

Collectie van de Gentenaar

D7.2.2 & 07.2.1

White space

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Contributors: Pieter-Jan Pauwels, Pieter Van Kerkhove



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1. Introduction

This document serves as deliverable for D.7.2.2 and as output for 07.2.1 of the CoGhent-project, funded by the European funding program for regional development through Urban Innovative Actions (UIA). Its intentions and audiences are twofold. On the one hand, it provides a framework for those working on the intersection of cultural heritage, technology and neighborhood social cohesion, which this document refers to as the development of next-generation hybrid spatialized cultural interfaces. On the other hand, it provides a framework to drive developments within the CoGhent-project forward.

The CoGhent-project is active in the City of Ghent, Belgium (2020-2023). The municipality wants to connect local citizen-centric cultural heritage and the collections of the city's museums through a central open data system. With the CoGhent-project, the foundation of this ambition is being developed. In addition, the project aims to improve cultural participation and social cohesion in public and third places through the use of this data and visualizing it in an immersive digital experience room. By linking heritage on a city level and using it to capture and show stories in cultural public spaces, the aim is to leverage digitized heritage to be used in an engaging and purposeful way, as a shared connection amongst citizens.

Technology and visualization – aka Work Package 7 - is about creating an immersive digital experience room that we call the White Space (aka the CoGhent Box). This CoGhent Box is a mobile and museum agnostic space that has two main functions:

- to facilitate interactions between citizens and the digital heritage collection of Ghent
- to add more objects and stories to that collection through participatory technology

In this document we describe

- **Output 07.2.1 White Space (aka CoGhent box):** The mobile and immersive digital experience room that contains all the hardware to connect with the data in WP5. This white space is used in the different neighborhoods of Ghent and is controlled by the software of the visualization layer in A7.3. Involved partners: PP4, PP7, PP10, PP11
- **Deliverable D.7.2.2 White Space setup (aka CoGhent box):** Based on the learnings of the projects and those generated within the devkit space we have built a White Space that is the digital experience room that is tested in the different neighborhoods. Meaning this space has – A mobile construction we can set up in different areas – A predetermined size and esthetic that fits the agnostic digital experience room feel for museums. - Fixed technologies embedded in the interior to fit into the aesthetics as well as to prevent theft and loss of materials. Involved partners: PP4, PP7, PP11

2. Topics and definitions

In the Collection of the Ghent, a number of substantive agreements have been made about the subjects in this project. In this section, we describe those different topics and definitions.

2.1 CoGent box

A high-tech immersive and interactive experiential space. This will be built up in three Ghent districts and serves on the one hand as a physical space that wants to immerse the citizens and gives access to the cultural heritage that is present in the Collection of the Ghent residents and on the other hand also wants to promote social cohesion in the neighborhoods.

2.2 DAMS - dams.collectie.gent

The images of the Collection are managed in an image management system or DAMS that is being developed as part of this project. The DAMS feeds the CoGent box with media material and associated metadata. The metadata is synchronized from the LDES. The DAMS also makes the linked open data available again via an LDES so that the enriched data in turn becomes available again for other platforms and applications.

2.3 Webplatform - collectie.data.gent (webplatform)

The web platform is an online environment where citizens can access the public heritage material that is present in the DAMS. You can see this platform as a user-friendly presentation layer that lies on the DAMS and that should make it possible for citizens to discover, enrich and inspire citizens to get started with this material themselves.

2.4 LDES

The [Linked Data Event Stream](#) (LDES) specification is a way to publish data via a low-cost web interface for both client-side and server-side (technological interoperability). The project implements machine-readable standards (i.c. OSLO Cultural Heritage Object and OSLO Cultural Heritage Event), and can publish both the history and the latest changes or modifications of a dataset (semantic interoperability).

2.5 Immersion

Immersion is generated in the CoGent box by surrounding the user via technology with images, sound or other stimuli that simulate a total experience. Immersion we approach as immersion to generate amazement.

2.6 Interaction & input

Interaction in the CoGent box stands for the interaction between the data of the collection and the citizens. The interaction takes place in the CoGent box, because citizens are able to search the collection, question it and dive deeper into it. This is a functionality of the CoGent

box. This exploration is further discussed in the document when we further explain the concept of passive participation.

Furthermore, we stimulate both reuse and enrichment of the collection by also offering the possibility to add and annotate things via data.collectie.gent. We consider this to be active participation.

