

# Virtual Reality Archive Learning

## Handbook

Today the terms “digital” and “virtual” are synonymous for progress, simplified access to information, democratization of knowledge and an almost youthful attractiveness. Placement projects using virtual technologies in a digital space overcome geographic barriers and pave the way to information, that otherwise would be highly guarded and difficult to access treasures in archive vaults and museum reserves. The same techniques allow people that do not possess any highly specialised qualification access to historical information. Ideal for an Erasmus+ project of adult education.

The European project VIRAL – “Virtual Archive Learning” goes a step further. By using free software and low cost devices, virtual technology becomes affordable for the many small and medium sized archives, libraries and museums. Didactic tools, good practice examples and training courses allow experts and adult trainers to use these technologies effectively. Therefore existing human knowledge can be used, chances increased and new skills acquired.

By focussing on industrial heritage, broad sections of society are included. Personal experience, stories of family members and neighbours or the presence of gone by or still existing industrial areas in the immediate personal habitat should fascinate and encourage participation of people that are otherwise hard to reach by traditional educational work.

This project was developed together by seven partners from six nations, including: Coventry University (United Kingdom), City Archive Wuppertal (Germany), Museum of Slavonia (Croatia), Museum Fábrica Grande (Portugal), E-Learning Studios (United Kingdom), Elderberry AB (Sweden) und the City Archive Dornbirn (Austria).

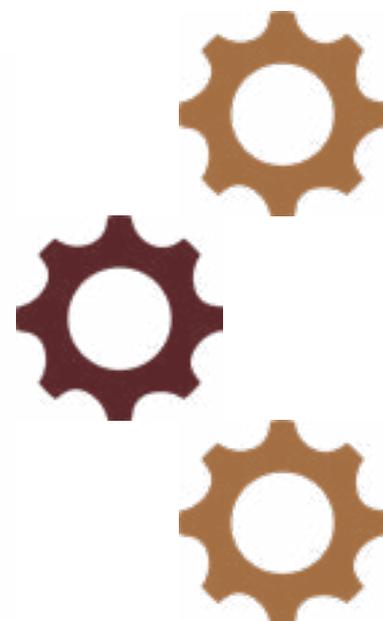
All partners, through their historic knowledge, their pedagogical expertise and technological competences as well as their commitment, contributed to the success of this project.

Werner Matt  
Project Coordinator  
City Archive, Dornbirn, Austria



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This guide is designed to give you an overall view of how to use and implement the VIRAL Handbook into professional practice and adult education. The context of VIRAL project will be exploring and documenting the industrial heritage of their local communities.

VIRAL aims to offer skilling and/or upskilling paths for adults in new key competences and at the same time equip adult educators and cultural heritage professionals to collect and archive heritage material.

The resources in this handbook can be used to support theory into practice and give inspiration through the following areas:

## Educational Essays

Will give ideas for theory into practice, including the current state of immersive teaching in contemporary museums. Interactive references will provide you with the opportunity to view more information at your leisure.

## Case Studies

Give a “real life” examples and accounts of what contributing partners have achieved in their own countries which will give you inspiration for your own creative practice.

## Key Terms of Reference

Outlining specific key words that have been used throughout the interactive handbook with an extended and tailored definition to support.

# Using Virtual Reality for Archive Learning

Within the ViRAL training a virtual reality scenario will be created that will follow a digital trail through Dornbirns industrial past. Virtual Reality (VR) is an artificial environment created by a computer, that can simulate a real or imagined environment, including vision and sound, which is usually experienced through a headset or special glasses. With this surrounding imagery and sound many people feel immersed, as if they are actually present in this digital world.



Story telling by the ghost with images

In this case a journey through the city will show certain elements of the history of Dornbirn led by three different narrators. A worker, an engineer or the owner will accompany you digitally through the industrial site. As you virtually travel through the factory your chosen narrator will tell the story from their point of view, other digital artefacts will be used to illustrate the history, for

example; when an engineer tells his story a gallery of images appear that show the products made in the factory that existed in that part of the city. At the workshop the worker will talk about working and living conditions at that time.

There is a growing body of evidence that VR and virtual environments can have a “positive impact on learners performance” (Merchant et al. 2014) The Dornbirn VR can be used as a learning tool within the training to demonstrate how visual aids such as documents, photographs, maps and video can be used to curate a story – to bring together the elements in such a way that it brings the story to life to create interest for the viewer/audience and to make the archive learning a richer more meaningful experience.

*The Viral methodology addresses the use of VR productions of post-industrial sites for developing the key competences of low-skilled adults.*

Merchant, Z., Goetz, E.T., Cifuentes, L., Keeney-Kennicutt, W., and Davis, T.J. (2014) ‘Effectiveness of Virtual Reality-Based Instruction on Students’ Learning Outcomes in K-12 and Higher Education: A Meta-Analysis’. *Computers & Education* 70, 29–40

# The Target Groups

In a former industrial city affected by structural change, there is a great need to catch up on continuing education. The post-industrial landscapes have left a rich cultural heritage. The material and immaterial culture of the industrial heritage can be used as an educational resource for adults. This can best be done by raising the knowledge and treasures of the industrial culture - factory halls, machines, the stories of the workers who served them, etc. - and the associated archive materials, the collection, preservation and editing of archival documents and the abilities of the Teachers and trainers.

In this way, different goals can be achieved:

## Adapting the story to the present:

The recipient becomes aware of how people have been shaped by their environment and, conversely, how they have shaped that environment. Change possibilities are recognized, willingness to change can be developed.

## Reduce feelings of Anonymity:

The lack of localization and rooting of the inhabitants in modern cities can be reduced in favor of the consciousness to stand in a tradition. Dealing with this tradition can reduce feelings of lostness in metropolitan anonymity.

## The Cultural Worker:

The traditional, often reduced to the "fine" arts concept of culture is automatically expanded by the study of industrial culture. For many people, for the first time, there is the awareness that they are also a "cultural bearer" and even a "cultural worker".

## New Technology:

Presenting historical locations and materials using state-of-the-art technology creates, stimulating imagination with completely new perspectives on history and, on the other hand, an appreciation of new technologies that might have seemed rather alien and thus frightening.



