben wollen. Ebenso ist es ein Ziel des Projekts, Menschen verschiedener Generationen miteinander zu verbinden.

Das von NOUS kollaborativ entwickelte innovative hiStory-Ecosystem ermöglicht die Aufzeichnung und Sammlung der Geschichten durch ältere Menschen selbst oder zusammen mit Verwandten, Freunden und professionellen Moderatoren. Sozial- und Gesundheitsinstitutionen, Museen, Tourismusorganisationen, Schulen oder Universitäten wiederum können sowohl das von hiStory bereitgestellte Moderations-Setup, eine Recording-App, wie auch die auf dem hiStory-Portal verfügbaren Inhalte nutzen.



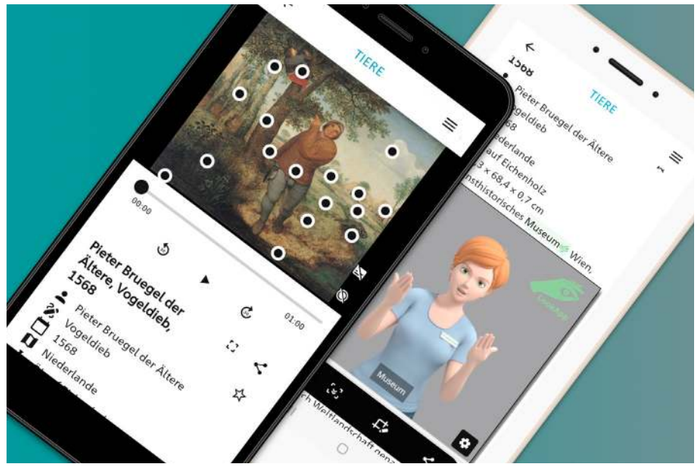
# Bringing Culture to the People – Multisensory

## Active Assisted Living (EU)

**CLIENT**
Active Assisted Living (EU)

**LOCATION**
Europe

**PARTNERS**
AIT Austrian Institute of Technology (AT), Universität Siena (IT), Feelif (SVN), VRVis (AT), Fondazione Musei Senesi (IT), Hilfsgemeinschaft der Blinden und Sehschwachen Österreichs (AT), Akademie Berlingen (CH), Sign Time (AT), Santa Casa da Misericórdia de Lisboa (PRT)




hiStory has been further refined since 2022 as part of the R&D project BeauCoup: Over the course of 2.5 years, the international collaboration with partners from Portugal, Switzerland, Italy, and Slovenia has developed a fully-inclusive, accessible, and delocalized approach to art and culture for older and visually impaired people.

Individuals without direct access to cultural objects can use three different levels of analogue and digital communication as a means of actively participating in cultural life with the help of, for example, multisensory stimuli such as haptic models (3D replicas of artworks) or specially designed aroma boxes.

The digital solutions developed by NOUS, which include location-independent guided tours or NFC-triggered audio content that can be downloaded onto the user's own smartphone, have been brought together in a fully-inclusive progressive web app and can be seen as key examples of Human-Centered Computing in the context of Digital Humanism.

Eine inhaltliche Fortsetzung von hiStory wurde ab 2022 im Forschungs- und Entwicklungsprojekt BeauCoup erarbeitet: Die internationale Kollaboration mit Partnern aus Portugal, der Schweiz, Italien und Slowenien entwickelte über 2,5 Jahre einen voll-inklusiven, barrierefreien und entorteten Zugang zu Kunst und Kultur für ältere Menschen und Menschen mit Sehbeeinträchtigungen.

Über drei analoge wie digitale Vermittlungsebenen wird Menschen die Möglichkeit einer aktiven Teilhabe am kulturellen Leben gegeben, die ihrerseits keinen Zugang zu Kulturgütern haben, beispielsweise über die Einbindung multisensorischer Reize wie haptischer Modelle (3D-Replikas von Kunstwerken) oder eigens entworfener Duftboxen.

Die dazu von NOUS entwickelten digitalen Lösungen etwa für ortsungebundene geführte Touren oder NFC-getriggerten Audio-Content auf den eigenen Smartphones wurden in einer voll-inklusiven Progressive Web App zusammengefasst und verstehen sich als zentraler Punkt des Human-Centered Computing im Kontext des Digitalen Humanismus.



# Daily Life – Made Easier

## Mobility of the Future (Austrian Research Promotion Agency)

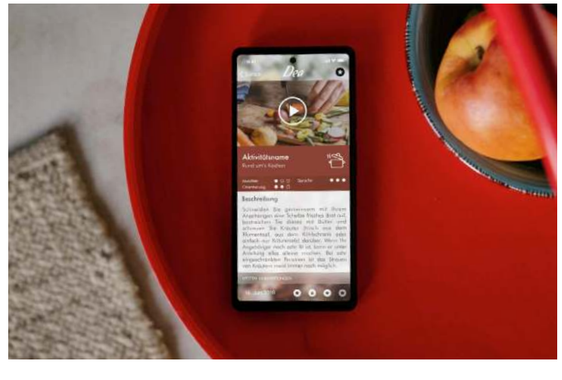
**CLIENT**
Mobility of the Future (Austrian Research Promotion Agency)

**LOCATION**
Vienna, Austria

**PARTNERS**
WPU Wirtschaftspsychologische Unternehmensberatung GmbH, MUW Medizinische Universität Wien, FHCW FH Campus Wien, raltec research group for assisted living technologies

In Austria, around 130,000 people in need of care are currently suffering from a form of dementia, and figures are rising. As part of the interdisciplinary project, an app was developed to make everyday life easier for relatives of people with dementia. The people affected are often cared for by relatives, who as a result, are exposed to a high level of stress, such as time pressure, feelings of helplessness and insecurity and disruption to their day/night rhythms. Digital technology can support interpersonal processes in these cases too. The DEA app provides individual recommendations for everyday activities and exercises for people with dementia. It is also a communication and planning platform for care that is carried out by several people and serves as a source of information on the topics of dementia, overwork and burnout.

In Österreich leiden derzeit etwa 130.000 pflegebedürftige Menschen an einer Form von Demenz – Tendenz steigend. In dem interdisziplinären Forschungs- und Entwicklungsprojekt wurde eine App entwickelt, die auch den schwierigen Alltag der Angehörigen von Personen mit Demenz erleichtern soll. Betroffene werden oftmals durch Angehörige versorgt, die dadurch hohen Belastungen ausgesetzt sind: zeitlicher Aufwand, Hilflosigkeit und Unsicherheiten oder Störungen im Tag-Nacht-Rhythmus. Im Sinne der Unterstützung zwischenmenschlicher Prozesse gibt die DEA-App dafür individuelle Empfehlungen für Alltagsaktivitäten und Übungen gemeinsam mit Menschen mit Demenz. Auch versteht sich die Anwendung als Kommunikations- und Planungsplattform für die Betreuung durch mehrere Personen und dient als Informationsquelle rund um die Themen Überlastung und Burnout. Digitale Technik wird demnach auch hier zielgerichtet als Unterstützung in den Dienst Pflegender und Erkrankter gestellt.



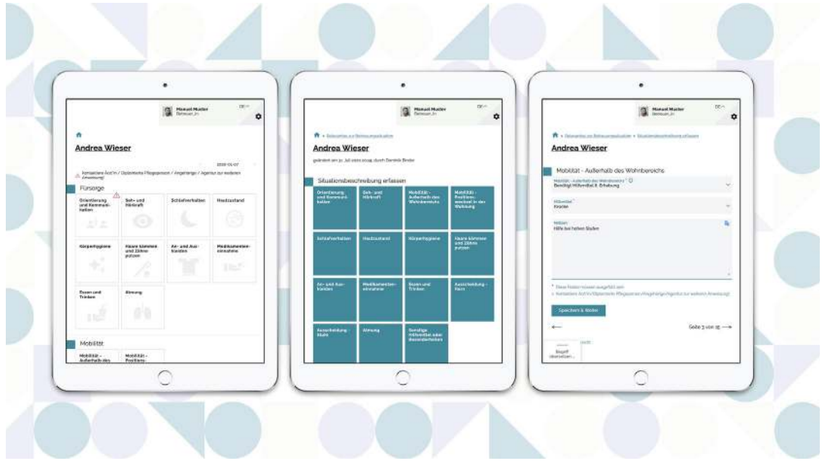
# Quality Assurance in 24-Hour Care

## Active Assisted Living (EU)

**CLIENT**
IKT der Zukunft: benefit - demografischer Wandel als Chance

**LOCATION**
Vienna, Austria

**PARTNERS**
Die Johanniter, ÖGKV Österreichischer Gesundheits- und Krankenpflegeverband, IPB – Institut für Personenbetreuung, Home-Care-Management ALEXANDER WINTER e.U., SMART ASSETS Development GmbH




More than 30,000 people in Austria are cared for in their own homes 24 hours a day. The carers often live permanently with their clients, organizing the household, helping with personal hygiene, doing the shopping and providing support in many other aspects of daily life. The carers are confronted with a variety of challenges that they may have to deal with in a language that is not their mother tongue.

The collaborative 24h QuAALity project aimed to design, develop and evaluate a software solution to guarantee the quality of this 24-hour care. The result is an app software for carers, an information, and training portal that covers recurring care and nursing situations in German, Slovak, Hungarian and Romanian, and provides electronic care documentation to support quality assurance and transparency, as well as integrated emergency management so that carers can deal professionally with emergencies. Digital technology offers the carers security in care situations and thus increases the overall quality of care.

Mehr als 30.000 Personen in Österreich werden in ihrem eigenen Zuhause 24 Stunden am Tag betreut. Die Betreuerinnen leben oft dauerhaft bei ihren Klienten, organisieren den Haushalt, helfen bei der Körperpflege, erledigen Einkäufe und unterstützen bei vielen weiteren Aspekten des täglichen Lebens. Dabei sind sie mit unterschiedlichen Herausforderungen konfrontiert und müssen diese gegebenenfalls in einer anderen als ihrer Muttersprache bewältigen.

Ziel des Konsortialprojektes 24h QuAALity war die Konzeption, Entwicklung und Evaluierung einer Softwarelösung zur Qualitätssicherung dieser 24-Stunden-Betreuung. Die entstandene Applikationssoftware für die Personenbetreuerinnen ist ein Informations- und Weiterbildungsportal zu wiederkehrenden Betreuungs- und Pflegesituationen in deutscher, slowakischer, ungarischer und rumänischer Sprache, eine elektronische Betreuungsdokumentation zur Unterstützung der Qualitätssicherung und Transparenz, sowie ein integriertes Notfallmanagement, um professionell bei auftretenden Notfallsituationen reagieren zu können. Digitale Technik gibt den Personenbetreuern in den Betreuungssituationen Sicherheit und steigert damit insgesamt die Betreuungsqualität.



# By Young People for Young People

## DFF – Deutsches Filminstitut & Filmmuseum

**CLIENT**
DFF – Deutsches Filminstitut & Filmmuseum

**LOCATION**
Frankfurt/Main, Germany


© DFF / Sabine Imhof

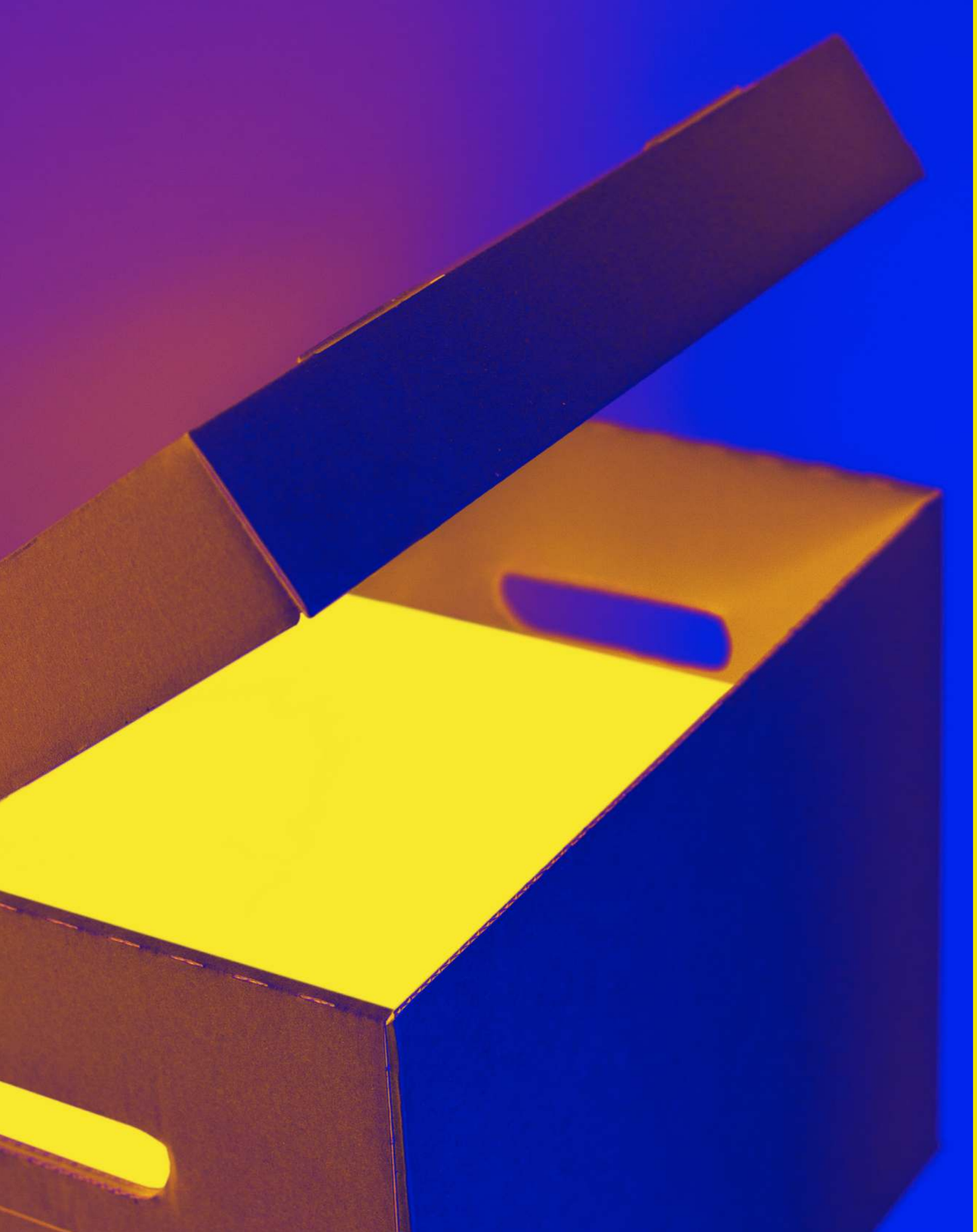
An unusual, integrative model project ran for over two years at the Filmmuseum Frankfurt: children and young people aged 9-18 from different social backgrounds worked together to create the content for the multimedia guide to the permanent exhibition. To do this, they delved deep into the museum's stories and objects. While the first group, elementary school students from a 4th grade class, learned how a museum works and conducted video interviews with the staff, a second group of 16-18 year olds dealt with the topic of Cinematic Storytelling. They were given workshops on acting, image, sound, lighting and editing, and interviewed greats of the film business – from David Bennent, the actor of *Oscar* in the film adaptation of *The Tin Drum* to Jost Vacano, the cinematographer of Wolfgang Peterson's *Das Boot*. The third group of participants, aged 14-16, dealt with the topic of Cinematic Vision by independently researching background information on their favourite objects, animating films and scoring a 3-hour silent film live in front of an audience.