2.7 Inclusion

We implement two basic sets of rules that promote inclusivity:

- [WCAG Guidelines](#)
- [Stedenbouwkundige wetgeving van 2010](#)

In addition, we base ourselves on the City of Ghent inclusion action plan 2020-2021 with the slogan "Working on an accessible Ghent, even before the first step."

We concretize this by submitting our plans to a sounding board group at four crucial moments:

- before the concrete plans are drawn up for the CoGent box
- with the first concrete version of the plans of the CoGent box
- at the final design of the plans of the CoGent box
- in the implementation of the plans in the first district

The Ghent 'inclusion sounding board group' is convened every two weeks by the accessibility officer Bart Vermandere. It consists of a diverse group of experience experts from the Ghent infrastructure.

The feedback is included throughout the process in the further elaboration of the CoGent and where possible implemented in the CoGent box.

In addition, we include the following three rules in the design and development of the white space:

- for everyone in a wheelchair
- experienceable for everyone (regardless of the disability, everyone can get something out of the experience)
- do not need your own device

3. Physical and technical description of the CoGhent box

3.1 CoGent box: exterior

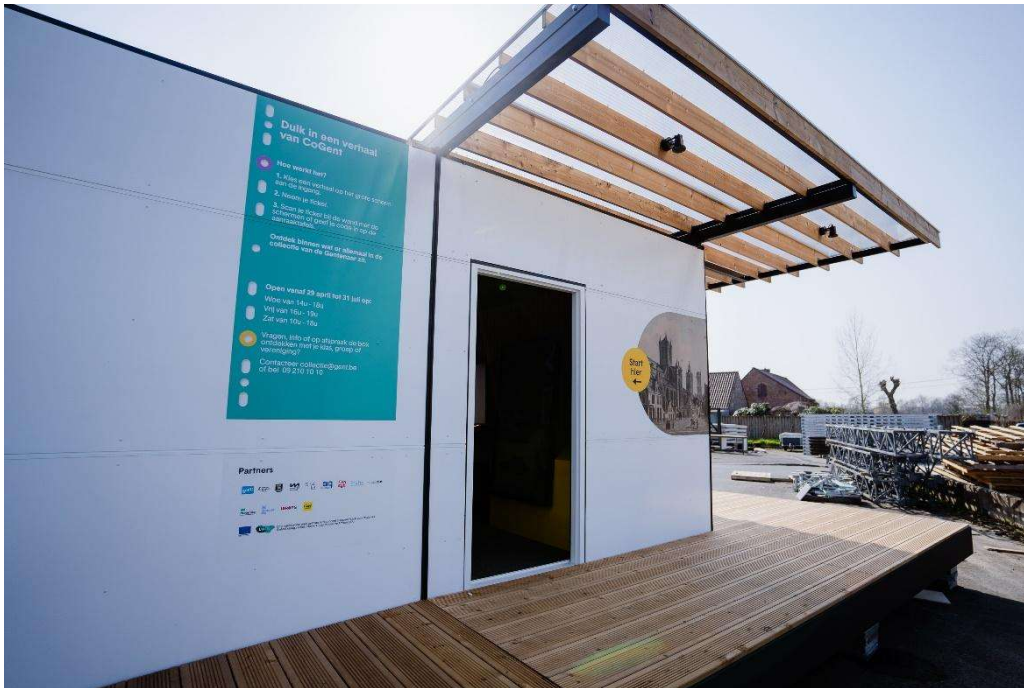


Image of the entrance side CoGent box



Image of the exit side of the CoGent box

In this section describe in detail the outside of the CoGent box, what shape it has and why we choose that specific shape. In addition, we describe the materialization: which materials do we use to realize the CoGent box.

The CoGent box is structurally constructed on the basis of three 20 foot container modules. These container modules ensure the structural strength of the CoGent box and are decorated with an inner and outer shell that provide the finish. The external dimensions for each of these modules are: 6.6m deep, 2.59m high and 2.44m wide. The use of the container modules makes it possible to minimize the construction and dismantling phase on site in the district and to prepare as much as possible in advance in the workshop.

The container modules give an advantage to transport. These can be transported with a standard truck and the modules can be placed on location and attached to each other on the basis of the crane of a truck. All additional elements of the design of the CoGent box that are attached to the container modules outside are designed in such a way that they can be transported as much as possible in the container volume. This way we limit the number of trips that have to be made to get everything on location.