It is important to directly address potential target groups that can benefit from the work culture heritage material for their vocational education. But for that it is important to define these target groups. These include:



There are a number of institutions of vocational education and training, on these target groups can be addressed directly. Also institutions that take care of socially disadvantaged people as well as the university, museums or media centers should be involved. Networking the facilities with the project is helpful in expanding the circle of target groups.

A target group can develop new skills and competencies from the educational resource, post-industrial heritage, by making sustainable use of a tailored learning program. Issues that are more likely to occur in a target audience need to be recognized and turned off, goals set for a particular group. An approach or way to efficient learning through the activation of vocational training methods in the field of industrial culture has to be found.

Cultural heritage makes a considerable contribution to education, the economy and society. Therefore, it is important not to focus education and training programs based on post-industrial heritage not only on people with a traditionally higher educational level, but also to use them specifically for the specific needs of the identified target groups. It makes sense to combine specially designed programs based on industrial culture with different disciplines such as education, business, technology, etc., and as an opportunity for innovation to understand and use better career and educational opportunities and social skills.

# Bringing the past into the future: A Model for Immersive Heritage Archives

Jacqueline Cawston, Postdigital Cultures Research Centre  
Coventry University, UK

There are many examples of excellent digital heritage using new technologies such as virtual and augmented reality: The British Museum, MoMA in New York, The National Museum of Natural History in Paris, and the National Museum of Finland to name a few. But how do smaller cultural heritage organisations without the resources and deep pockets of such large museums go about making an immersive digital heritage space?

This essay explains a model, developed over 6 years of designing digital heritage projects that can be used as a template for cultural organisations to develop their own digital heritage exhibitions.

The model itself was influenced by several Constructivist (Piaget 1976, Fosnot 2013,) and Connectivist (Siemens 2005) theorists who focus on building knowledge through objects that are tangible and shareable, creating meaning from experiences, and connecting through communities. Way back in the last century educational psychologist Lev Vygotsky<sup><1></sup> believed that access to culture was a large factor in cognitive development and that social elements were crucial to the learning process.

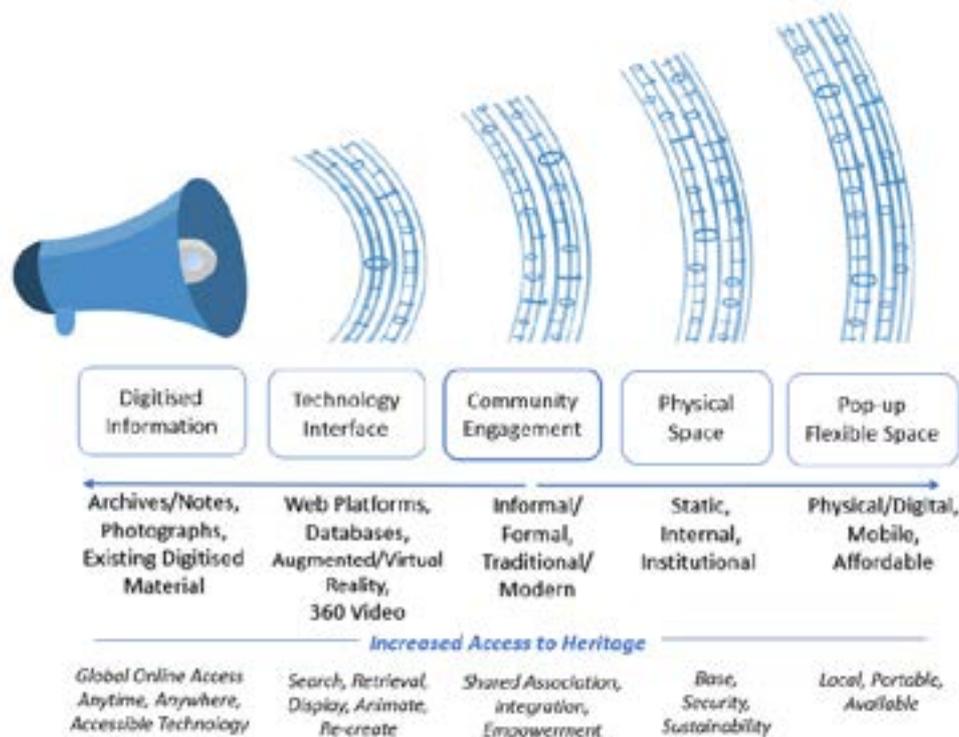
Vygotsky focused on the connections between people and the sociocultural context in which they act and interact in shared experiences (Vygotsky 1997). He referred specifically to knowledge and learning being transferred by the 'More Knowledgeable Other' (MKO). The MKO being someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process or concept. This would normally be thought of as a teacher, but in this case, the MKO could be the digital platforms conveying the information, alongside peer-to-peer knowledge transfer.

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<sup><1></sup>Lev Vygotsky 1896 – 1934 born in Russia, was an educational psychologist who developed a Social Development Theory based on cognitive development.



# Educational Essays



As you can see the model has five interlinked phases, of most importance is the community engagement running throughout. First you have to digitise your information (text, reports, images) and when the material is digitised we come to the “so what!” part of the procedure, in my view there is no point in creating a beautiful archive if no one looks at it. The digital interface here can be a simple database and retrieval system, but I have found that innovative technology can make the difference between a glance and real engagement with the archive. <2>

Some of the applications I have used in the past have utilised technology such as geolocated markers to pull archival heritage to your phone at the appropriate physical location. I have also used digital picture mosaics, which enable the user to zoom into a pattern of random documents unearthing a surprising cache of content from the archive, providing serendipitous and delightful finds of unseen heritage documents.

What I am advocating in the second phase of the model is the use of exciting new immersive technology to bring the past into the future. Immersive, in this context means being deeply absorbed, so that the user feels completely involved. Immersive technology includes; virtual reality (VR), augmented reality (AR) and 360 videos (360). Augmented reality is defined as the layering of digital images over the real world through a tablet or mobile phone, a good example from the Lanchester Interactive Archive, is when a visual trigger is actioned on a digital device, then Frederick Lanchester’s sketch of a glider

<2> Engagement here refers to the user attraction to the medium and absorption in the content.

comes to life and flies around the room within the setting of the tablet or smart phone.