Our creative team supported this project throughout its entire duration with workshops on interview techniques, writing for the ear, professional speaking, and also accompanied the children and young people during the recording sessions in the studio. We have also created the content for adult individual visitors, developed a photo game, created the UI/UX and graphic design and finally implemented the app for tablet applications.

Über zwei Jahre lang lief am Filmmuseum Frankfurt ein außergewöhnliches integratives Modellprojekt: Kinder und Jugendliche im Alter von 9-18 Jahren aus unterschiedlichen sozialen Verhältnissen erstellten in gemeinsamer Arbeit die Inhalte für den Multimediaguide zur Dauerausstellung. Dazu tauchten sie tief in die Geschichten und Objekte des Museums ein. Während die erste Gruppe – Grundschüler einer 4. Klasse – lernte, wie ein Museum funktioniert und dazu Videointerviews mit den Mitarbeiterinnen führte, setzte sich eine zweite Gruppe von 16-18-Jährigen mit dem Thema Filmisches Erzählen auseinander. Sie nahmen an Workshops zu den Bereichen Schauspiel, Bild, Ton, Licht und Montage teil und interviewten Größen des Filmgeschäfts – von David Bennent, dem Schauspieler des *Oscar* in der Verfilmung der *Blechtrommel*, bis zu Jost Vacano, dem Kameramann von Wolfgang Petersons *Das Boot*. Die dritte Gruppe von Teilnehmern im Alter von 14-16 Jahren beschäftigte sich mit dem Thema Filmisches Sehen, recherchierte selbstständig Hintergrundinformationen zu ihren Lieblingsobjekten, animierte Filme und vertonte einen 3-stündigen Stummfilm live vor Publikum.

Unser Kreativteam unterstützte dieses Projekt über die gesamte Laufzeit hinweg mit Workshops zu Interviewtechniken, Schreiben fürs Ohr oder professionelles Sprechen und begleitete die Kinder und Jugendlichen auch bei den Aufnahmen im Studio. Außerdem erstellten wir die Inhalte für erwachsene Individualbesucher, entwickelten ein Fotospiel, gestalteten das UI/UX- sowie Grafik-Design und setzten die App schließlich für Tablet-Anwendungen um.


© DFF



Tap into

# Digital Transformation. Customer Centric Design. Internet of Things. Learning.

Designing New Business

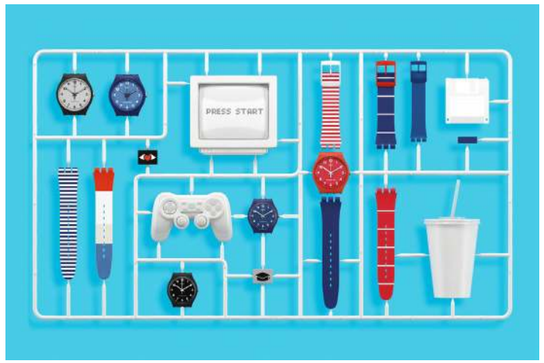
# The Customer as Designer

**TEXT** Nikolaus Franke

Digitalisation is transforming the relationship between manufacturer and customer. For centuries, the roles were clearly divided between these institutions: one produced, while the other consumed. However, the Internet and new flexible production technologies are pushing the boundaries and creating the possibility for new business models in which the customer can become a product designer.

Is this a good idea? This was the question that launched a research project we carried out at the Vienna University of Economics and Business. Through extensive research, we identified the four most successful Swatch-type watch designs. We showed these watches to a group of study participants and asked them how much they were willing to pay for them. The average price was €24.25. At the same time, we gave a second group the opportunity of designing their own watch online using a digital configuration tool. After about 10 minutes they had finished. The functional objective quality of the watches was identical in both groups. The interview conditions were the same. And the composition of the two groups was also identical – there were a total of 413 randomly selected business studies students. The only difference was the design of the watches: In the case of the first group they were the most successful professional designs on the entire market; in the case of the second it was their own designs, that is, the hasty work of amateurs. We were curious: How much would the second group be willing to pay?

We might assume that the participants take into account their time and effort, i.e. they are willing to pay less simply because of the effort they had expended. Even if we focus on just the product itself, the case seems clear: In the first group, the design is the work of professional designers who have training, qualifications and a lot of experience. When they design a watch, it should look a lot better than when non-professionals try designing for the first time. Not only are professionals more talented than the average student, they also put in more effort. They start with various different ideas, then discuss, improve and discard them; then they start again and ultimately through repetition work out the best idea in more detail. This can take weeks. The effort put in by the students, on the other hand, seems downright laughable. And finally, the four professional watches are not just random designs, but those that have won out as the best in competition against thousands of other designs. It would be a miracle if the watches designed by amateurs came even close to the €24.25 at which the professional watches were valued. Or would it?




© Swatch

***"The only difference was the design of the watches: in the case of the first group they were the most successful professional designs on the entire market; in the case of the second it was their own designs, that is, the hasty work of amateurs. We were curious: how much would the second group be willing to pay?"***



© Stephan Huger

Nikolaus Franke

Director of Institute for Entrepreneurship & Innovation, Vienna University of Economics and Business (AT)

***"As far as the relationship between manufacturer and customer goes, this means that a tectonic shift has begun. Gone are the days when there was a clear separation between manufacturers and their customers."***

In fact, however, the amount people were willing to pay for the watch designed themselves using a digital toolkit was not lower, but on the contrary, *exactly twice as much*, namely €48.50. How can this be? It looks at first glance like the claim that a junior player could crush the professional footballers of Real Madrid 10-0. So we repeated the experiment with two new groups. This time, however, we did not use an interview to assess how much the 304 participants were willing to pay, but rather an incentive-based auction process. We asked them to bid on each watch and told them in advance that we would then draw a random price. If this price was higher than their bid, they wouldn't get the watch. If this price was higher, then they would be obliged to buy the watch for that exact price. If you think about it for a moment, you will see that the best strategy in this situation is to fix your bid so that it corresponds to the maximum price you are willing to pay. The participants completely understood this principle, which was reflected in the lower values compared to the first experiment. There is indeed a difference between answering a question without obligation and actually having to open your wallet and keep to your word! What remained, however, was the difference. An average of €7.82 was bid for the professional watches, and €15.50 for the self-designed watch – again a difference of around 100%. We also repeated the experiment with other products, from skis to muesli to fitted kitchens. Without exception, the value of their own design was significantly higher than that of the professional designs.

In a series of further experiments, we explored the reasons why one's own design creates such a high level of added value. The first factor is the possibility of creating something that is precisely adapted to one's own needs and taste. A standard product inevitably means a compromise. By contrast, if you design something yourself, you can make your own decisions. The second factor is the uniqueness of the product. Distinguishing oneself from others has become a basic need in an era of unlimited digital reproducibility. The third factor can also be explained by the way of life in a post-industrial society, which is no longer acquainted with manual labour and in which Marx's Alienation has long since become a matter of course. It is the desire to create something yourself, to be an author, a creator. It is almost ironic that it is of all things digitalisation that is helping us to satisfy this primal human need for self-actualisation.

As far as the relationship between manufacturer and customer goes, this means that a tectonic shift has begun. Gone are the days when there was a clear separation between manufacturers and their customers. The development of the digital toolkit will continue. Design, creation and innovation will become easier and more intuitive; the designers of the future will be the customers. Compared to today, products will be much more individual, more diverse and tailored to the needs of the customer in a much more profound way. In just a few years we will be as astonished at our present situation and the relative uniformity of many products as we are today at the identical shoes worn by Napoleon's army: for cost reasons, Napoleon equipped his armies with shoes that were all the same size. Regardless of the soldier's shoe size, everyone got the same shoe, and even the left and right shoes were identical. Amazing? Yes, and our grandchildren will say the same about our era.

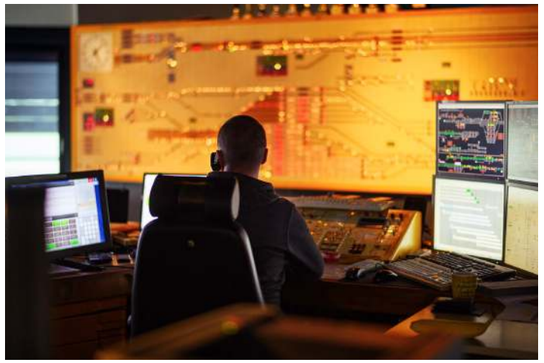
© Swatch

# Innovation Partner

## Austrian Federal Railways

**CLIENT**
Rail Cargo Group / ÖBB Personenverkehrs AG / BCC (Business Competence Center)

**LOCATION**
Vienna, Austria



© David Payr / provided by ÖBB

NOUS has been a partner of the Austrian Federal Railways (ÖBB) for more than ten years. During this time we have worked with the IT teams of Austria's largest rail operator on the design, prototyping, and implementation of ticketing solutions, industry-specific project management solutions, and digital assistants such as *MIKE* for freight or *GMEP* for construction site planning. NOUS offers particular support in the staffing and recruiting of the often large teams and the adoption of state-of-the-art agile project management methods. Here, NOUS works with the client to analyse complex processes and develop style guides, company-wide UI/UX concepts, and digital information and system architectures. The resulting technological solutions support the ÖBB in the areas of employee safety, punctuality, efficiency, and quality assurance, while customers benefit from new programmes such as *Smart Journey* and detailed real-time information.

Seit mehr als zehn Jahren ist NOUS Partner der ÖBB: Gemeinsam mit den IT-Teams von Österreichs größtem Eisenbahnunternehmen wurden und werden etwa die Ticketinglösung, branchenspezifische Projektmanagementlösungen oder für Railcargo digitale Assistenten wie *MIKE* oder *GMEP* zur Baustellenplanung mitkonzipiert, prototypisiert und umgesetzt.

Eine große Herausforderung liegt dabei im von NOUS unterstützten Staffing und Recruiting für die teilweise großen Teams, die mittels zeitgemäßer Methoden des agilen Projektmanagements agieren. Hierzu analysiert NOUS gemeinsam mit dem Kunden komplexe Abläufe und entwickelt daraus Styleguides, unternehmensweite UI/UX-Konzepte, sowie digitale Informations- und Systemarchitekturen.

Die daraus entwickelten Technologien unterstützen die ÖBB in den Bereichen Mitarbeiterinnen-Sicherheit, Pünktlichkeit, Effizienz und Qualitätssicherung – Endkunden wiederum profitieren von neuen Programmen wie *Smart Journey* oder detaillierten Echtzeitinformationen.



# ORF ON – Comprehensive, Accessible, Enjoyable

## Austrian Broadcasting Corporation – ORF

**CLIENT**
Austrian Broadcasting Corporation – ORF

**LOCATION**
Vienna, Austria


© ORF

Since 2010, NOUS has been leading the development of all ORF apps for Android, iOS, Apple TV, Android TV, and Amazon Fire TV.

The newly launched streaming platform ORF ON, released in 2024, replaces the ORF TVThek, which had been in place since 2018. ORF ON offers Austria's most popular TV content both live and on-demand, including ORF originals and archival treasures. The live stream offering includes new 24-hour timeshift and restart functions, and the video content is organized into clear categories. A live lane provides updates on currently running streams. New features include personalisation options via login and extended availability of content. Accessibility has also been enhanced: more than 50% of the programmes offer subtitles, audio descriptions, or Austrian Sign Language.