The CoGent box has an input on one long side and an output on the other long side of the volume. The entrance is made accessible to everyone by means of an inclined plane. This sloping surface leads up to the entrance where you can wait outside under a roof. This way you don't have to wait in the rain until other visitors leave and there is room inside to experience your visit. Given the limited space at the various locations where the CoGent box will be located in the neighborhoods, we cannot provide an inclined plane at the exit. This means that, for example, wheelchair users must also leave the CoGent box along the sloping surface at the entrance.

Both the entrance and exit can be completely closed with a door. All valuable and vulnerable technology is behind these doors and can therefore be safely closed at night to minimize the risk of vandalism.

One of the short sides of the box is finished in a plain material (plywood sheet or similar) and consists of some round panels that can be detached from the CoGent box. These three round plates serve as a canvas for the neighborhood to decorate and personalize the CoGent box during the neighborhood period. Under the guidance of various neighborhood activities that are set up from WP6, citizens will be allowed to decorate this wall in a creative way. Every time new panels are installed in the new district. It is possible that part of the personalization in the previous district (painting, photo material or other attached material to the canvas walls) will be taken to the new district and thus cross a part of the neighborhood.

On the outside of the CoGent box, there is also a roof under which an outdoor space is provided. A screen has also been incorporated into the outer wall under the roof. This outdoor space gives place to the various activities that WP6 is setting up together with neighborhood organizations and residents. This outdoor space serves as a stage, to come together in a small group and work on something in workshop form, etc. When no activities are organized, this covered outdoor space mainly serves as a place where people can sit down to enter the CoGent box. In this way, people queuing up are not waiting in the rain.

The outside of the CoGent box is partly finished with a structure made of wood. Behind this structure, LED lighting elements are present that can be controlled to display light animations that are linked to the activities that take place in the CoGent box. For example, if there are no visitors in the CoGent box, the light animation can become more 'cheerful' and more noticeable to attract visitors to the CoGent box.

Ultimately, these lighting animations mainly serve to increase the visibility of the CoGent box from a distance and to give the CoGent box a dynamic appearance. This extra visibility is important during the autumn and winter months when there are many dark and short days.

The rest of the box is finished with a metal outer shell in a light color. Graphic elements can be applied to these surfaces on the basis of stickers that dress up the CoGent box in the house style of the project. In these graphic elements, various communicative and wayfinding elements can be incorporated that will inform and guide the visitors.

3.2 CoGent box: interior

3.2.1 Assets, frames, stories

The interior is setup in such a way we can bring the digitised collection to citizens in a readable and layered way. We looked for a system to bring clarity, and to use a common semantics in the project of the Collection of the Ghent native.

We make a distinction between three main components:

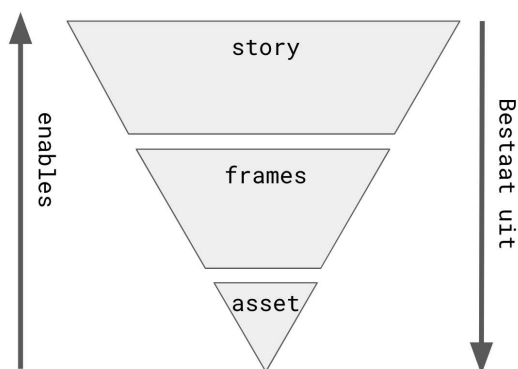
ASSET: an asset is an object (media) and its associated descriptive metadata. For example: "the Kuip van Gent", an image of a specific object or an audio recording with a testimonial. Metadata is available for each of these assets: location, period, maker...

FRAME(S): A frame is a thematic or narrative cluster that can consist of at least 2 or more assets and that contains the necessary framework / context by adding existing or new assets.

This can be, for example, an audio recording of someone telling about a specific asset from the collection, and images of three related assets.

STORY: A story consists of a collection of frames and assets.

For example, over time periods you get an overview of certain people who have come into contact with similar assets from the collection in a number of locations, with the underlying frames each dealing with an individual time period.



The CoGent box shows the assets and frames in the immersive experience. The frames are displayed on the 180 wall in the CoGent box and are central to the experience that you as a visitor experience on this interactive display wall. The assets are the core of what you can do at the exploration table. We provide an online interface via the web platform to put together those frames, by making a combination of different assets.