Although immersive technology is relatively new, there is a body of evidence to support the efficacy of digital games, augmented reality and virtual reality as a learning opportunity, and as fun, motivating and engaging (Chen and Wang 2017). Don't think that VR is only for young people, when we showed our community group of mature adults several different digital technologies, virtual reality came out on top.

In phase three the community is central to the model and should be involved in every stage. However, the collections are often digitised first, and when made available, they appeal to different interested groups or communities who may wish to reorder the archive content according to their needs and resources. Community involvement in the spirit of participatory design (Simon 2010) should be a central focus, where instead of guiding the participant-designers on a set journey, the exhibitions can be re-designed by the community allowing for bespoke multiple versions of beginnings, middles and endings.

Which brings us to the importance of space or place in stage four and five. The physical home of the collection often has a special place in the heart of the local community, endeared to the regular visitors, but how do we reach those people that don't generally visit museums and heritage sites? Digital technology has many advantages when developing outreach community heritage spaces, it is true that visitors want to get closer and to touch objects, but this can be difficult with a collection of mainly paper-based archive items such as reports, notes and drawings, as in the Lanchester Interactive Archive.

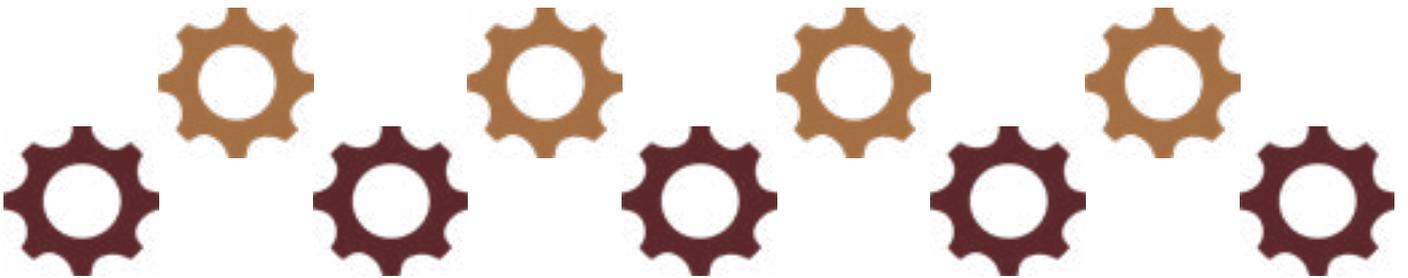
Facsimiles such as blueprints placed in drawers can give the visitor some idea of the collection, but here the immersive technology of augmented reality and digital games come in to play as the tactile elements of handling objects are replaced with mobile phones and tablets. The content comes to life through portable and reconfigurable technology. I believe that the most beneficial characteristic of a pop-up space is that it brings heritage to the community, often far from the institution, allowing those who would not otherwise have the means or resources to engage with it.

The pop-up outreach phase became increasingly important to the model when, in the Mandela27 project we used a flexible, DIY version of Nelson Mandela's cell in Robben Island Museum as the hook on which to hang the digital assets

of: a serious game; a photographic slideshow and 360 videos. This installation was reconfigured by the communities in different versions of wood, metal, cardboard and even in marked out sections on the floor, bringing the museum out of the institution, most notably to the community townships in South Africa.

Curators and educators are exploring the opportunities available to them through this digital immersive technology, where we can be transported through headsets or mobile tablets and phones to a multisensory world. Currently, VR applications are developed by the experts creating semi-realistic immersive worlds, but that is changing. With the development of new cameras, equipment and software VR will soon be affordable and user-friendly, even for those with limited technical abilities. AR and 360 on the other hand, are both available and affordable now.

In the ViRAL project we will explore low-cost, transferable, effective methods of creating similar feelings of immersion to bring heritage collections to life. I look forward to the different and varied versions of digital heritage that will be created by the diverse communities in the project and in the future.




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"Flexible, pop-up installations are a good way  
of taking heritage out of the institution to the  
community."

- Jacqueline Cawston

# Attracting Young Adults to Archives and Museums

David Powell, Managing Director, Elderberry, Sweden

The role of many archives and museums in society is changing. They are becoming socially responsive cultural institutions open to scrutiny, visitor-centred and interested in how to connect with the public and broaden their scope to new audiences. Archives and museums are thriving in the age of virtual reality, as trusted providers of high-quality information in response to misinformation and fake news. Here is a paradox. The group least likely to visit an archive or museum, but perhaps most in need of their services, are young adults (ICOM) between the ages of 18 and 24. The same group are most likely to use new technologies such as VR, AR and 360 video. How can we encourage young adults to appreciate and use both forms of media.

The internet, AR, VR and other digital media will not replace in-person visits to archives and museums. Most studies have shown that digital media and visits compliment each other and do not compete. Many institutions have asked "If visitors can access our collections through digital media – will they still come in person?" Technology such as VR will not replace a personal visit to enjoy or research an artefact. New technologies can enhance such a visit and give it context. As virtual experiences become more common, authenticity and being able to get near to real artefacts will become more highly prized. Research has shown that if visitors are able to experience an artefact digitally beforehand, they are more likely to visit. Let's be clear – nothing replaces the direct experience of visiting and getting close to an historical artefact.

Digital productions in gaming and other media have set a high standard of experience for young adults. Simulations – immersive game-like environments, interactions with digital "people" are now experienced in personal, professional and public domains by many young adults. At the same time virtual/augmented recreation of historical/cultural events and environments is becoming more accessible to even the poorest archive or museum. The mindset of future visitors will be shaped by their own exposure to such digital technologies. Today's archives and museums for example, contain exhibitions heavily reliant on texts placed in a chronological order. Research tells us that only 10% of such texts are ever read. The young adult will have more experience of visual information and the desire to create and guide their own experience.

Archives and museums may have had difficulty competing with this level of expertise and experience and will need to engage with young adults in order to plan for the future.

Technical decisions made today will need to include partnerships with young adults and young businesses. Archives and museums will need to learn from earlier "digital mistakes" for example avoiding customisation of digital products such as databases. Key words are: standardisation, interoperation and partnership. Digital technology requires the best human assets. Experience has shown us that digital technology will only increase in complexity, whilst at the same time becoming cheaper and more accessible. There is no longer room for employees or volunteers who refuse to collaborate with technological developments.