The cross-company development and user testing were organized by NOUS using Scrum method. Ongoing consulting, support, and development continue to be provided. Overall, ORF ON serves as ORF's digital flagship store, making Austria's key TV content personally accessible through its apps.

Seit 2010 ist NOUS für den ORF federführend in der Entwicklung aller Apps für Android, iOS, Apple TV, Android TV oder Amazon Fire TV tätig.

Die 2024 neu veröffentlichte Streaming-Plattform ORF ON löst die seit 2018 bestehende ORF TVThek ab und bietet die beliebtesten TV-Inhalte Österreichs sowohl live als auch on-demand, darunter ORF-Originale und Schätze aus dem Archiv. Das Live-Stream-Angebot verfügt unter anderem über neue 24-Stunden-Timeshift- und Restart-Funktionen, der Video-Content wurde in übersichtlichen Rubriken organisiert, eine Live-Lane informiert weiterhin über die aktuell laufenden Streams. Neu hinzu kam eine Personalisierungsmöglichkeit über Login sowie eine längere Abrufbarkeit, zugleich wurde die Barrierefreiheit ausgebaut: Mehr als 50% der Sendungen bieten Untertitel, eine akustische Bildbeschreibung oder Österreichische Gebärdensprache.

Die firmenübergreifende Entwicklung sowie das User-Testing wurde von NOUS mittels Scrum-Methode organisiert – Beratung, Betreuung und Weiterentwicklung werden kontinuierlich fortgesetzt: Insgesamt versteht sich ORF ON somit als digitaler Flagshipstore des ORF, über dessen Apps die wichtigsten TV-Inhalte des Landes personalisiert erlebbar sind.

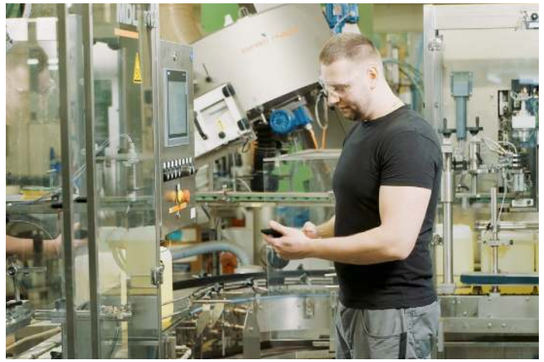

© ORF

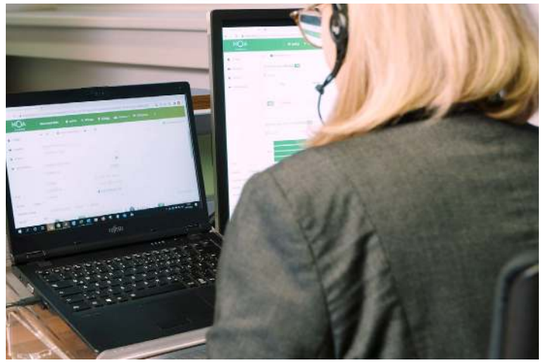
# Digital Process Manager

## hollu Systemhygiene

**CLIENT**
hollu Systemhygiene GmbH

**LOCATION**
Zirl, Austria



© hollu Systemhygiene

Together with hollu Systemhygiene GmbH, NOUS has developed the cross-industry digital process manager NOA over the last six years with the goal of combining tasks and processes, knowledge building and transfer as well as the topic of (legal) security in one application. For the hygiene and cleaning sector, but also far beyond.

This is achieved by directly connecting customers with their employees from the hotel and catering, property management, health and social services or industry sectors. In the multilingual native user app, service or work processes are designed step by step in NOA on the provider side and documented and confirmed on the implementation side. The IoT connection helps to identify optimisation potentials and to enable a material- and resource-saving way of working. A digital training and further education offer, as well as real-time monitoring via dashboards, compete the offer.

All in all, NOA helps to achieve greater efficiency, consistently high quality and maximum legal certainty through digitalisation in process management. This means significant time savings, provides clarity and transparency and enables management at the height of time.

Gemeinsam mit der hollu Systemhygiene GmbH entwickelte NOUS über die letzten sechs Jahre den branchenübergreifenden digitalen Prozessmanager NOA – mit dem Ziel, Aufgaben und Prozesse, Wissensaufbau und -transfer sowie das Thema (Rechts-)sicherheit in einer Anwendung zusammenzuführen. Für den Bereich Hygiene und Reinigung, aber auch weit darüber hinaus.

Erreicht wird dies durch die direkte Verbindung der Kundinnen mit deren Mitarbeitern aus den Bereichen Hotel und Gastronomie, Objektbetreuung, Gesundheits- und Sozialwesen oder Industrie. So werden in der mehrsprachigen nativen Anwender-App schrittweise Service- oder Arbeitsabläufe in NOA anbieterseitig konzipiert und umsetzungsseitig dokumentiert und bestätigt. Die IoT-Anbindung hilft, Optimierungspotentiale zu erkennen und eine material- und ressourcenschonende Arbeitsweise zu ermöglichen. Ein digitales Schulungs- und Weiterbildungsangebot, sowie Echtzeitmonitoring über Dashboards runden das Angebot ab.

In Summe verhilft NOA durch Digitalisierung im Prozessmanagement zu mehr Effizienz, einer gleichbleibend hohen Qualität und maximaler Rechtssicherheit. Dies bedeutet eine erhebliche Zeitersparnis, sorgt für Klarheit und Transparenz und ermöglicht Management auf Höhe der Zeit.



# Financial Education Made Easy

## Central Bank of Austria

**CLIENT**
Oesterreichische Nationalbank

**LOCATION**
Vienna, Austria

For many years, the Central Bank of Austria (OeNB) has pursued the goal of strengthening the financial literacy of the Austrian population and imparting financial education: Building on our m€ins app developed for adults in 2020, this knowledge is now also being passed on to 9-12 year olds with the meiki app.

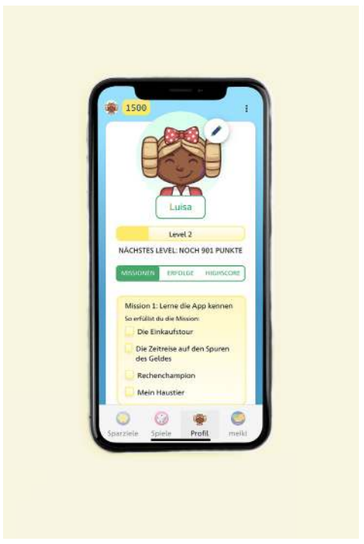
In a co-creation workshop with the OeNB team and the Federal Ministry of Education, we developed solutions to help children acquire basic financial skills, such as achieving a set savings goal. This is stimulated by playful approaches such as a virtual piggy bank or a who-becomes-a-millionaire quiz.

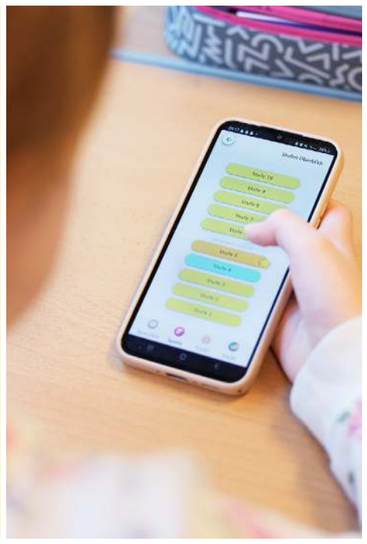
NOUS developed the basic concept, the design and the game mechanics to a hybrid app: As an official teaching tool, the application should also have links to the primary and secondary school curriculum.

Die Österreichische Nationalbank (OeNB) verfolgt seit vielen Jahren das Ziel, die Finanzkompetenz der österreichischen Bevölkerung zu stärken und finanzielle Bildung zu vermitteln: Aufbauend auf unserer 2020 für Erwachsene entwickelten m€ins-App wird dieses Wissen mit der meiki App nun auch an 9-12-Jährige weitergegeben.

Im Rahmen eines Co-Creation-Workshops mit dem Team der OeNB und dem Bundesministerium für Bildung erarbeiteten wir Lösungen, Kinder dabei zu unterstützen, grundlegende Finanzkompetenzen zu erlangen, etwa ein gesetztes Sparziel zu erreichen. Angeregt wird dies durch spielerische Ansätze wie z.B. einem virtuellen Sparschwein oder einem Wer-wird-Millionär-Quiz.

NOUS entwickelte dazu das Grundkonzept, das Design und die Spielemechanik zu einer hybriden App: Als offizielles Lehrmittel ausgerichtet, soll die Anwendung auch Anknüpfungspunkte an den Lehrplan für Grundschule sowie Sekundarstufe haben.



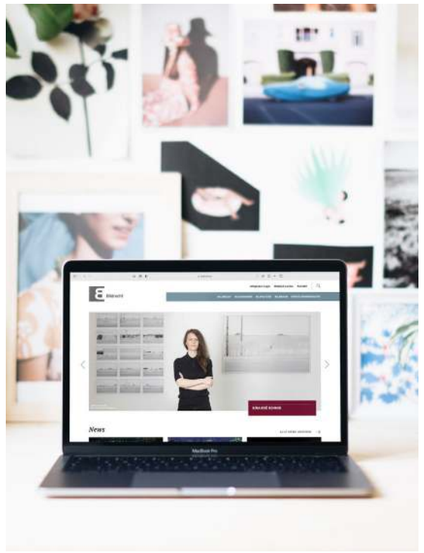
© OeNB Finanzbildung

# Transformation to the Digital

## Bildrecht

**CLIENT**
Bildrecht Gesellschaft zur Wahrnehmung visueller Rechte

**LOCATION**
Vienna, Austria



Bildrecht ist die österreichische Verwertungsgesellschaft für Bildende Kunst, Architektur, Fotografie, Grafik, Illustration, Design, Choreografie und Performance. Sie vertritt die Urheberrechte von rund 5.500 Mitgliedern gegenüber öffentlichen und privaten Stellen, um Einnahmen und Vergütungen zu Gunsten der Kunstschaffenden geltend zu machen.

NOUS zeichnet für den Relaunch der Bildrecht-Webseite verantwortlich – neues Design, neues Konzept wie eine mobile Variante wurden erfolgreich umgesetzt. Die Webseite beinhaltet als Plattform rechtliche und künstlerische Komponenten und bindet neue Features wie etwa Antragsformulare für Bildnutzer oder einen Folgerechtsrechner mit ein. Neben digitalen Ausstellungsräumen ist ein Ausstellungsarchiv ebenso auf der Webseite inkludiert wie eine Übersicht über die aktuellsten Einreichungsmöglichkeiten für Kunstpreise.

In einer mehrjährigen Phase der Prozesstransformation haben wir Bildrecht zudem dabei unterstützt, die Meldungen und Abrechnungen der Mitglieder vollständig digitalisiert abzuwickeln: Auf der KI-unterstützten Plattform können sich Mitglieder neu anmelden und ihre individuellen Rechte und Vergütungsansprüche melden. Innerhalb des von NOUS mitgestalteten Verwaltungsprozesses werden die individuellen Ansprüche mittels spezifischer Berechnungen angepasst oder die Ausschüttungen der entsprechenden Vergütungen durchgeführt. Den Mitgliedern ist es damit möglich, den jeweils aktuellen Stand ihrer Meldungen und Ausschüttungen einzusehen, wodurch die Transparenz vor dem Gesetz gegeben ist.

© Milva Stutz, Nicoleta Auersperg (detail), Maja Gehrig (filmstill) / Bildrecht Wien

Bildrecht is the Austrian collecting society for visual arts, architecture, photography, graphics, illustration, design, choreography and performance. It represents the copyrights of around 5,500 members to public and private bodies in order to claim income and remuneration for the benefit of the artists.

On the one hand, NOUS is responsible for the relaunch of Bildrecht's website – new design, new concept such as a mobile version were successfully implemented. As a platform, the website contains legal and artistic components and integrates new features such as application forms for image users or a resale right calculator. In addition to digital exhibition spaces, an exhibition archive is also included on the website, as is an overview of the latest submission options for art prizes.

In a phase of process transformation lasting several years, we also supported Bildrecht in processing the reports and accounts of the members completely digitally: Members can register on the AI-supported platform and report their individual rights and compensation claims. Within the administrative process designed by NOUS, the individual claims are adjusted using specific calculations or the distribution of the corresponding remuneration is carried out. It is thus possible for members to view the current status of their reports and distributions, which ensures transparency before the law.