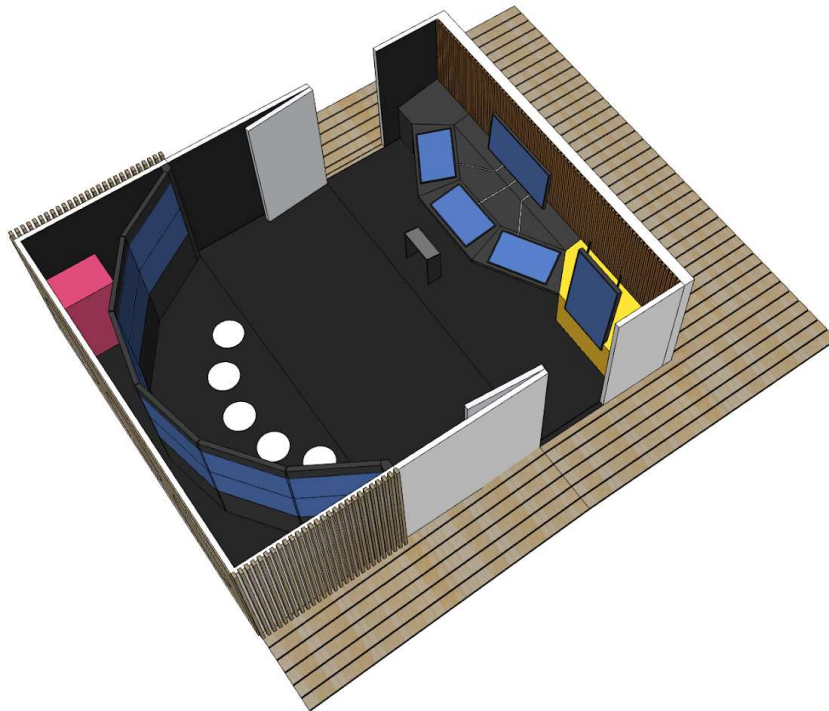
A frame consists of a grouping of different assets. The frames will be stored in their own Linked Data Event Stream alongside the institutions' existing collections. Consequently, frames are also semantically described and interconnection is made possible. This allows the visitor of the CoGent box to navigate from one frame to another "related" frame via the interface.

Frames can be designed by anyone, not in the CoGent box, but via the web platform. Upon creation, the frames are given a unique number, making it possible for a visitor - in addition to the five starting frames provided by the Collection of the Ghent resident - to select their own frame as a starting point. Then, on the 180 wall, the linked data principles navigate from one frame to another frame (based on shared assets).

'Stories' are designed by employees within the 'Collection of the Gentenaar' project where the content is provided by the end users: institutions, citizens, schools, local history circles, etc. As defined earlier, a story is a sequence of different frames that logically belong together by a certain element (a shared theme, a certain person who returns in each frame, an asset that is shared within the different frames, ...). The CoGent box will be the only place where you can view these stories. By taking a seat as a visitor at the 180 wall in the CoGent box you will be able to view and listen to the various stories here. We provide a number of stories that can be viewed in the box from day 1 in the first district (between 3 and 5 stories). These will be further supplemented over time when the project is present in the different districts.

Via data.collectie.gent, citizens have access to the entire collection of ghent residents from home. Through this web platform, citizens can upload and add their own assets to the collection, combine assets in a self-assembled frame and/or consult the entire collection of assets and frames.

3.2.2 Interior setup



Overview arrangement inside of the CoGent box

The inside of the CoGent box is set up as 1 large open space. There is an entrance on one side that is accessible by means of an inclined plane for people who are not able to walk well. Visitors who are able to walk well can step along the other three sides to the wooden floor that surrounds the outside of the CoGent box. This wooden floor has a height difference of less than 20 cm compared to the ground, so no stairs or railing have to be provided here. The visit to the CoGent box consists of 3 important parts, each with its own interface. In order with which a visitor comes into contact with this, these are the **welcome & choice screen**, the **180 wall** and the **exploration table**. Depending on when the various activities that are organized from work package 6 (participation and co-creation) will also be something to do at the **outdoor space** under the roof where a screen is also placed.

The design of the CoGent box is two-part. On the one hand she teaches users the technology, on the other hand she is focused on directing visitors to and giving them control over how they experience the collection.