It is in the interests of archives and museums to successfully engage a young adult audience. Internationally many institutions have tried to reach this target audience. In order to successfully attract young adults, institutions must address their needs and requirements and at the same time look at the barriers preventing young adults visiting and using their institutions. Key barriers can be identified and these include the stereotypical view young adults may have of such institutions as being irrelevant to their interests, identity, needs and desires. The financial cost of a visit has to also be considered. With the introduction of social media, the internet, and digital gaming, the way that young adults process information has changed. They require choice and the option of customising their own experience. The digital environment invites people to be social and to learn/ share ideas as a group of like-minded people.

They can ask questions, test their skills, share, compare, collaborate and co-create not just simply read and review. They want to explore contemporary issues and the future, whilst activities in archives and museums are by nature fixed in the past.

This level of interaction is not always found in archives and museums. Most interactive activities at archives and museums are aimed at children, and therefore do not suit this age group. Memories of enforced school visits to archives and museums, having to fill out boring worksheets and being unable to pursue their own interest will significantly influence the choice of visiting archives later on in life. Young adults associate archives and museums with formal education, not informal learning or enjoyment. Archives and museums must find a way to make themselves appear much less as a formal educational institution, and more as a casual, informal place of social learning. Engaging with digital media to attract young adults may be a step in the right direction.



How can we attract young adult visitors by engaging in digital media?

Pop-up, mobile archives and museums and outdoor exhibitions in unexpected places are a possibility. The Centre Pompidou has a pop-up where items from the collection are presented in tents in a Paris suburb, with the setup reminiscent of a circus - light, flexible, cheap and festive.

The archives and museum of London have recruited young people aged 16-21 to form "The Junction Youth Panel", who act as consultants and work with the archives and museum to ensure projects, displays and events appeal to young people. These concepts have been "marketed" by various forms of social media such as Facebook and Twitter which facilitates connection online.

This mobile format shows the archives and museum in a new and exciting way. The idea is an underground, young, edgy and special event.

#### Motivations for visiting archives and museums for young adults:

- Experience something interesting and different
- A specific focus of interest, seminar or local artist
- Availability to open in the evenings
- Recognised as a regular social destination
- Increase interactive activities
- Advertisement through social media
- Use popular culture - live art creation, musical performances, live performance art
- Reenactments of historical events
- A range of spaces offering different experiences such as interactive activities
- The option of being able to sit back, observe and reflect
- The opportunity to interact in and take part in exhibitions
- Enjoy lectures given by professionals in a specified field

Research has shown that young adults do find the content of archives and museums interesting. However the main problems are firstly getting them into the archives and museum as well as making it an environment relevant to their social needs. Once archives and museums accept and adapt to the social needs of young adults, they may be seen in a different light; no longer as old, boring, dusty institutions, but instead fascinating destinations that are widely accepted social destinations.



<4> Supporting interactive links: [Mandela 27](#) / [Grandmas Story](#)

<5> Anderson, D., Horlock, N., Jackson, T., Testing the Water: Young people and galleries, Liverpool University Press, Liverpool, 2000. Bartlett, A. & Kelly, L. Youth audiences: Research summary, Australian Archives and museum.

# Out of and into Archives: Museums using virtual technology

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Archives contain written texts. Those mostly handwritten texts consist of files, letters, decrees, documents, drawings etc. All of them tell us of processes that are important for the functioning of a municipality, a company, or an association. A Museum contains objects collected to preserve memories of places, events, or activities. Let's take a loom shown in a museum, for example. We can find out by whom, when, and why it was designed and what it cost in an archive. We will also find which companies bought this model and what they produced with it. We can find out about the living and working conditions of the workforce as well as the owners. Broadly speaking, you can find the interesting stories in an archive, the nice objects in the museum.

Archives provide an abundance of documents. Historians and archivists create different stories with this huge amount of information. These tales reach the audience via books, exhibitions and speeches.

Good lecturers are needed to tell a tale in such a way to reach the widest possible audience. Usually archives address a specialised, well-educated audience, which is also true for museums and libraries. VIRAL aims to create artificial objects of attention, using technologies like virtual reality, augmented reality, and 360-degree videos. Such digital anchorage points, which can be visited anytime and from anywhere, create lots of new education prospects, especially for small archives.

Those population groups that would never think of a visit to an archive or can hardly imagine following a linear told story for a whole event can be excited for a virtual visit.

Museums face a completely different situation. If the museum is part of a historic ensemble, the historic often must make way for a contemporary presentation. An old assembly hall is not used to build machines anymore, but to present specific objects and information to visitors. A workplace becomes a cultural space. Similar things as mentioned above apply. With the tools of the VIRAL-project, artificial environments can be created allowing smaller institutions to invite interested people into their virtual rooms. Of course, this also applies to a museum's collection. Virtual technologies allow opening up