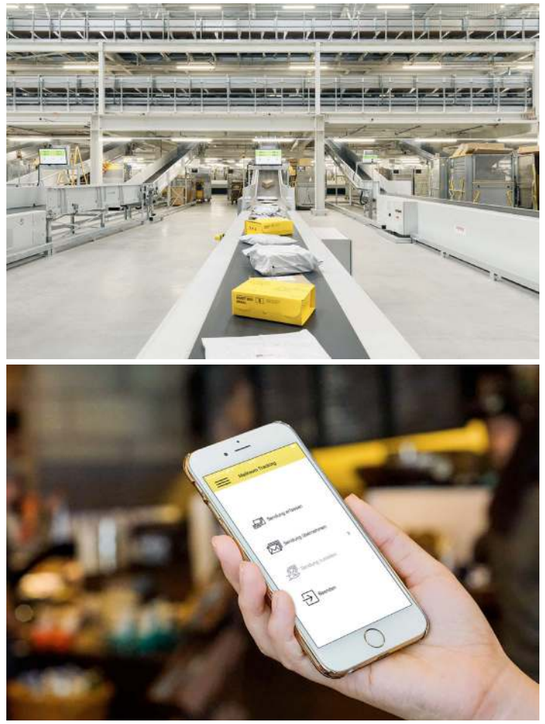


# Efficient Mail Processing

## Post Business Solutions

**CLIENT**
Österreichische Post AG

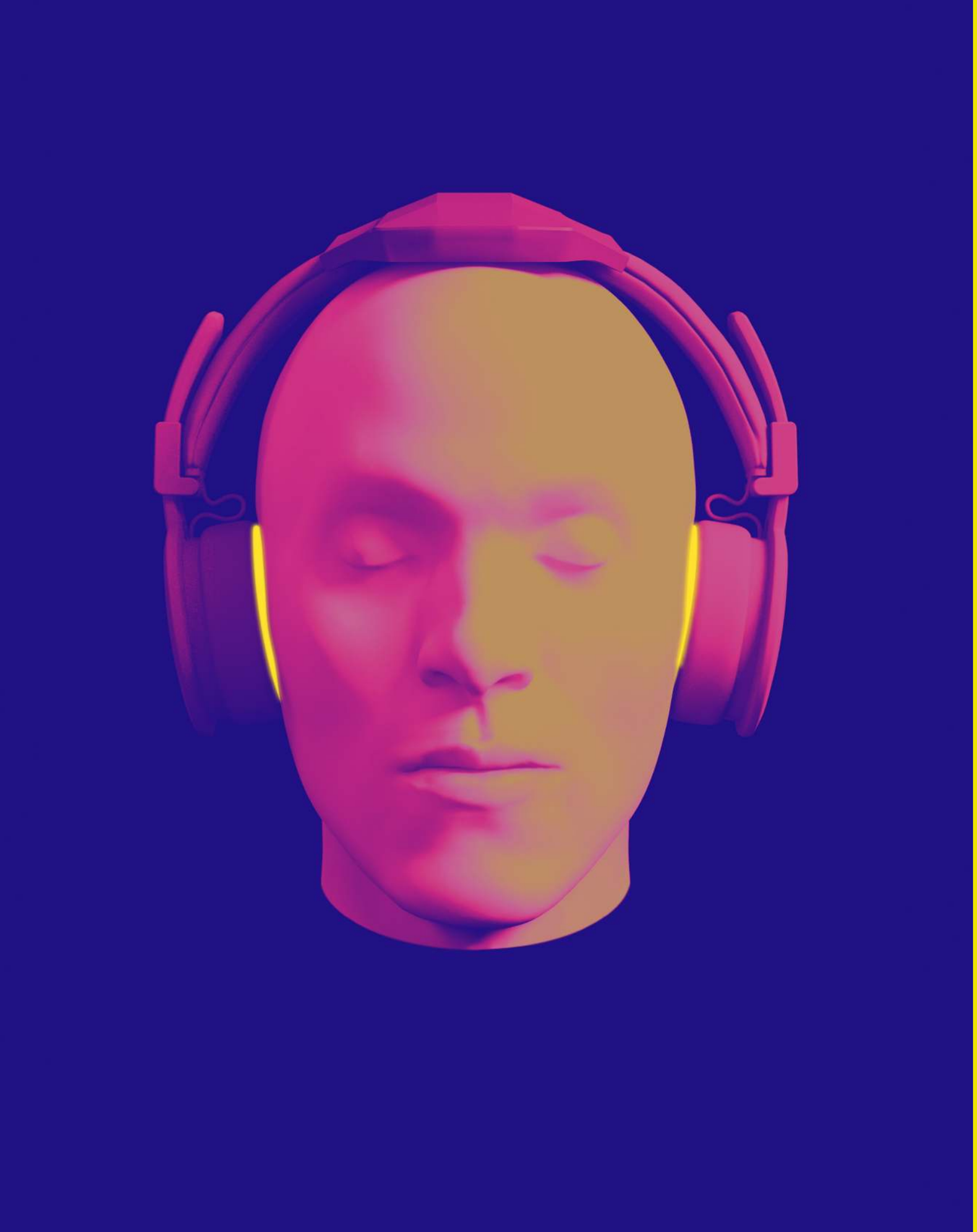
**LOCATION**
Vienna, Austria



© Österreichische Post AG

Since 2019, we have been supporting Post Business Solutions in successful implementations in the field of Digital Transformation of mail and dispatch processes. The apps Mailroom Tracking and Object Tracking developed by NOUS are parts of an overall system for digital document management: automated mail distribution allows time-saving as well as data-safe processing and handling of all postal traffic. Incoming mail is scanned, distributed internally to digital mailboxes and recipients are notified automatically – the item can be picked up with a personal QR code and each of its movements is tracked. At the same time, individual rights assignment and dynamic watermarks ensure the highest possible level of data protection. In the spirit of applied Digital Transformation, NOUS is thus making a further contribution to the digitisation of complex business processes, as it has done for ÖBB, hollu Systemhygiene and Bildrecht.

Seit 2019 unterstützen wir Post Business Solutions bei erfolgreichen Umsetzungen im Feld der digitalen Transformation von Post- und Versandprozessen. Die von NOUS entwickelten Apps Mailroom Tracking und Object Tracking sind Teile eines Gesamtsystems zu digitalem Dokumentenmanagement: Automatisierte Postverteilung erlaubt eine zeitsparende wie datensichere Bearbeitung und Abwicklung des gesamten Postverkehrs. Postalische Eingänge werden gescannt, intern in digitale Postfächer verteilt und die Empfänger automatisiert benachrichtigt – die Sendung kann mit einem persönlichen QR-Code abgeholt werden, jede ihrer Bewegungen wird getrackt. Dabei gewährleisten individuelle Rechtevergabe und dynamische Wasserzeichen höchstmöglichen Datenschutz. Ganz im Sinne angewandter digitaler Transformation leistet NOUS damit wie bei ÖBB, hollu Systemhygiene oder Bildrecht einen weiteren Beitrag zur Digitalisierung komplexer Geschäftsprozesse.



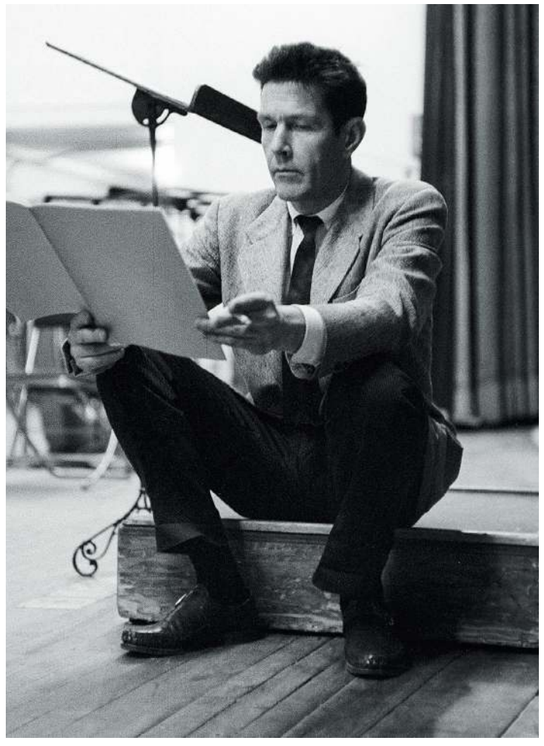
Tap into

# Immersive Audio.
# Interaction.
# Audio Art.
# Spatialisation.

Future Listening

# The Room as an Instrument

TEXT Gunther Reisinger



© Ben Martin/ Getty Images

In *Spook Country* (2007)[1], William Gibson still had fictitious artists to anchor virtual works in three-dimensional spaces using spatial coordinates. Gibson's protagonists were able to see these works with special devices at their respective positions in space.

Those AREAS – that give our projects its name – are defined in form and place by Christian Fennesz with NOUS Sonic, positioned on a digital representation of the Theatre of the Austrian Cultural Forum New York and covered with specially composed sound files. When the participants enter these areas within the Theatre, they hear individual sounds through headphones, depending on their location and behaviour: The technological basis is a high-precision indoor localisation of the listeners using ultra-wideband, the sounds are calculated and adjusted in real time in the respective headphones.

## NON-LINEARITY

The space is thus recognized in detail in its real three-dimensional structure – as well as the listeners in their movements: Based on this technological setting and using his style-defining mixture of field recordings, guitar snippets, ambient, noise and effects, Fennesz develops an interactive and immersive multi-channel installation.

As in 1997 with Hotel Paral.lel he again performs compositional-conceptual pioneering work with AREA: For example, dealing with the dimension of linear temporality – which has always been regarded as constitutive for music – is made possible by controlling of the individual auditory, changed through own movements in the direction of a non-linear, multi-perspective space-hearing.

## AUGMENTED LISTENING

In his quiet pieces like 4'33", John Cage abstracted the given spatial sound (e.g. the noise generated by the audience) as the music of this piece and thus defined the room in its auditory naturalness as the work of art: With NOUS Sonic the human hearing is augmented in the original meaning. The system not only captures the macro-movements of the audience in the essentially silent space (walking through the virtual areas in the Theatre of the Austrian Cultural Forum New York), but also their micro-movements in the form of individual head turns and thus directions of gaze. If the observed AREA is laid out appropriately, actually inaudible (because it is too far away in the natural) can be simulated as audible: similar to the natural sound sources, Fennesz also positions the virtual sound sources in the room in AREA and can thus both imitate the natural and evoke the unnatural: As a partly irritating result, the listeners wander through their respective auditory uncanny valley.

Gunther Reisinger

Head of Research Projects & Funding, NOUS Digital (AT), Senior Lecturer, University of Technology Graz (AT)

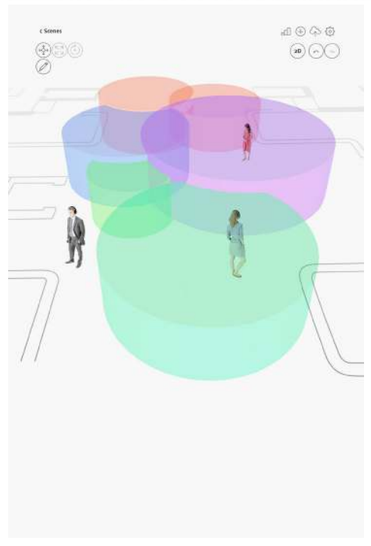
## VARIABLE PREMISES

Space is constituted ontologically not only by the visible, but also by the audible: filled with sound, the size of the room or the nature of the room can be assessed with closed eyes. Our sense of space can thus be influenced by changes in physical auditory laws: Up-down or near-far could be changed auditory contrary to the actual conditions and thus the perception of space could be inverted. In the case of Fennesz' AREA, immersion is thus taken further: In the early stages of corresponding efforts, it was about imitating and expanding nature as the archetypal form of immersion (synaesthetic approaches in Skrijabin 1915 or early digital implementations in Char Davies 1995). Fennesz now has artistically redefined the spatial variables perceived by hearing in AREA, which has been primarily visual, in comprehensive virtual reality systems[2], based on its immanent spatial and personal orientation: How big is a room, what is it like? Where am I, where have I been?

## AUDITORY CURATED ROOMS – THE ROOM AS AN INSTRUMENT

Fennesz sees NOUS Sonic less as another electronic tool, but rather as a conceptually applicable overall system to enable the participants to design their individual auditory spatial perceptions.

The artist thus uses the space as an additional instrument; the AREAS and what is audible within would be the strings of this instrument, which are made to sound in the headphones by individually traversing the three-dimensional shapes: chordal playing possibilities through crossfading of the areas included.



## FOOTNOTES

1 William Gibson, Spook Country, New York 2007

2 Synaesthetic Syntax, conference, Ars Electronica, Linz 2020

# AREA – Fennesz plays NOUS Sonic

## Konzerthaus Wien & Austrian Cultural Forum New York

**CLIENT**
WIEN MODERN Festival / Austrian Cultural Forum New York (ACFNY)

**LOCATIONS**
Konzerthaus Wien, Austria / ACFNY, USA

**PARTNERS**
Christian Fennesz, Wirtschaftsagentur Wien, WIEN MODERN, ACFNY

© David Plakke / Austrian Cultural Forum New York

With his new composition AREA, the internationally renowned Austrian electronic musician Fennesz creates space-specific, three-dimensional sound areas, virtual listening landscapes, which can be individually influenced and explored by the audience via our interactive headphone system NOUS Sonic.

The precise recording of the participants' position, movement or line of sight allows Augmented Listening and spatial experience audible, one is immersed in technically refined extended and auditory perceptions.

Fennesz hereby uses sound to intensify the relationship between the visitor and the artwork and to realize it together with the audience. The individual-multi-sensory experience thus stands as a totality in the foreground of an immersive spatial composition, the room becomes the instrument.

Der international renommierte österreichische Elektronik-Musiker Fennesz kreiert mit seiner Neukomposition AREA raumspezifische, dreidimensionale Soundareale, virtuelle Hörlandschaften, die vom Publikum über unser interaktives Kopfhörersystem NOUS Sonic individuell beeinflusst und erkundet werden können.