3.2.3 Flow

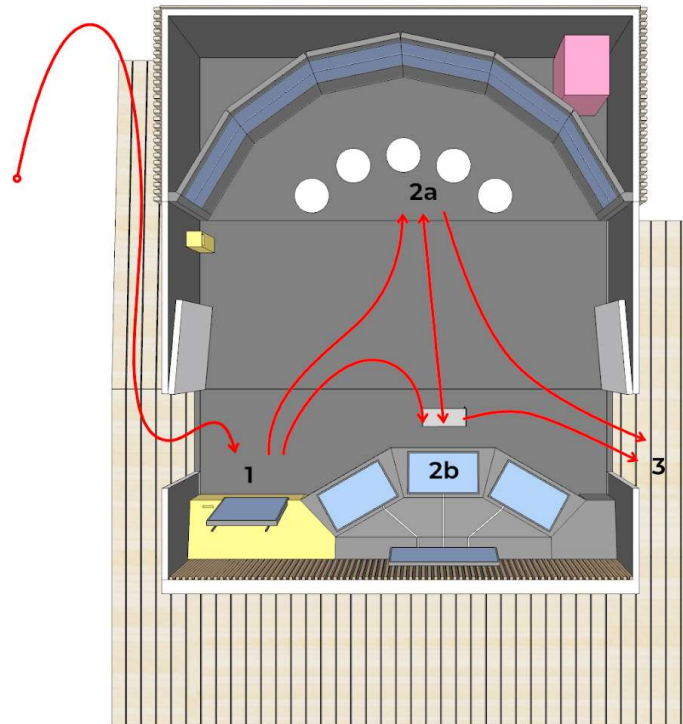
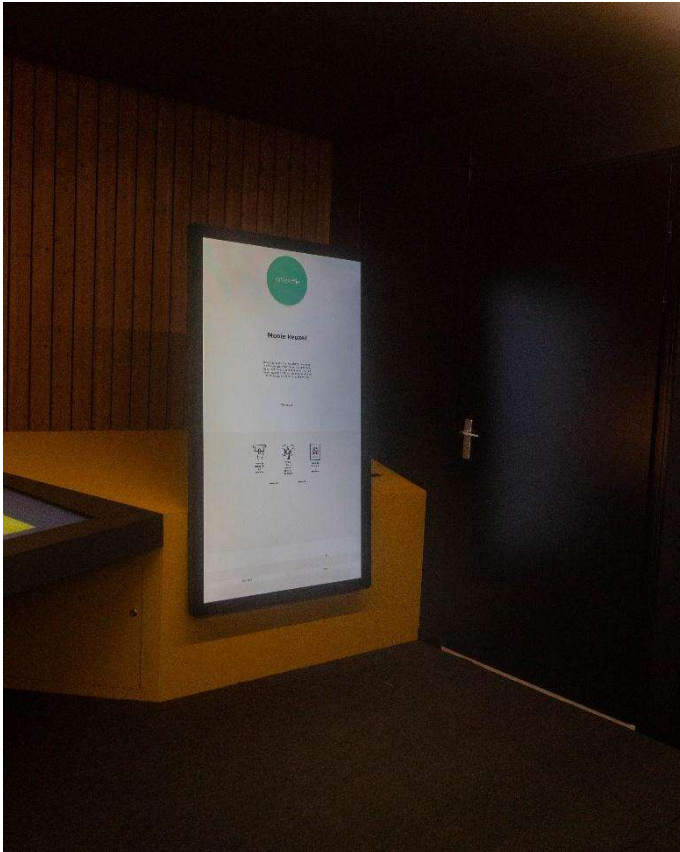


Diagram of the flow through the CoGent box

A visitor starts the visit on this schedule on the left. By taking the inclined plane, the visitor arrives at the entrance along the left side. Upon entering, the visitor arrives at the welcome & choice screen (1). After this, the visitor has the choice to sit at the 180 wall (2a) or at the exploration table (2b). This choice is made by the visitor on the basis of where there is still room to stand in front of. At the 180 wall, one person or one group that has come together can use the interface. At the exploration table there are three places where someone can stand in front of. The experience can start both at the exploration table and at the 180 wall. When a visitor has used 1 or both interfaces, he leaves the Cogent box through the exit along the right side (3).