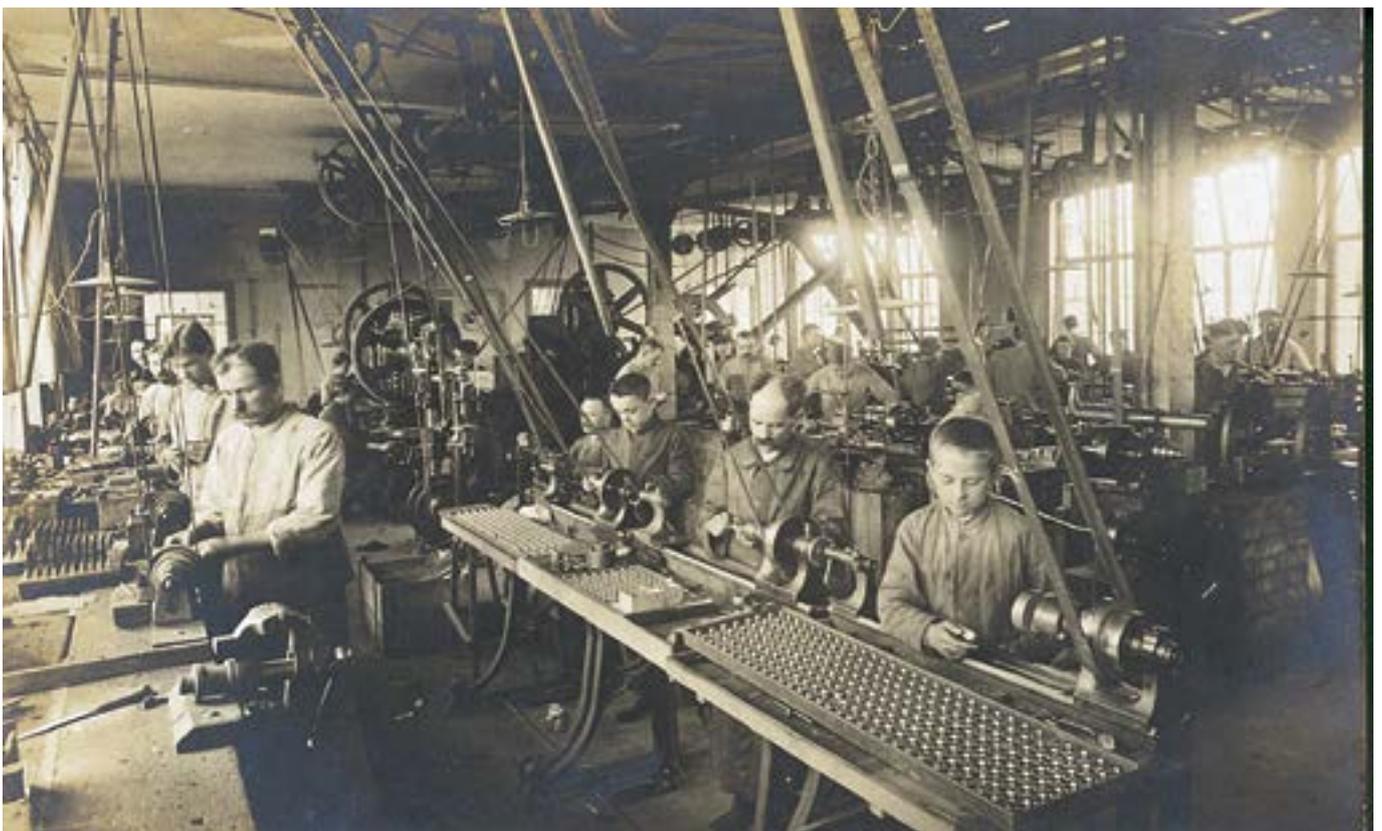


depots to the public, without the need of creating viewing depots through expensive modifications.

Our virtual loom - to remain with our initial example – or virtual premises, or even the full experience of a weaving mill allow for many different stories to be told without any effort. Well made productions provide the user with choices. If I am interested in the owners life, the genius of the engineer, the working conditions at the loom, I can visit that specific virtual room. While in a lecture, I have to listen to all of it. In the digital world, I can choose a desired topic then come back later and listen to something else. Maybe I, as a visitor, can create my own virtual exhibition out of documents and collection items, and add my own texts. It is a completely different visit to a Museum or an Archive; it is a completely different opportunity of learning.

To give small and medium institutions these options, not only cheap and easy to use software is necessary. It also requires well-chosen examples and training courses to create an engaging narrative structure, as well as find the right topic, length, and design for the desired target audience.

That's why industrial heritage was chosen as a thematic field. Here, the largest amount of people were involved, but their work is vanishing or changing with every technological innovation. While castles and chateaus, town houses, and villas are the pride of every city, industrial sites are continuously adapted, changed, or removed. Industrial heritage affected many people, but is slowly fading away – the project wants to give something back to them.





At the same time, it appeals to people that are difficult to reach through classical educational programs by archives and museums.

However, this article is not only about the 'out of', it is also about the 'into'. Digital formats allow the user to play an active role. Their own working, family, and consumer experiences allow many to participate in such projects or learn to take part in such a process. Ex-workers ask different questions and tell different stories than the unemployed. Juveniles see things from their own perspective. Questions of migration, gender, and class are, of course, paramount issues in industrial labour. All them can be prepared via prepared tasks (Quests) or selected examples for a variety of groups. With this prepared and active participation, new skills and competences can be acquired.

Archives and Museums have to ensure that those stories, reports, research activities and explanations find their way back into their collections. This is a congenial supplement to the archive documents created by the forces of production and profit, and the collections of museums created by aristocrats and the bourgeoisie. It is an important, democratic opening of what seems to be an otherwise impregnable fortress inside formal and official institutions for a large amount of the population. Learning comes through the breaking of barriers of reading oriented archives and classic museums, through active and interpretative participation and through exchange of information. A long-held dream comes true, archives, museums and libraries open up, the teacher learns from the student.

# CASE STUDIES



Nestled in the heart of Coventry University's Library is a micro museum that tells the story of the life and works of Frederick Lanchester, born in 1868, who was an engineering genius and polymath. Most notably Lanchester invented the first all British petrol car in 1895, he filed over 200 patents for his designs and inventions, most of which are still in use today.

Lanchester's archive was gifted to Coventry University, and in 2016 with a grant from the Heritage Lottery Fund and Coventry University the work began to make it available to the public. The notes, documents and blueprints were digitised and homed in a unique public space within the Lanchester Library. Also in the space, to the delight of young and old, is the half of a real 1930's Lanchester Car with working lights, indicators, steering and even a horn!

It was recognised early on that many people could be deterred from visiting such a space in the university building, and that an outreach programme to take the museum out of the institution would be very important. Another issue was the lack of tactile assets, therefore we had to capitalise on any visual elements of the archive through new technology such as augmented and virtual reality. As such, a suite of portable digital assets including four digital games and twelve augmented reality (AR) experiences were developed to tell the stories within the documents and blueprints, crucially, these digital experiences can be taken out of the space and shared more widely using a pop-up exhibition.



Outreach staff discovered several links between the local community and the Lanchester name, often shared by Coventry residents; collecting & collating these memories to make them more easily accessible helps to make the Lanchester story more current and personal.