Durch präzise Erfassung von Position, Bewegung oder Blickrichtung der Teilnehmerinnen wird ein immersives Klang- und Raumerlebnis erhörbar, über Augmented Listening taucht man in technisch raffiniert erweiterte Raum- und Hörwahrnehmungen ein. Fennesz nutzt Klänge hiermit, um die Beziehung zwischen dem Besucher und dem Kunstwerk zu intensivieren und dieses gemeinsam mit dem Publikum zu realisieren. Die individuell-multisensorische Erfahrung steht damit als Gesamtheit im Vordergrund einer immersiven Raumkomposition, der Raum wird zum Instrument.

© Ruppert Steiner



# Fairy Tales in a Third Dimension

## Hans Christian Andersen Museum

**CLIENT**
City of Odense

**LOCATION**
Odense, Denmark

**PARTNER**
Event Communications

The Hans Christian Andersen Museum in Odense, which was designed by the Japanese architect Kengo Kuma and opened in 2021, aims to introduce the visitor to Andersen's work on a very individual level. To this end, the museum offers an artistically holistic experience that combines landscape, architecture, and modern exhibition design as a means of providing new perspectives on one of the most beloved and creative thinkers in world literature. With an exhibition concept that appeals to all the senses and a fairytale-like blending of reality and fiction, the museum offers not so much a historical overview of Andersen's work as a journey into the world of his imagination. To make this journey possible, our ecosystem NOUS Sonic was integrated into the curatorial concept from the very beginning and thus became an essential part of the exhibition. NOUS Sonic equips visitors with special headsets that enable them to literally immerse themselves in Andersen's life and stories and connect these with their own imagination. This is made possible by highly precise positioning, which allows audio to be played with pinpoint accuracy. Visitors also interact with media such as video, projections, and other installations as they individually explore and listen to – and are delighted and surprised by – the three-dimensional acoustic world that is created in real time within the exhibition space.

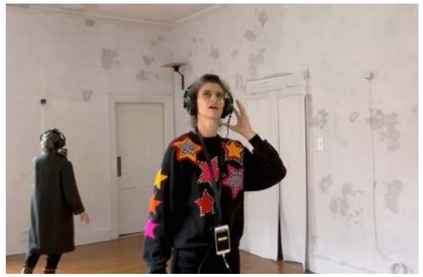
Das vom japanischen Architekten Kengo Kuma entworfene und 2021 eröffnete Hans Christian Andersen Museum in Odense hat sich zum Ziel gesetzt, sowohl Andersens Werk wie auch dessen Leben individuell erlebbar zu machen. Dazu bietet das Museum ein künstlerisch-gesamtheitliches Erlebnis, das Landschaft, Architektur und moderne Ausstellungsgestaltung verbindet und damit neue Perspektiven auf einen der beliebtesten und kreativsten Denker der Weltliteratur ermöglicht.

Mit einem alle Sinne ansprechenden Ausstellungskonzept und einer märchenhaften Vermengung von Realität und Fiktion bietet das Museum weniger einen historischen Überblick über Andersens Schaffen als vielmehr eine Reise in dessen persönliche Gedankenwelt: Um diese Reise zu ermöglichen, wurde unser Ecosystem NOUS Sonic von Anbeginn in das kuratorische Konzept eingebunden und damit integraler Bestandteil der Ausstellung. NOUS Sonic ermöglicht den Besucherinnen mittels spezieller Headsets in das Leben und in die Erzählungen Andersens sprichwörtlich einzutauchen und diese mit ihrer eigenen Fantasie zu verbinden.

Ermöglicht wird dies durch eine hochgenaue Ortung, wodurch Audios punktgenau abgespielt werden; die Besucher interagieren zudem mit Medien wie Video, Projektionen und anderen Installationen. In Echtzeit wird innerhalb des Ausstellungsraumes eine dreidimensionale akustische Welt geschaffen, die von den Besucherinnen individuell erkundet und erhört werden kann, eine Welt, die gleichzeitig erfreut und überrascht.

# Multiple Facets of Sound

## Harvestworks

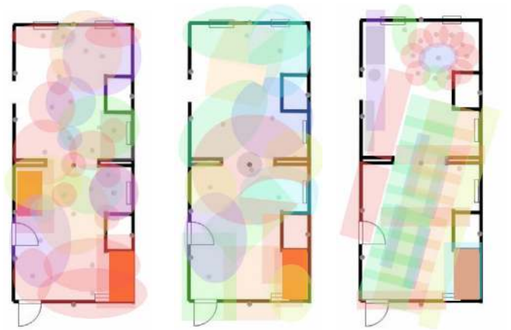


© Harvestworks

**CLIENT**
Harvestworks – Digital Media Arts Center

**LOCATION**
Governors Island, New York City, USA

**PARTNER**
JER (Jaffé – Edelstein – Reeder)



NOUS Sonic Configurator © Edelstein, Jaffé, Reeder

In New York City, we supported the well known artist trio JER, Michelle Jaffé, Phil Edelstein and David Reeder, with NOUS Sonic to realize their sound-immersive artwork LocaleS3, presented at Harvestworks in Governors Island.

LocaleS3 is sound as kinetic plastic sculptural material formed with the dynamic properties of location, size, direction, motion, movement. In a dark room, JER animates and orchestrates interactive sound objects, virtual and/or physical, with vocalisations, distributed in space. Visitors become involved accomplices playing the room as an instrument, through the use of smartphones and positiontracking headphones.

A precept of LocaleS3 is the use of sound production techniques to present multiple facets of the work simultaneously. JER creates an audio experience which is analogous to seeing 3D sculpture in the round; giving visitors, multiple listening points to hear sonic objects, from different perspectives.

LocaleS3 is the first of scalable modules, using the NOUS Sonic technology with the goal is to discover limits and exploit interstices beyond what they were originally designed for. The artwork therefore creates permutations for the solo listener, duets, triads, groupings and communities.

In New York City unterstützten wir das bekannte Künstlertrio JER – Michelle Jaffé, Phil Edelstein und David Reeder – mit NOUS Sonic bei der Realisierung des klangimmanenten Kunstwerks LocaleS3, das bei Harvestworks auf Governors Island präsentiert wird.

LocaleS3 verwendet Klang als kinetisches, plastisches, skulpturales Material, das mit den dynamischen Eigenschaften von Ort, Größe, Richtung und Bewegung agiert. In einem dunklen Raum animiert und orchestriert JER interaktive Klangobjekte, virtuell und/oder physisch, etwa über im Raum verteilte Vokalisationen. Die Besucher werden durch den Einsatz von NOUS Sonic und dessen genauer Positionsbestimmung zu aktiven Mitwirkenden, die ihrerseits den Raum als Instrument spielen.

Ein Grundsatz von LocaleS3 ist demnach die Verwendung von technikimmanenten Klangproduktionstechniken, um mehrere Facetten des Werks gleichzeitig zu präsentieren. JER schafft damit eine Audioerfahrung, die dem Betrachten einer 3D-Skulptur in Allansichtigkeit gleicht: Mehrere Hörpunkte werden angeboten, um die Klangobjekte aus verschiedenen Perspektiven wahrzunehmen.

LocaleS3 versteht sich als das erste skalierbare Modul, das gezielt die Grenzen von NOUS Sonic auslotet und sowohl technologische wie auch künstlerische Zwischenräume ausnutzt. Das Kunstwerk schafft damit immersive Klangerlebnisse für die einzelnen Hörerinnen, Duette, Dreiklänge, Gruppierungen und größere Gemeinschaften.



# Knowledge Beyond Books

## National Library of Wales

**CLIENT**
National Library of Wales

**LOCATION**
Aberystwyth, Wales, Great Britain

**PARTNER**
Sarner International Ltd


The heart of the seaside town Aberystwyth hosts the largest library in Wales, holding more than 6.5 million books and extensive collections of archives, portraits, images and maps. In celebration of the Welsh heritage and life, the National Library of Wales has opened The Wales Broadcast Archive consisting of a collection of over a century of the nation's biggest events on radio, television, and film. Equipped with NOUS Sonic, visitors immerse themselves and dive deep into the history of Wales through extensive amounts of archival material. Thanks to the precise and accurate localisation and positioning system within NOUS Sonic, we have managed to synchronise and coordinate a big amount of video and audio clips, some very close to each other, to create a remarkable three-dimensional soundscape. Archival clips e.g. of the spectacular Welsh Rugby Grand Slams take the visitors on a captivating journey through important points in the Welsh life and heritage.

The permanent exhibition in the South Reading Room was thus equipped by NOUS with a subtle archival immersion experience: With the result of a reinterpretation of the term library in the direction of a multimedia knowledge space.

Im Herzen der Küstenstadt Aberystwyth befindet sich die größte Bibliothek von Wales, die mehr als 6,5 Millionen Bücher und eine umfangreiche Sammlung von Archiven, Porträts, Bildern und Karten umfasst. Um das walisische Erbe und Leben zu würdigen, hat die National Library of Wales das Wales Broadcast Archive der Öffentlichkeit zugänglich gemacht, das aus einer Sammlung von über einem Jahrhundert der größten Ereignisse des Landes in Radio, Fernsehen und Film besteht. Ausgestattet mit NOUS Sonic können die Besucherinnen in die Geschichte von Wales eintauchen und diese anhand von umfangreichem Archivmaterial nachvollziehen. Dank des präzisen und genauen Lokalisierungssystems von NOUS Sonic ist es uns gelungen, eine große Anzahl von Video- und Audioclips zu synchronisieren und zu koordinieren – teils in unmittelbarer Nähe zueinander – mit dem Resultat einer immersiven dreidimensionalen Klanglandschaft. Archivclips – etwa von den spektakulären walisischen Rugby Grand Slams – nehmen die Besucher mit auf eine fesselnde Reise durch wichtige Stationen des walisischen Lebens und kulturellen Erbes.

Die permanente Ausstellung im South Reading Room wurde von NOUS mit einer subtilen archivarischen Immersionserfahrung ausgestattet: Mit dem Resultat einer Neuinterpretation des Begriffs Bibliothek in Richtung eines multimedialen Wissensraums.

# Pulse of Time

## Louvre Abu Dhabi

**CLIENT**
DCT Louvre Abu Dhabi

**LOCATION**
Abu Dhabi, United Arab Emirates

**PARTNERS**
Jonathan Morali, Making Waves, Soundwalk Collective

One of the most important museums in the Middle East, the Louvre Abu Dhabi, uniquely combines the cultures of Orient and Occident. A visit to the Louvre is a voyage through 5,000 years of art history – but how can this be brought to life in a single tour? On the basis of a script by the French writer Stéphane Michaka, the composer Jonathan Morali designed an one-hour three-dimensional audio journey that takes visitors from both West and East from Mesopotamia to the modern era. Six internationally acclaimed actors, including Charles Dance and Irène Jacob, lent their voices to the production and, with the help of NOUS Sonic, enable visitors to immerse themselves in three-dimensional and almost cinematic soundscapes that take them beyond the traditional art-historical narrative.

Der Louvre Abu Dhabi ist eines der wichtigsten Museen des mittleren Ostens und verbindet auf einzigartige Weise die Kulturen des Orients mit jenen des Okzidents. Die Ausstellung des Louvre ist ein Parcours durch 5.000 Jahre Kunstgeschichte – doch wie kann diese in einem einzigen Rundgang erlebbar gemacht werden? Nach einem Drehbuch des französischen Schriftstellers Stéphane Michaka entwarf der Komponist Jonathan Morali eine dreidimensionale, einstündige Hörreise, die Besucher aus dem Westen wie aus dem Osten von Mesopotamien bis in die Moderne führt. Sechs international bekannte Schauspieler, darunter Charles Dance oder Irène Jacob liehen der Produktion ihre Stimmen und lassen die Besucher mittels NOUS Sonic in dreidimensionale, immersive, beinahe filmische Klanglandschaften jenseits der traditionellen kunsthistorischen Erzählung eintauchen.

© Victor Besa / The National / © Louvre Abu Dhabi



# The Sound of Silence

## Wettingen Abbey

**CLIENT**
Museum Aargau

**LOCATION**
Wettingen, Switzerland

**PARTNERS**
Dominik Huber & Knut Jensen

The former Cistercian Abbey was built as a place of silence. Nevertheless, sounds, noises and stories concerning the monastery have accumulated over the centuries – first as a monastery and today as a school.

*On the Eighth Day* provides special access to this particular acoustic archive: The cloister and the monk's church become a walk-through soundscape designed by Dominik Huber and Knut Jensen.

Equipped with our NOUS Sonic headsets, visitors immerse themselves in a surprising three-dimensional world of hearing. Accompanied by a voice, they open up an acoustic landscape step by step and meet a variety of people who tell of their connection to Wettingen Abbey: Of work, of prayer, of study. About their attempts to find answers to questions of the past and to find God here.