3.3 Cogent interface 1: Welcome & choice screen



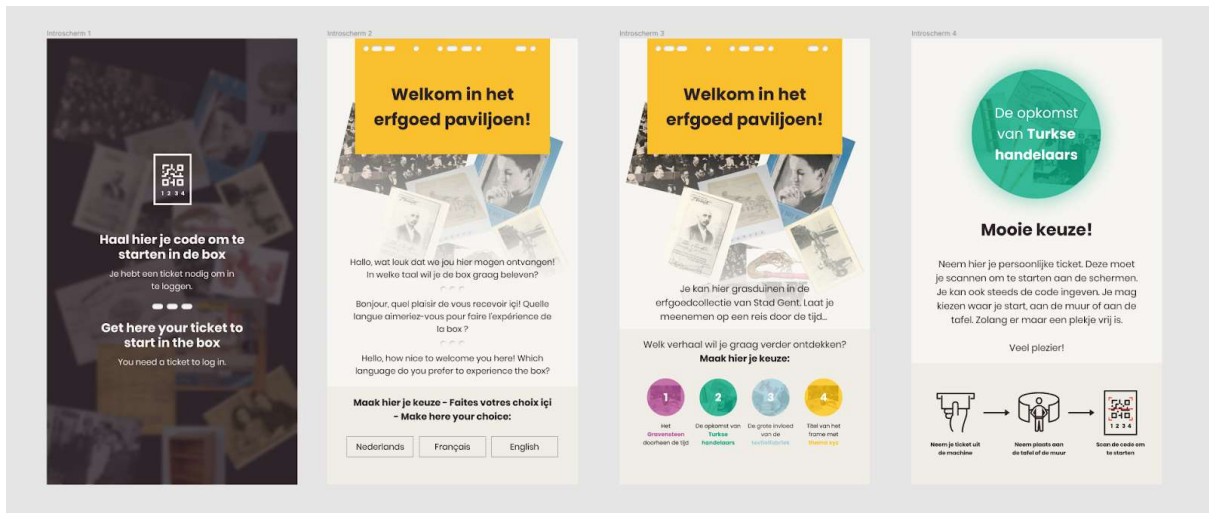
Interface 1: welcome & choice screen

This first interface is located just at the entrance of the CoGent box. The interface consists of a portrait-mounted 65-inch touchscreen incorporated into a fixed piece of furniture. This screen is controlled by its own individual computer. This is the first element that a visitor can interact with during the visit.

This first step in the visit has a number of functions. First of all, it allows visitors to get acquainted with the CoGent box in a visual way and explains to them what they can expect from their visit on the inside. View this as an introduction and explanation of the possibilities during the visit.

As a second step, it allows the visitors to make a substantive choice about the starting point of the experience once they enter. Then you can choose one of the available stories on this touchscreen to start your experience in the CoGent box. When all the necessary choices have been made by the visitor on this screen, a paper ticket comes from a small printer on the right side of the touchscreen with some extra explanation, a numerical code and a QR code. This ticket is used by the visitor every time they start a new interface.

The third important function of this first screen is to check the inflow of visitors who enter the CoGent box. When all available places inside the CoGent box have been taken, this screen can indicate when the next person or group can enter to start the visit.



Some examples of what can be seen on the welcome & choice screen

A visitor can also enter his own code at the welcome screen that has been obtained via the web platform. This code makes it possible for a visitor to call up a self-made frame on the 180 wall. Codes can be passed on to people so that someone can, for example, prepare something at home and give it to a friend to go and see in the CoGent box. This code is also the access for, for example, classes, theme days, neighborhood activities, etc. to call up specific frames in order to bring your own narrative stories in the CoGent box.

3.4 Cogent Interface 2: 180 wall



Interface 2: 180 wall

On the inside of the CoGent box there is one 180 wall.

On the screen of the 180 wall, the focus is on introducing the visitor to some interesting stories based on heritage assets from the collection. We do this on the basis of the narrative frames.

The 180 wall consists of 6 wall segments that connect to each other at an angle to form a curved wall that occupies the full width of the CoGent box. Two 55-inch LCD screens are mounted on each wall segment that connect as closely as possible to each other. In total, each wall consists of 12 screens that will be experienced as 1 large continuous screen for the visitor.

LCD screens have been chosen as technology for the display wall in function of a number of concrete limitations that must be taken into account: budget, image quality, the relatively low ceiling in the CoGent box and the need for interaction. LED video wall screens could have been an alternative option because they can achieve the same effect as the LCD screens and LED screens are even more visible if direct sunlight were to fall on the screens from the outside. Due to the limited budget, LED video walls are not an option as they would be much more expensive than the chosen LCD screens.