## The importance of AR and interactive elements

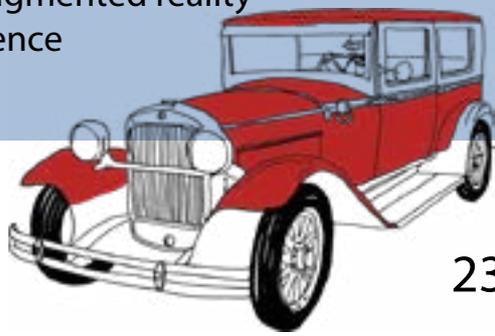
An important objective of the Lanchester Interactive Archive project was to convey the innovative and visionary quality of Frederick Lanchester’s work to audiences that generally do not visit museums.

The games in the archive are not only beautiful animations, they also explain the physics behind Lanchester’s inventions, allowing the user to experiment with various aspects of automotive and aeronautic engineering in a fun and engaging manner. For example: in addition to reading about the principles of automotive engineering described in Frederick Lanchester’s work, users can participate and see for themselves, by digitally placing the correct gears or brakes in digital game to make the animated car move.

### Top Tips:

1. Outreach workers in the Lanchester Interactive Archive have developed close links with teachers so they can ensure that the outreach visits coincide with formal teaching of the UK national curriculum
2. The Lanchester Interactive Archive provides an invaluable resource for students interested in: heritage; archives; science; technology; engineering; outreach; history; marketing and many other fields. Make sure that local higher education institutions are aware of your hidden treasures
3. When using pop-up outreach, photocopied prints of the augmented reality photographs are a cheap and easy option to engage the audience

For more information and to discover the space online, visit the Lanchester Archive website [Click Here.](#)



# Croatian Greats

Croatian Greats application uses AR and 3D animation to revive Croatian banknotes in a fun and educational way.

The use of digital innovations such as digitalization of archive collections, AR, VR or 360 ° camera shooting in museums becomes part of modern approach to the promotion of museum materials and the education of an increasing number of digital literate visitors. The goal of digitization is to bring museum holdings and objects closer to the end user. Users can be either students or researchers who explore the specifics of historical or stylistic periods. The digitized material of a local yet national museum becomes globally recognizable but easily searchable. Digitization is one of the positive processes of globalization that contribute to humanity because digitization reduces the distance between research sources and users.

The Museum of Slavonia situated in City od Osijek has about 300 000 museum holdings stored in 116 different museum collections. The presentation of the entire number of holdings is almost impossible. Some of the reasons are lack of space and financial resources. Nevertheless, the Museum's staff started the digitization of the 18th-20th century German press releases in Croatia, which are stored in the Library Department. Between 1786 and 1945, more than 100 German-language press releases were published in Croatia, most of them in Zagreb and Osijek. These publications are an important source of language, literature and culture of German-speaking people. On the <https://essekiana.eindigo.net/> portal there are now available digitized copies of the Osijek





The application is free and easy to use.

[Click here](#) to view and download!

newspapers Die Drau, Slavonische Presse and the Essegger Bote calendar. The Portal is the source of archive documents, and it also enables research into the literature, language and culture of the German minority in Croatia.

In the future, the realization of the permanent exhibition of the Museum of Slavonia holdings is planned. The desire of employees is to offer their visitors a personalized experience. The approach is to apply a variety of digital innovations such as virtual tour of the museum, use of QR codes, mobile applications based on geolocation, augmented or virtual reality. These digital innovations will enable the creation of a universal user experience.

From year to year digital innovations become easier to use and the cost of services is more affordable for customers. Examples of AR applications are diverse. Thanks to the enthusiasm of the Croatian company Delta Reality, the banknotes of the Republic of Croatia have revived. Each Croatian resident in his pocket has a banknote that can be revived by the application of an extended reality. Each banknote has its basic color. On the face of the banknote there is a figure of a Croatian Great regarding history or culture. The back of all banknotes shows a panorama or characteristic motif of a Croatian city.

The aim of the application is to bring Croatian historical figures and facts from banknotes closer to every resident or tourist. By scanning the AR trigger amazing 3D animations such as the statues of the Croatian greats, gladiators fighting in the Pula Arena, the coronation of the king and many others.

With this application, users can learn more about motives with Croatian banknotes, play games, and share incredible photos of revived characters with friends.



# Virtual Reality in Friedrich Engels 2020 exhibition Wuppertal, Germany

A visit to the company Engels in the “Unterbarmer Bruch” in the time of early industrialization.

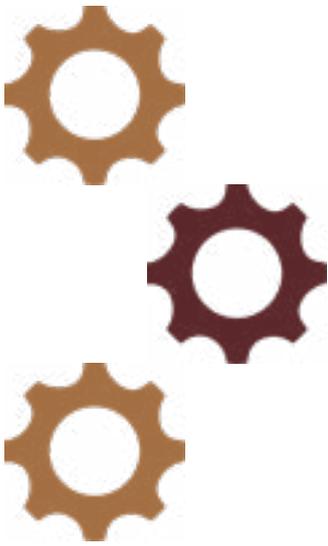
The great-grandfather of Friedrich Engels, the yarn bleacher and bandweaver Johann Caspar Engels I. (1715-1787) built in the 18th century a mechanical lace manufactory in the “Unterbarmer Bruch”. The swampy terrain was unsuitable for agriculture, but the wet meadows on the Wupper offered ideal conditions for the yarn bleaching, which flourished in Barmen and Elberfeld (now Wuppertal) for centuries. Friedrich Engels grandfather, Johann Caspar Engels II. (1753-1821) concentrated the families working for the Engels company in the “Engels-Bruch” into a factory colony and then to a decentralized manufactory. 38 workers’ houses were grouped here in a semicircle around the home of the Engels family. The former bleaching meadows are today the “Engels Garden”, a small park. The birthplace of Friedrich Engels, destroyed in World War II, was also here.



In the Friedrich Engels special exhibition, the historical situation of the “Engels Garden” with the workers’ houses and the houses of the Engels family will be resurrected by means of Virtual Reality. With Virtual Reality, visitors can experience the place at first hand during the time of early industrialization.

With the help of descriptions of the birthplace of Friedrich Engels, the Engels Garden and the company in the Engels family letters as well as photos, both in the city archives, as well as historical equipment from the Museum of Early Industrialization, a VR film can be produced, which the visitors in the exhibition can use with VR glasses.