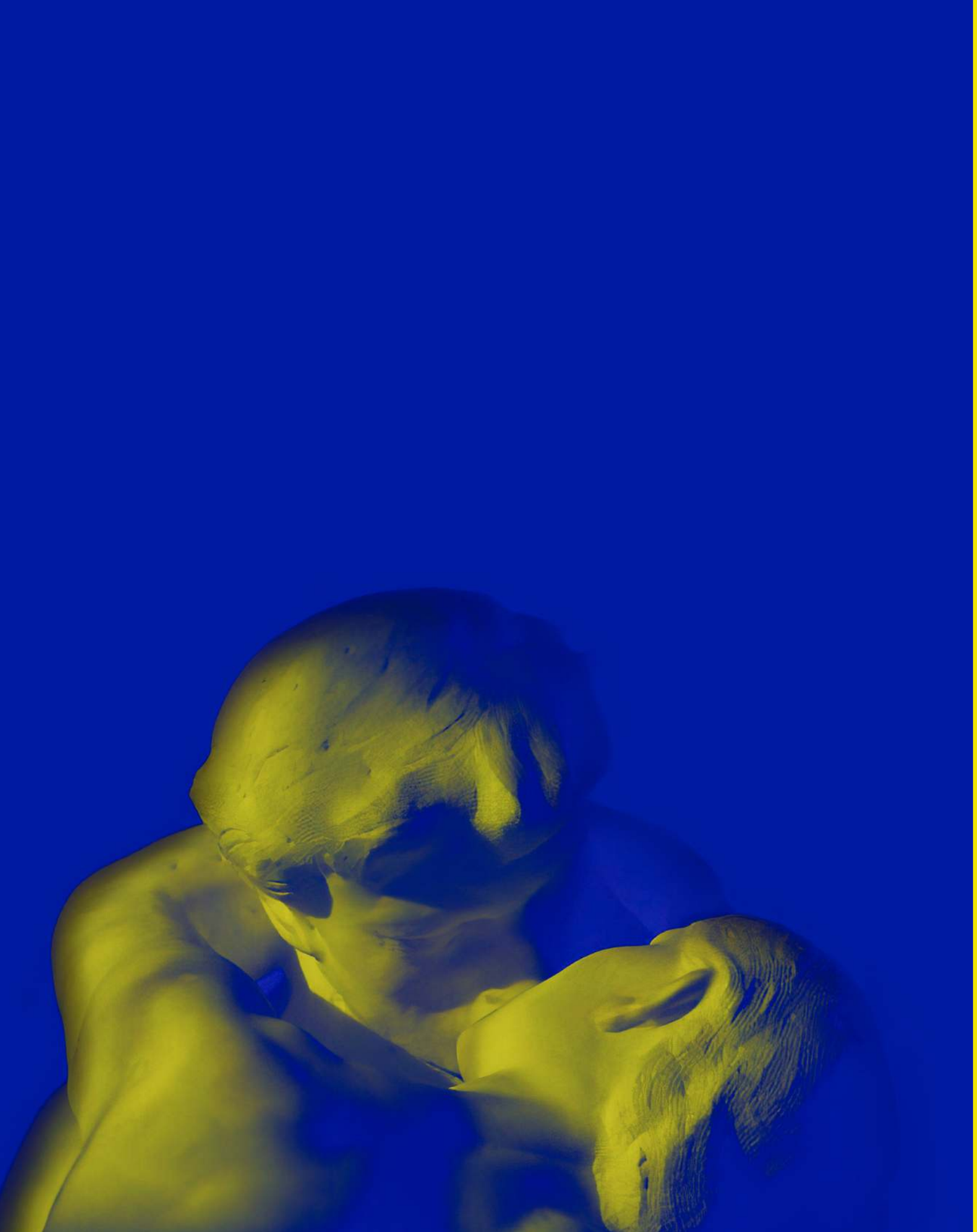
Among many others, a restorer, a pilgrim, a friar and students of the cantonal school tell about the role this special place plays in their lives. Around them, the silent walls, pictures and figures come to life, music from different eras is interpreted on the spot. Made possible by the precise localisation and acoustic three-dimensionality of the NOUS Sonic technology, the real place and the acoustic composition thus merge into a sensually immersive experience.

Die ehemalige Zisterzienserabtei wurde als Ort der Stille gebaut. Dennoch haben sich rund um das Kloster über die Jahrhunderte – zunächst als Kloster und heute als Schule – Geräusche, Klänge und Geschichten angesammelt.

*Am achten Tag* ermöglicht einen besonderen Zugang zu diesem akustischen Archiv: Der Kreuzgang und die Mönchskirche werden zu einer von Dominik Huber und Knut Jensen gestalteten begehbaren Soundscape.

Ausgestattet mit unseren NOUS Sonic-Headsets tauchen die Besucherinnen in eine überraschende dreidimensionale Welt des Hörens ein. Begleitet von einer Stimme, erschließen sie Schritt für Schritt eine akustische Landschaft und treffen auf eine Vielzahl von Menschen, die von ihrer Verbindung zum Kloster Wettingen erzählen: Von der Arbeit, vom Gebet, vom Studium. Von ihren Versuchen, Antworten auf Fragen der Vergangenheit zu bekommen und hier zu Gott zu finden.

Unter vielen Anderen berichten ein Restaurator, ein Pilger, ein Ordensbruder und Schüler der Kantonsschule, welche Rolle dieser besondere Ort in ihrem Leben spielt. Um sie herum werden die stillen Mauern, Bilder und Figuren lebendig, Musik aus verschiedenen Epochen wird vor Ort interpretiert. Ermöglicht durch die präzise Lokalisierung und akustische Dreidimensionalität der NOUS Sonic-Technologie verschmelzen der reale Ort und die akustische Komposition damit zu einer sinnlich-immersiven Erfahrung.



Tap into

# Storytelling. Multiperspectives. Empathy.

The Power of Storytelling

# The Art of Empathy

**TEXT** Eva Wesemann

Eva Wesemann

Global Head of Immersive Experiences, NOUS Digital

What do you do in a museum? Engage with the art and the objects intellectually? Or is a visit to a museum for you primarily a shared experience with friends and family as a kind of entertainment?

If the latter is the case, feel free to admit it. You'll be welcomed with open arms. Because museums and cultural institutions have been redefining their value for a number of years. Today, "value" means more than just economic success, measured by the sale of as many admission tickets as possible, the proceeds of which enable the museum to fulfil its core functions, namely research, collecting, conservation and communication. Rather, museums are increasingly thinking about their social relevance. What can art achieve in an era that's characterized by persecution, migration, extreme opinions and a general drifting apart of society? And what can museums as an institution do to counteract this dynamic?

When it comes to these issues, a definition coined by American sociologist Ray Oldenburg comes to museums' aid. In his 1989 book, *The Great Good Place*, Oldenburg describes a "third place", after home first and workplace second. This "third place" is a public place where people meet together to communicate with each other – it's a place of social interaction. Oldenburg was primarily thinking of cafés, bookshops, bars and hairdressing salons. Museums, however, have discovered the "third place" within themselves and with that a new sphere of relevance. What if, as a public place, they not only served social interaction, but could also be a protected and safe place where people of different ages, backgrounds, religions and beliefs could come together and express their individual perspectives without fear of discrimination? Wouldn't this help to create an increasingly diverse and inclusive society?

Since then, the call for multiple perspectives at all levels of museum work cannot be ignored. Not only are more and more

services being created that appeal to a broad mass of people, in some cases attracting them into the museum for the first time – from yoga, meditation and cooking courses to late-night music events and guided tours for nursing mothers and refugees. At the same time, in digital education services communication and, above all, interaction are the order of the day. Instead of one-dimensional and unidirectional art education services, platforms are emerging that can enable as many people as possible to contribute (e.g. Citizen Science). Almost all programmes for children and young people are being developed by the children and young people themselves. Almost every app is linked to social media where users can leave comments or at least get involved in the conversation. And since the pandemic broke down the four walls of the museum as a "third place" to enter the endless expanse of digital space, the possibilities for social interaction seem limitless. For a long time now, virtual exhibition tours and (live) tours on Instagram have been reaching more people than the "protected place" of the physical museum building. Linking them to "user generated content" is just the next, obvious step.

But hold on a minute! The opportunity of sharing one's own perspective doesn't get us very far, because social interaction involves above all the ability to understand another person's perspective – in other words, the ability to empathize. And museums fulfil this task, too, because they appear to be the ideal place to boost empathy: they own the objects and the associated stories that can stimulate our understanding of other cultures

***"But hold on a minute! The opportunity of sharing one's own perspective doesn't get us very far, because social interaction involves above all the ability to understand another person's perspective – in other words, the ability to empathize."***

But how should they tell these stories? In her book, *We Need to Talk: How to Have Conversations That Matter*, the American journalist and talk-show host Celeste Headlee put it in a nutshell. In the book she describes the ability to listen attentively as an essential prerequisite for real compassion. Only those who really get involved and listen to other people, without formulating a comment in their mind in advance or talking over them with a supposedly similar experience, are able to learn something new and follow what the other person is saying.

Teaching people to listen instead of talking yourself is thus the starting point of every empathy-oriented mediation service. In light of the many technical and interactive possibilities offered by digital media today, analogue storytelling – people just talking to each other – seems almost too simplistic. Surprisingly, however, the demand for storytelling has coincided with a trend towards long-format audio. This means above all podcasts where nothing flashes or lights up the screen, but in which people just talk and are still sometimes able to entrance their listeners for hours.

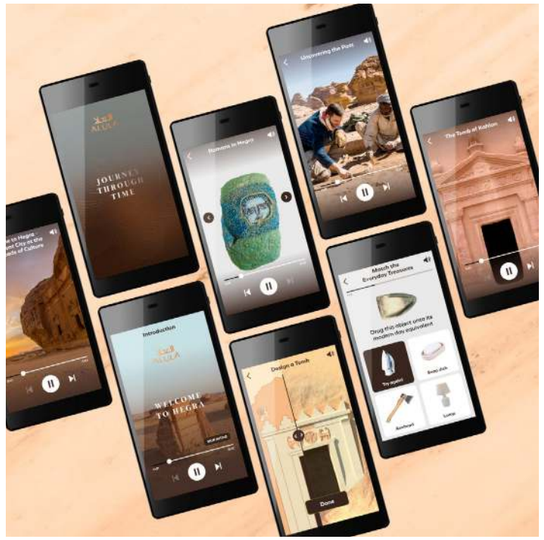
We are also seeing this trend in the digital services offered by museums, namely a movement away from multimedia overkill and back to the spoken word. By contrast with the classic audio tour, which was dominated by curated, didactically formulated and professionally produced content, and which often increased the distance between the viewer and the museum object instead of transcending it, today personal narratives are setting the tone. It's an approach that's also being adopted by the hiStory ecosystem – which NOUS helped develop – and which enables older people to record their memories. They're not professional speakers, but rather real people sharing their point of view in a way that moves us – and people who develop their feelings are well on their way to learning the art of empathy. Suddenly, doors are opening that you only have to step through to enter the "third space" of social interaction.

# Traces in the Sand

## Royal Commission for AlUla

**CLIENT**
Royal Commission for AlUla

**LOCATION**
AlUla, Saudi Arabia




Saudi Arabia has been undergoing rapid social and societal change for several years. Alongside the scientific reappraisal of the hitherto largely unknown region in the northwest of the country, the historical sites around AlUla are gradually being opened up to international tourism. Of the numerous excavations being made accessible to the public, many offer insights into the culture of the Nabataeans, whose empire extended to present-day Jordan. As a content provider, NOUS has designed audio tours for some of these sites, including the oasis of AlUla, Tayma, and Khaybar. By using the voices and sounds of today to tell us about ancient cultures, these tours offer visitors a first introduction to life on one of the most important trade routes, the Incense Route on the Arabian Peninsula.

The immersive audio tours are complemented by multimedia stations in the welcome centers, which provide further information and illustrations to guide visitors on their discovery tour, while a multimedia guide leads them through the impressive archaeological tombs in Hegra.

Saudi Arabien befindet sich seit einigen Jahren in einem raschen sozialen und gesellschaftlichen Umbruch. Einhergehend mit der wissenschaftlichen Aufarbeitung der bisher weitgehend unbekannten Region im Nordwesten des Landes werden nach und nach die historischen Fundstätten rund um AlUla für den internationalen Tourismus erschlossen. Vor allem aus der Nabatäer-Kultur – deren Reich sich bis in das heutige Jordanien erstreckte – werden zahlreiche Ausgrabungen der Öffentlichkeit zugänglich gemacht.

NOUS hat als Content-Provider für einige dieser Stätten, darunter die Oase von AlUla sowie für Tayma und Khaybar, Audiorundgänge gestaltet. Stimmen und Sounds der Gegenwart erzählen über die reichhaltige Geschichte und ermöglichen den Besucherinnen ein einzigartiges Kulturerlebnis entlang der Weihrauchstraße, einer der wichtigsten Handelsrouten auf der arabischen Halbinsel.

Ergänzt werden die immersiven Audiotouren durch Multimediastationen in den Willkommenszentren, die mit weiterführenden Informationen und Illustrationen den Besuchern vor Ort den Weg auf ihrer Entdeckungstour weisen, während ein Multimediaguide durch die imposanten archäologischen Grabstätten in Hegra führt.



# Immersed in Ancient History

## Royal Commission for AlUla

© Kerr McIlwraith (Flint PR)

**CLIENT**
Royal Commission for AlUla

**LOCATION**
Hegra, Saudi Arabia

**PARTNER**
ARtGlass

The collaboration between NOUS and ARtGlass marks the Middle East's first XR tour with smartglasses at Saudi Arabia's famous archaeological Hegra site. This groundbreaking initiative emphasises sustainable tourism, offering a highly immersive exploration of ancient history. The guided tour blends 3D visuals with AR elements, allowing visitors to experience the natural beauty of Hegra while diving into its storied past. Utilizing transparent lenses, guests explore otherwise restricted areas. Alternatively, equipped with a multimedia guide designed by NOUS, participants gain insights into a civilisation that developed at the same time as ancient Rome, Greece and Egypt.

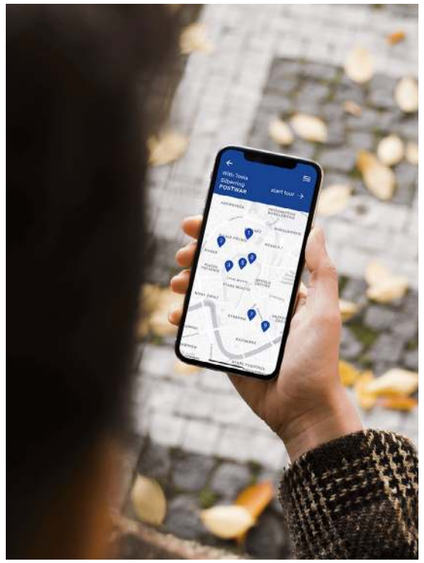
The Royal Commission for AlUla's partnership with NOUS and ARtGlass thus leverages cutting-edge technology to deeply engage visitors, ensuring authentic narratives and a personalized multi-level experience led by knowledgeable guides.

Die Zusammenarbeit zwischen NOUS und ARtGlass an der berühmten archäologischen Stätte Hegra in Saudi-Arabien markiert die erste XR-Tour mit Smart Glasses im Nahen Osten. Die bahnbrechende Initiative betont nachhaltigen Tourismus und erlaubt ein immersives Erleben antiker Geschichte: Durch die Verbindung von 3D-Visualisierungen mit Augmented Reality-Elementen ermöglicht die geführte Tour den Besucherinnen, die natürliche Schönheit von Hegra zu erkunden und gleichzeitig an ihrer beeindruckenden kulturellen Vergangenheit Teil zu haben. Die Nutzung neuester Smart Glass-Technologie erweckt durch Hologramme und interaktive Geschichten ansonsten nicht zugängliche Bereiche zum Leben. Alternativ mit einem von NOUS konzipierten Multimedia Guide ausgestattet, gewinnen die Teilnehmer so Einblicke in eine Zivilisation, die sich zur gleichen Zeit wie das antike Rom, Griechenland und Ägypten entwickelte.

Die Partnerschaft zwischen der Royal Commission for AlUla, NOUS und ARtGlass nutzt demnach Spitzentechnologie, um Besucherinnen mittels authentischer Erzählungen und einem personalisierten, mehrstufigen – von sachkundigen Guides begleiteten – Erlebnis in antike Welten eintauchen zu lassen.

# Touching Stories

## Centropa



**CLIENT**
Centropa – the Central Europe Center for Research and Documentation

**LOCATIONS**
Poland, Austria, Germany, USA

When pictures tell stories, history becomes personal – and touching. Since launching the project *Jewish Witness to a European Century* in 2000, Centropa has digitised more than 1,250 life stories and conducted numerous interviews with the aim of compiling an Oral History. For example, in order to tell the poignant story of Holocaust survivor Tosia Silberring, her memories can be accessed at the appropriate locations in Kraków using a web app. The tour starts at the Galicia Jewish Museum in Kraków. Visitors are given information about the location via their own smartphone: Interviews, rare photographs and documents are available in four languages, while users are led digitally and directed to the various points of interest both inside and outside the museum.

On the three tours, a 2D map serves as a guide, showing all the historical places on each tour. In this way, digital technology enables individual visitors to take part and become contemporary witnesses at site-specific locations, with Oral History serving as a way of keeping memories alive.

Wenn Bilder Geschichten erzählen, wird Geschichte persönlich – und berührt. Seit Beginn des Projekts *Jüdische Zeitzeugen eines europäischen Jahrhunderts* im Jahr 2000 hat Centropa mehr als 1.250 Lebensgeschichten digitalisiert und dazu im Sinne einer Oral History zahlreiche Interviews geführt. Um etwa die ergreifende Geschichte der Holocaust-Überlebenden Tosia Silberring zu erzählen, werden ihre Erinnerungen an den jeweiligen Orten in Krakau mittels einer Web App zugänglich gemacht. Start des Rundgangs ist das Galicia Jewish Museum in Krakau. Interessierte werden ortsbezogen auf ihrem eigenen Smartphone informiert: Interviews, seltene Fotos und Schriftstücke stehen in vier Sprachen zur Verfügung. Die Nutzerinnen werden digital an der Hand genommen und sowohl innerhalb wie außerhalb des Museums zu relevanten Stationen der Erzählung geführt.

Als Orientierungshilfe zu den drei Touren dient eine 2D-Karte, die sämtliche historische Orte der jeweiligen Tour in der App anzeigt. Digitale Technik ermöglicht in diesem Fall die individuell-ortsbezogene Teilnahme an Zeitzeugenschaft, Oral History dient als Methode, Erinnerung lebendig zu halten.

© Centropa



# Following the Tracks of the Wildcat

## Nationalpark Thayatal

**CLIENT**
Nationalpark Thayatal

**LOCATION**
Thayatal, Austria


Together with the team of the Nationalpark Thayatal, we have developed playful and interactive media offers for both the visitor centre and its surroundings: For example, visitors can explore the special features of the national park using multimedia on a walk-through aerial photograph in the house.

As a special outdoor offer for children and young people, we have developed an interactive game together with the educational team of the national park: Small groups search for stations around the visitor centre identified by picture markers and can call up further content using tablets that have been issued: For example, how to recognize tree species by their leaves or how to search for wild cat tracks.

On their way through the site, the children also go on a photo safari and fill a virtual survival backpack with things from nature that seem important to them. They also solve twelve riddles, which are discussed at the end. Finally, each group receives a certificate as a gift: an educational and eventful offer for young (and old).

Gemeinsam mit dem Team des Nationalpark Thayatal haben wir sowohl für das Besucherzentrum wie auch dessen Umgebung spielerisch-interaktive Medienangebote erarbeitet: So können Besucherinnen die Besonderheiten des Nationalparks etwa auf einer begehbaren Luftbildaufnahme im Haus multimedial erkunden.

Als spezielles Outdoor-Angebot für Kinder und Jugendliche haben wir mit dem pädagogischen Team des Nationalparks ein interaktives Spiel entwickelt: Dabei suchen Kleingruppen durch Bildmarker gekennzeichnete Stationen rund um das Besucherzentrum und können mit Tablets weiterführende Inhalte abrufen: Etwa zur Erkennung von Baumarten anhand ihrer Blätter oder zur Suche nach Wildkatzenspuren.

Auf ihrem Weg durch das Gelände begeben sich die Kinder auch auf Fotosafari und befüllen dabei einen virtuellen Überlebens-Rucksack mit Dingen aus der Natur, die ihnen dafür wichtig erscheinen. Es gibt zwölf Rätsel zu lösen, die am Ende diskutiert werden. Abschließend erhält jeden Gruppe eine Urkunde als Geschenk: Ein lehr- und erlebnisreiches Angebot für Jung (und Alt).

# Dynamic and Fast

## Porsche Museum

**CLIENT**
Porsche

**LOCATION**
Stuttgart, Germany

© Porsche

A collection of more than 700 vehicles, including almost 200 from the world of motorsport – many of which, together with various small exhibits, constantly tell new facets of the history of the well-known sports car manufacturer: Among the automotive icons presented are, for example, the Porsche 356 "No. 1" Roadster, Porsche 911 of various generations, Porsche 550 and 917.

The regular special exhibitions are accompanied by a dynamic exchange of exhibits and thus of topics: at many of the stations, visitors are interactively involved in current topics. For example, that Porsche's history once began electrically: Ferdinand Porsche's first vehicle design was an electric car, a temporal and technological bridge from 1898 to the present day.

From 2020 to spring 2022, NOUS created audio and video contributions in German, English, French, Italian, Spanish, Russian, Japanese and Chinese – for adults and children respectively. In total, more than 2,400 audio contributions and video adaptations and more than 1,700 children's audio contributions were produced – a strong and impressive experience to strong and impressive cars.

Eine Sammlung von mehr als 700 Fahrzeugen, darunter knapp 200 aus dem Motorsport, erzählen gemeinsam mit diversen Kleinexponaten stets neue Facetten der Geschichte des bekannten Sportwagenherstellers: Unter den präsentierten Automobilikonen finden sich etwa der Porsche 356 „Nr. 1" Roadster, Porsche 911 verschiedener Generationen, Porsche 550 und 917.

Mit den regelmäßigen Sonderausstellungen geht ein dynamischer Austausch der Exponate und damit der Themenfelder einher: An vielen der Stationen werden die Besucherinnen interaktiv in aktuelle Themen einbezogen. Etwa, dass die Geschichte von Porsche einst elektrisch begonnen hatte: Die erste Fahrzeugkonstruktion von Ferdinand Porsche war ein Elektromobil, eine zeitliche und technologische Brücke von 1898 in die Jetztzeit.

Von 2020 bis Frühjahr 2022 gestaltete NOUS hierfür Audio- und Videobeiträge in Deutsch, Englisch, Französisch, Italienisch, Spanisch, Russisch, Japanisch und Chinesisch – jeweils für Erwachsene und Kinder. Insgesamt wurden mehr als 2.400 Erwachsenen-Hörbeiträge und Videobearbeitungen und mehr als 1.700 Kinder-Hörbeiträge produziert – ein starkes und eindrucksvolles Erlebnis zu starken und eindrucksvollen Autos.

© Porsche / Sabine Braun

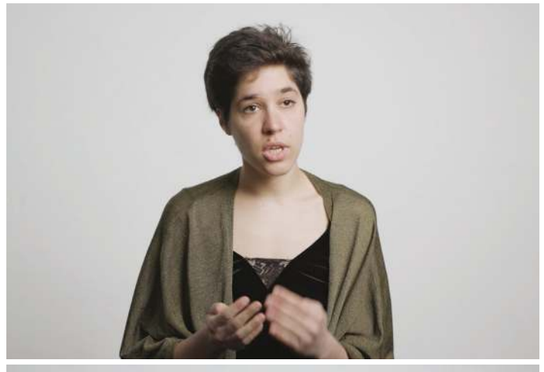


# In Search of Humanity

## Albertina Modern

**CLIENT**
ALBERTINA

**LOCATION**
Vienna, Austria



© Ai Weiwei / NOUS

© Ai Weiwei, photo: ALBERTINA / Lisa Rastl & Reiner Riedler

Ai Weiwei is probably the most famous Chinese artist of the present day. In 2022, the ALBERTINA MODERN showed key works by the activist and critic of authoritarian systems in a large-scale exhibition: Spanning more than four decades, the works move in the field of tension between pop and political art. In order to make his work accessible to a broad public, the Albertina's mediation department designed a video guide, which was implemented together with NOUS: In video interviews, the curator of the exhibition together with art mediators explain essential approaches to the artist's works, which could hardly be more topical in the worldwide political situations.

Ai Weiwei ist der wohl bekannteste chinesische Künstler der Gegenwart. Die ALBERTINA MODERN zeigte 2022 in einer groß angelegten Schau Schlüsselwerke des Aktivisten und Kritikers autoritärer Systeme: Aus mehr als vier Jahrzehnten bewegen sich die Arbeiten im Spannungsfeld zwischen Pop und politischer Kunst. Um sein Schaffen einer breiten Öffentlichkeit zugänglich zu machen, hat die Vermittlungsabteilung der Albertina einen Videoguide konzipiert, der gemeinsam mit NOUS umgesetzt wurde: In Videointerviews erläutert die Kuratorin der Ausstellung gemeinsam mit Kunstvermittlerinnen wesentliche Zugänge zu den Werken des Künstlers, die in den weltweiten politischen Situationen kaum aktueller sein könnten.

# Polyphonic Multiperspectives

## Foundation for the Humboldt Forum in the Berlin Palace

**CLIENT**
Stiftung Humboldt Forum im Berliner Schloss

**LOCATION**
Berlin, Germany

© Stiftung Humboldt Forum im Berliner Schloss, Andreas König

Rarely has a new museum building been as controversial as the Humboldt Forum in the center of Berlin, even before construction began. The reconstruction of the historic facade of the Berlin Palace, financed by private donations, behind which the cultural center was built in ten years, divided the opinions of citizens and experts from the very beginning. The content and presentation of the exhibitions – first and foremost the Ethnological Museum of the National Museums in Berlin – continue to be a source of debate. Sensitive and complex topics, therefore, which we had to take into account in the course of designing the 90 audio contributions for the media guide so far.

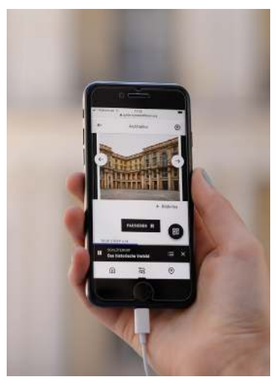
In direct reference to current debates on colonialism, we worked together with the curatorial teams to critically question and classify the provenance history of some of the objects, thus enabling as diverse a perspective as possible on the corresponding exhibits.

In addition to thematic competence, this extensive project required effective project management and cross-institutional and topic-sensitive communication.