Visitors have the opportunity to explore in a lively and interactive way the historic



spaces on the Engels Garden, which they are particularly interested in. They can watch the bleachers scoop water from the Wupper river with a kind of ladle, in German called “Güte” to keep damp the textiles that have to be bleached in the sun, which they have spread in the meadow. What do the rooms of the birthplace of Friedrich Engels look like? And what about the workers’ houses? This is how the visitors get to know the work of the Engels company, but also the environment in which the later social theorist and communist revolutionary Friedrich Engels (1820-1895) was confronted as a child with the life-world of his upper middle-class home and the great poverty of the working-class children. The visitors will be able to better understand how and why Engels later led a “double life”: as an entrepreneur and as a revolutionary.

It is possible to use an augmented reality app on a smartphone to visit today’s Engels Garden and to display information and historical photos of the Engels Garden from the archives of the early industrialization era. The visitor can view present garden and the historical garden at the same time.

## Interactive Links:

[Example of VR in the museum](#)

[Engels 2020 website](#)

[Engles 2020: Culture and Education article](#)



# History to be seen and heard: Historic Trail gets a digital extension

In January 2019, Austrian town Lustenau enhanced its already existing Historical Trail with digital assets, including 360° videos, texts and voice recordings, involving students of the local University of Applied Sciences.

In 2016 the municipality of Lustenau, a town with a population of 22.000 and a proud industrial heritage, created history trail in form of a folding map for bicycles. Containing 13 stations with 17 stories about important historic buildings, objects and sites, the town decided to create a digital version. They approached the writing workshop of the University of Applied Sciences (FH Vorarlberg) for an auditory concept. The students were tasked to standardize the writing style of the existing texts and prepare them for setting.



Users can access stations via a historical Map from 1957 on the website.

Jasmin Fischbacher, one of the involved students, describes the process:

“Already existing texts had to be rewritten. Because the content of the writing workshop was writing listening texts, this project was the ideal practical implementation. Each student received two texts for rewording. Because many different authors had been at work, we wanted to give the audio a uniform design. We searched for a common thread, which guides the user through the tour.”

In addition to a homogeneous representation, care was taken to ensure confrontation between the user and the site and its history. Four professional speakers were hired to do the recordings. Users are guided via suggestions, hints and background information to take a closer look at the scene. For each station a high-resolution 360° video was created, allowing a VR-experience if the user access to the equipment. The audio recordings are played automatically, giving the user a compelling story to listen to on their smartphone or pc, while actively looking around and zooming to points of interest.

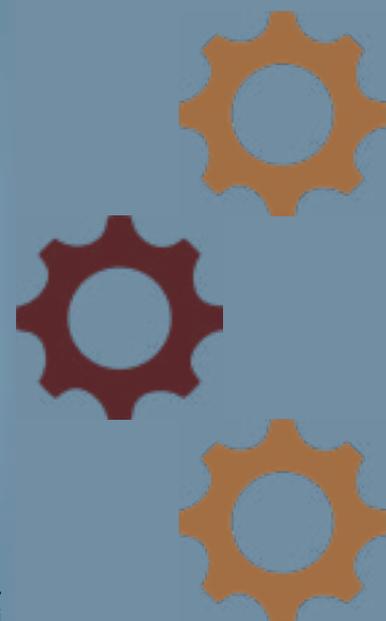
Users can access further information – texts and historical pictures, by clicking on certain symbols embedded in the 360°, turn on two different maps, one dating from 1957, the other being google maps, and thus compare the community development.

Switching from station to station is done via embedded video links or by accessing the map integrated on the municipality's website.

[Click here](#) to visit the project website.



A 360°-Photo was shot for every station.  
© Bernhard Belej



# Centro de Arte de S. João da Madeira: Can the Artist be a Machine?

S. João da Madeira Art Centre is a contemporary exhibition space located in S. João da Madeira, Portugal, that used to be an important factory and foundry in the municipality. Nowadays, art occupies the rooms where machines once were, but the building's industrial heritage is not forgotten.

Oliva was founded in 1925 and began as a foundry and a carpentry workshop. During its lifespan, Oliva suffered several merges and acquisitions, but it was after 1945, when the company was established as a sewing machines manufacturer, that it became one of the most relevant factories in the country. The Singer brand became the most important one in the market, and Oliva's In the late 90's, the company began to suffer losses, only to shut its doors on April 15th 2010.

In 2013, Oliva Creative Factory (nowadays Centro de Arte de S. João da Madeira) was created in the former Oliva building installations. The centre is home to significant art collections, mainly of contemporary and outsider art, and shows regularly those works in temporary exhibitions. In fact, Centro de Arte de S. João da Madeira is the only institution in Portugal specifically dedicated to art brut.



The contemporary art collection of Norlinda and José Lima and outsider art collection Treger/Saint Silvestre combined have more than two thousand works and around 500 national and international artists.

Centro de Arte de S. João da Madeira is also a place for education and debate on contemporary artistic practice, as well as a platform to experiment and promote emerging ways to make art, to develop new audiences, and to make art and culture more accessible to the population in general. In order to do so, the cultural centre organises several learning programmes for students and families, theoretical courses and creative workshops.

One of the learning programmes for families is called “Ocupação Oliva: Artistas XS a criar em Família XL” (“Oliva Occupation: XS Artists creating with an XL Family”). In this programme, the creativity of the artist is compared to that energy that feeds a factory, and the artistic process of making an artwork to that of machines handling. The main goal is to celebrate the factory’s beloved industrial heritage, while motivating the population of the municipality to engage with contemporary art.



## Interactive Links:

[Click here](#) for more information on Centro de Arte de S. João da Madeira, please visit the website,

or:

<http://turismoindustrial.cm-sjm.pt/circuito-torre-da-oliva>.



**Virtual Reality (VR):** is the use of computer technology to create a simulated environment. Unlike traditional user interfaces, VR places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds. Good examples of technology that supports VR are [Oculus](#) and [Google VR](#).

**Augmented Reality (AR):** is defined as the layering of digital images over the real world through a tablet or mobile phone. AR is an interactive experience of a real-world environment where the objects that reside in the real-world are "augmented" by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory. Once expensive to create is now affordable and in some cases free – an example of a mobile app to create your own AR experience is: [HP Reveal](#).