Selten war ein Museumsneubau schon vor Baubeginn so umstritten wie der des Humboldt Forum in der Mitte Berlins: Die Wiedererrichtung der aus privaten Spenden finanzierten historischen Fassade des Berliner Schlosses, hinter der das Kulturzentrum in zehn Jahren Bauzeit entstand, spaltete von Anbeginn die Meinungen von Bürgern und Expertinnen. Auch die inhaltlichen Ausrichtungen und Präsentationen der Ausstellungen – allen voran des Ethnologischen Museums der Staatlichen Museen zu Berlin – sorgen nach wie vor für Diskussionsstoff. Sensible und komplexe Themen demnach, die wir im Zuge der Gestaltung der bislang 90 Audiobeiträge für den Medienguide zu berücksichtigen hatten.

Hierzu wurde in direktem Bezug zu aktuellen Kolonialismus-Debatten gemeinsam mit den Kuratorinnen-Teams ein kritisches Hinterfragen und Einordnen der Provenienzgeschichte einiger Objekte eingearbeitet und so eine möglichst diverse Sichtweise auf entsprechende Ausstellungsstücke ermöglicht.

Gefragt war in diesem umfangreichen Projekt neben inhaltlich-thematischer Kompetenz demnach die Fähigkeit zu effektivem Projektmanagement und institutionsübergreifender wie themensensibler Kommunikation.



© Stiftung Humboldt Forum im Berliner Schloss, David von Becker, Andreas König



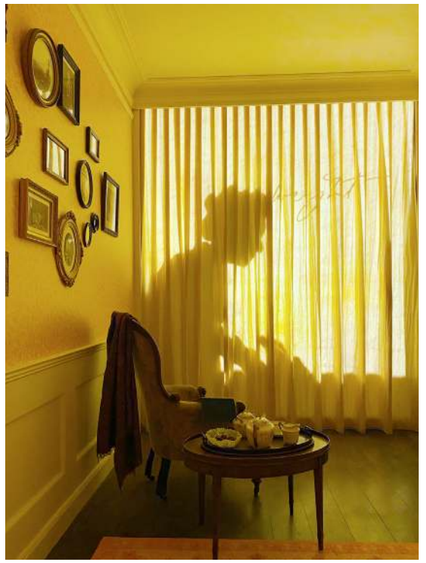
# Out of Africa – Establishing Universal Human Rights

## The Story of Emily

**CLIENT**
Emily Museum Ltd.

**LOCATION**
St. Ives, Cornwall, United Kingdom

**PARTNERS**
KossmannDeJong, Turbo.audio



The design of The Story of Emily in Cornwall is a successful example of the early integration of our product NOUS Sonic into an exhibition concept.

The 1,000 sqm museum, which opened in 2024, is centered on the birthplace of Emily Hobhouse and offers a journey through her life; from her pioneering work in the field of education to her central role in the establishment of women's rights and the creation of social justice in the context of the Boer Wars in South Africa. All of these issues can be investigated by visitors to the innovatively curated exhibition, in which personal items, letters, and photographs offer insights into Hobhouse's life and work: NOUS Sonic is an integral part of the storytelling concept and the individual user experience. For example, NOUS Sonic enables the audio story to be personalized by each visitor and synchronized with all other media – in terms of movement, position, and perspective. And the interaction of light, image, and sound creates an immersive overall experience that allows the visitor to play a participative role in the narrative: Forward-thinking meets cutting-edge technology.

Die Gestaltung von The Story of Emily in Cornwall ist ein erfolgreiches Beispiel für die frühe Integration unseres Produkts NOUS Sonic in ein Ausstellungskonzept. Das 2024 rund um das Geburtshaus von Hobhouse neu eröffnete 1.000 m² große Museum bietet eine Reise durch das Leben von Emily Hobhouse: von ihren Pionierarbeiten im Bildungsbereich bis zu ihrer zentralen Rolle bei der Etablierung von Frauenrechten und der Schaffung sozialer Gerechtigkeit in Zusammenhang mit den Burenkriegen in Südafrika. All dies können Besucherinnen in einer neuartig kuratierten Ausstellung erkunden, in der persönliche Artefakte, Briefe und Fotografien Einblick in Hobhouse' Wirken geben. NOUS Sonic ist hierzu ein integrativer Bestandteil des Storytelling-Konzepts und der individuellen User-Experience: So ist etwa die durch NOUS Sonic jeweils personalisiert erhörbare Geschichte – bewegungs-, orts- und blicksensitiv – mit allen weiteren Medien synchronisiert. Interaktionen von Licht, Bild und Ton ergeben ein immersives Ganzes und die Besucher werden partizipativer Teil der Erzählung: Zukunftsweisendes Denken trifft zukunftsweisende Technik.

# Working for NOUS

“I find fulfillment in engaging in creative activities, constantly facing new challenges, working on exciting international projects with diverse partners, being part of a pleasant and supportive work environment.”

Florian Irnberger
Project Manager

“What I enjoy most about my work is the diversity of our clients, technologies, and teams that always keeps things interesting.”

Benedikt Breinbauer
Teamlead Web Development

“NOUS is a pioneering firm specialising in cutting-edge technologies such as AI, Machine Learning, and Embedded Systems. I am thrilled by leading a talented and organized team that leverages AI to achieve daily goals and remain at the frontier of the AI community. Our team is ambitious and dedicated to excellence, constantly seeking innovative ways to make a positive impact.”

Osama Fawzi Taha
Head of iOS Engineering

“My job is incredibly diverse and varied, as I oversee various projects from start to finish. I learn something new every day – be it about medieval architecture, fashion history or almost forgotten French female artists!”

Verena Ruschemeier
Content Production Manager

“I really enjoy working at our company because of the many different areas of technology we work in and the opportunity to collaborate with people from all over the world. I appreciate that every day is different, and we strive to be at the forefront of innovation to provide our clients with the best products possible.”

Wolfgang Thaler
Teamlead Museum

“My days are a whirlwind of exciting and challenging activities that require creativity, collaboration, and problem-solving skills. My focus is on conceptual and requirement-specific engineering activities, which involves understanding our clients’ goals, researching user needs, and translating those into functional essentials. This needs working closely with stakeholders, product owners, and developers to ensure that our products are user-centered and meet our clients’ needs.”

August Kampfer
UI/UX Designer, Team Lead and Scrum Master

“I feel privileged to be able to create beautiful and engaging content-centric experiences for museums and cultural institutions. It brings me great joy to be part of a team that is dedicated to sharing the love and appreciation for history and art with the world.”

Sophie Zeissler
Backend Developer, NOUS CMS

# Glossary

→ ACCESSIBILITY The design of products, devices, services so as to be usable by people with disabilities. With profound expertise in the fields of DIGITAL HUMANISM, NOUS is developing fully accessible media guides e.g. for **Jewish Museum Berlin**, **Louvre Abu Dhabi** or multisensory experiences within **BeauCoup**.

→ ARTIFICIAL INTELLIGENCE (AI) A marketing term from the 1960s that covers all kinds and levels of machine learning. Fields of application include text or image generation, advanced data analysis or language recognition and transcription. We are using AI at **Louvre Abu Dhabi** for automated image recognition.

→ AUGMENTED REALITY (AR) An interactive experience that overlays real and computer-generated content on visual and/or auditory levels. AR enrichment is often perceived via apps, special glasses or headsets such as NOUS Sonic. We have implemented AR at the **European Central Bank** and provide augmented listening experiences through our NOUS Sonic ecosystem.

→ BRING YOUR OWN DEVICE (BYOD) In our context a set of policies that regulates if and how visitors are using their own devices (mostly smartphones) to experience our media guides – as opposed to take devices handed out by the museum. Especially with the increasing possibilities of PWA, this offers visitors very easy access to the contents of the respective museum: both during their visit and afterwards.

→ CITIZEN SCIENCE Research conducted with participation of public volunteers who assist in the collection and classification of data and enhance the capacity of the scientific community or museum. NOUS helped to establish this new and future-oriented approach at **House of History Baden-Württemberg**.

→ CO-CREATION A process of collaboration between our company, customers and partners in order to jointly develop the most innovative and customer-centric products or services possible – for example using DESIGN THINKING. In two steps of submitting ideas and selecting the most promising ideas, this non-hierarchical collaboration creates synergies from the provider and customer domains.

→ CONTENT MANAGEMENT SYSTEM (CMS) Computer software used to manage the creation and modification of digital content directly by the costumer. Our own CMS NOUS Conductor has been and is used by more than 100 clients all over the world: It reflects and therefore supports the workflows within cultural institutions.

→ DESIGN THINKING A six-stage iterative process for analyzing and solving complex questions and problems, particularly from the user's perspective, with the aim of finding the most customer-oriented solution possible. This is achieved through constant feedback between the development teams and the processes and behaviour of the respective target group. Ideas and solutions are communicated and tested as early as possible in the form of prototypes.

→ DIGITAL HUMANISM A mindset, a philosophy, a political topic, a scientific approach, and – most of all – an urgent need in society, especially since the omnipresent advent of AI. Manifested in 2019 in Vienna, it is determined to build, regulate and develop technology for people in order to balance the relationship between society and technology.

→ IMMERSION Refers to the involvement of as many human senses as possible to achieve a holistic sensory experience. With NOUS Sonic, we build audio-immersive environments in artistc and cultural contexts like at the **Hans Christian Andersen Museum**, **Wiener Konzerthaus**, **Wettingen Abbey**, **Harvestworks New York** or **The Story of Emily**.

→ INCLUSION Superordinate to the more technical term ACCESSIBILITY, it generally means the creation of a culture or environment in which all perspectives are heard, seen and valued. In the context of software development, this socio-political term increasingly refers to the needs and organisations of people with disabilities.

→ INDOOR POSITIONING SYSTEM (IPS) A network of devices used to locate people or objects where GPS and other satellite technologies lack precision, such as inside multistorey buildings like museums. NOUS offers precise IPS based on Bluetooth BLE, Wifi, RFID or ULTRA-WIDEBAND e.g. for **State Museum of Egyptian Art** in Munich, **Jewish Museum Berlin**, or **Hans Christian Andersen Museum** in Odense.

→ INTERACTION DESIGN (IXD) The practice of designing interactive digital products, environments, systems, and services – in our case primarily in the field of human computer interaction for **hollu Systemhygiene**, **State Museum of Egyptian Art** in Munich, **Jewish Museum Berlin** or **House of European History** in Brussels.

→ MULTIMEDIA GUIDE A device, mostly mobile, specifically designed to provide rich audio, visual or textual content to museum visitors with or without user interaction. NOUS was one of the first companies worldwide to have a multimedia guide implemented and now offers manifold solutions for the **House of European History**, **Humboldt Forum** in Berlin, **Albertina Modern** or **Mythos Mozart** in Vienna.

→ NATIVE APP A digital code for use on a very specific platform or mobile device (e.g. Android or iOS). The benefits include access to specific device features as push notifications, offline data, automatically system updates or library usage. We planned, designed and developed native apps for **ORF**, **ÖBB**, **hollu Systemhygiene**, **Louvre Abu Dhabi** or the **European Central Bank**.

→ NOUS [NÜ:S] A term of ancient Greek philosophy, usually rendered as spirit, mind, or reason. Sometimes equated to intellect for the faculty of the human mind, which is described as necessary for understanding what is true or real, similar in meaning to intuition. It is also understood as a form of perception, which works within the mind: Enough reasons to be the name of our company.

→ PROGRESSIVE WEB APP (PWA) A type of application software delivered through the web. PWAs are built on common web technologies including HTML, CSS or JavaScript and commonly used on mobile devices. NOUS implemented this new technology at **document Kepler**, **Albertina Modern**, **Centropa** or **hiStory** and **BeauCoup**.

→ SERVICE DELIVERY MODEL (SDM) A framework of processes involved in providing a service throughout the business relationship between the company and the customer. We deliver various elaborated SDMs for our clients and design future-oriented SDMs within **hiStory**, **BeauCoup** or **24h-Care**.

→ SMARTGLASSES In our context eye or head-worn computers, including displays that add information alongside or on top of what the wearer sees (in the meaning of AR). We use smartglasses as part of our project in Hegra, where they offer visitors an additional level of information and personalized experience.

→ ULTRA-WIDEBAND (UWB) A radio technology that uses a very low energy level for short-range, high-bandwidth communications and is mainly used for precise indoor localisation. We are using UWB within the IPS for our NOUS Sonic System at **Hans Christian Andersen Museum**, **Wettingen Abbey**, the **National Library of Wales**, **Austrian Cultural Forum New York** or **The Story of Emily**.

→ USER EXPERIENCE (UX) How users interact with and how they experience our products and services. This includes perceptions of utility, use friendliness, efficiency or accessibility. In order to ensure a positive customer experience, a holistic view of the user and the product is taken. By analyzing, creating and optimizing the UX, all phases of a product or service are thought through – from the initial ideas to use, service or maintenance.

→ USER-GENERATED CONTENT Any form of content such as images, videos, audio, text or testimonials that has been posted by users on online platforms. We developed feedback channels for **hiStory** (Storytelling), **House of History Baden-Württemberg** (Citizen Science) or **Nationalpark Thayatal** (Kids Adventure).

→ USER INTERFACE (UI) The place or action where someone interacts with a machine or device. In order for a UI to be usable and meaningful for people, it must be adapted to their needs and abilities. In our case, the basic knowledge for user-friendly interface design is developed in the field of usability engineering: These interfaces include all components of an interactive system that provides information and controls necessary to complete a specific work task using the soft- or hardware.

# Our Clients

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