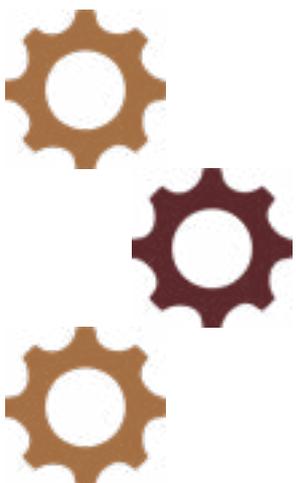
**360° video:** 360-degree videos, also known as immersive videos or spherical videos, are video recordings where a view in every direction is recorded at the same time, shot using an omnidirectional camera or a collection of cameras.

**Immersive Culture:** the act of surrounding yourself within a new culture or environment. In this context, Immersive Culture is experiencing a new skill or activity through interactive technology like VR, AR or 360 video.

**New Technology:** technology can be most broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort in order to achieve some value. In this usage, technology refers to tools and machines that may be used to solve real-world problems. In the context of "VIRAL" we are focusing on the new and emerging technology to support professional development and education.

**Pop-Up Outreach:** is an activity of providing services to any populations who might not otherwise have access to those services. A key component of outreach is that the groups providing it are not stationary, but mobile; in other words they are meeting those in need of outreach services at the locations where those in need are. In terms of being interactive and mobile, we use a variety of AR "markers" that trigger the interactive and 3D characters/ animations.

**Digitisation:** the conversion of text, pictures, or sound into a digital form that can be processed by a computer or mobile technology. In the context of "VIRAL" being able to digitise information can help provide more interactive resources to e-books and applications. Helping the reader fully immerse themselves into the educational material and use interactive references to view more information at their convenience.



# ViRAL - A Methodology for training low skilled adults using new technologies and heritage

Changes in the world of work affect everyone, but adults with a lower skill base are however likely to be affected most. Many low-skilled jobs can be automated the demand for their labour is decreasing. OECD research shows that jobs which require no specific skill or training have the highest risk of automation, e.g. food preparation and assemblers. At the same time, those with high technological skills become more employable (Nedelkoska and Quintini, 2018).

Adults with low skills can find themselves in a 'low-skill trap', in low-level positions with limited opportunities for development, frequently in and out of unemployed with limited returns to training, such as higher wages or access to better jobs (OECD, 2017a; Burdett and Smith, 2002).

Supporting adults with low skills to up-skill and re-skill is imperative for a future of work that is both more productive and inclusive. It helps individuals to increase their employability and ultimately their social inclusion.

Viral aims to address adults with a low – skill base through a program of non-formal learning. We have chosen to concentrate on EQF levels 3,4 and 5. There is no clear consensus on what constitutes non formal learning. However, for the purposes of the Viral project, we view it as learning

“...in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” Knowles, Malcolm S, Holton III, EF and Swanson, RA (2005) *The Adult Learner* (Sixth Edition), Burlington, Mass: Elsevier: 18.

To this aim Viral has developed a Continuous Professional Development (CPD) for adult educators supported by informal training exercises and trainer notes <https://viralquests.eu/> The methodology supports key competences as specified by the European Commission; STEM, Languages, Literacy, Digital Competence, Cultural Awareness and Expression, Entrepreneurship, Civic, Personal , Social and Learning.

Viral sets these competences in the framework of a Learning Outcome Matrix (LOM) <https://www.viraltraining.net/cpd-course>. The LOM presents the key competences to be achieved by adult learners in a context of safeguarding the memories of their local industrial heritage and using 360 vidoes, AR and VR to achive these aims.

# Contributing Partners

Partners will benefit from the opportunity of ERASMUS+ programme in support transnational cooperation among participating countries, including: Austria, Germany, UK, Sweden, Croatia and Portugal.

This is a valuable opportunity to promote mutual learning, share expertise and exchange practices among partners from two sectors: cultural heritage and adult education.

## COVENTRY UNIVERSITY, UK

As UK University of the Year for student experience (2019), has established regional, national and international presence with over 24,000 students from over 140 different countries, research ventures across the globe and international business activity, Coventry University aims to be at the forefront of immersive experiences.

## E-LEARNING STUDIOS (ELS), UK

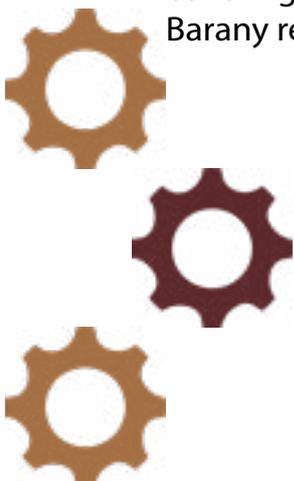
A limited company, based in Coventry (UK), that specialises in a wide range of technology for active learning. Aiming to be a e-Learning company that makes a measurable contribution to the performance of their clients and partners through the quality of solutions delivered.

## ELDERBERRY AB, SWEDEN

Elderberry AB has experience in developing material for adult education, heritage and culture, migrants and refugees and mobile learning and advanced IT skills/coding. The company is experienced with traditional methods for educational material and training with eLearning, mobile learning and eCulture.

## MUSEUM OF SLAVONIA, CROATIA

The largest general museum and one of the oldest in the Republic of Croatia, covering an educational role and exploring cultural life of Osijek, Slavonia and Barany region, being a relevant place of everyday life in Osijek.



## CITY ARCHIVE WUPPERTAL, GERMANY

The City Archives of Wuppertal documents the history and current affairs of the city and is widely available. The Archives are closely linked to the activities of the adult education Historical Centre with the Engels House and the Museum of Early Industrialisation and often involved with text contributions to the exhibitions of Wuppertal's industrial history and the history of the "son of the city" Friedrich Engels.

## STADTARCIV, DORNBIRN, AUSTRIA

The Town Archives of Dornbirn functions as a documentation centre for local history and as a service centre for all citizens, scholars and scientists interested in the past of Dornbirn. The initiative has won wide recognition from both professionals in the cultural heritage field and local citizens.

## ADPTN, PORTUGAL

ADPTN has been active since 1980 and is a nonprofit cultural organisation located in Torres Novas. Their mission is the safeguard and promotion of the natural resources, historical heritage and the intangible cultural heritage as well as the natural landscapes in the region.