A second alternative that was considered is the use of short-throw projectors. The advantage of this technology is that with only a few devices a very large surface area can be used as a display. As a result, almost the entire wall could be used as a screen from floor to ceiling. This technology was not chosen for a number of reasons. First of all, the light output of the projectors is much lower than that of the LCD screens, so that the image would be much less visible if sunlight were to fall on them. The ceiling of the CoGent box is also relatively low, so installing the projectors would not be easy. And because of the interactive nature of the screen, where a visitor is relatively close to the screen to be able to operate it, a visitor would soon be in his or her own shadow, so that part of the image falls away and shines on the visitor.



For the 180 wall, 5 luminous tiles have been incorporated into the ground. From these tiles you can control the visualizations on the interface of the 180 wall. Above these tiles are sensors in the ceiling that can detect per tile whether someone is underneath. By measuring the location of users along the top, we avoid problems with pressure sensors etc. on the ground. We think of pollution from soft drinks or other waste, blocking buttons, wheelchair users who cannot easily press the button and other situational problems. To avoid

interference from other users in the CoGent box, you can only activate the next luminous tile once you have left the previous one.

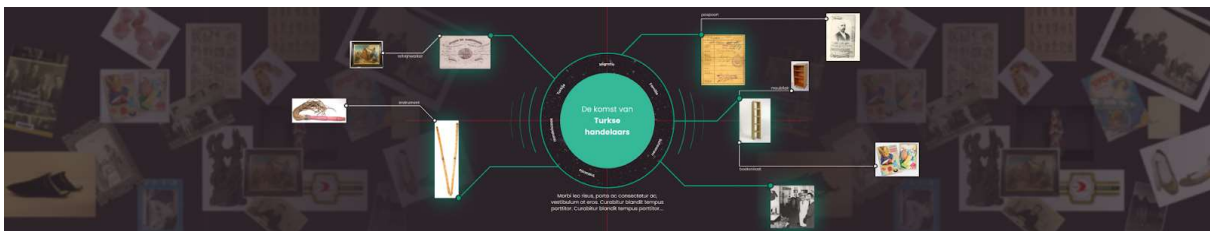
When a visitor starts at the 180 wall, he or she must first scan the QR code on his ticket that he or she received at the welcome screen at the entrance. The visitor can do this by holding the ticket in front of the scanner that is processed in the wall on the left side of the 180 wall.



The interface of the 180 wall points the visitor in the right direction to start

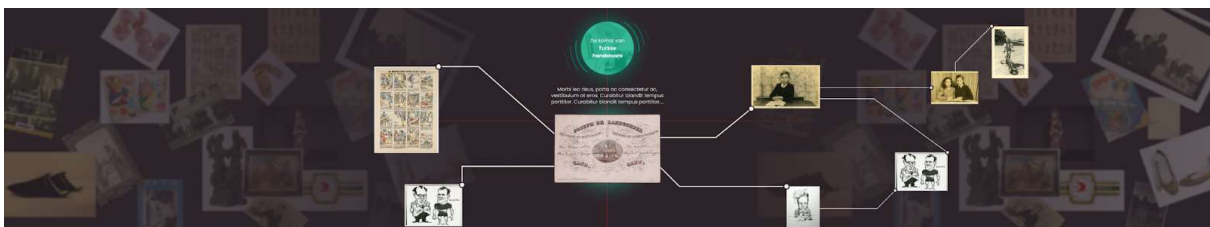
Once the visitor's ticket has been scanned, the display on the 180 wall changes.

A luminous tile indicates where the visitor can stand to see the first frame. Once someone stands on the tile, a sensor activates the frame and starts the audio/video. The images in the frame are enlarged on image. We take into account that not all images are of the same quality, and enlarge as long as the images are not pixelated.



Interface 2: 180 wall visualisation

The 180 wall visualizes the relationships between assets within a frame and thus shows semantic connections. On the ground, the tiles light up in a color code related to the connected assets/frames. By standing on the luminous tile you get to see/hear the next asset/frame.



Interface 2: 180 wall visualisation

Based on visual and audio feedback, the user knows that his chosen 'sphere' or frame is activated. Color codes should increase the readability of the wall and navigation. As long as the visitor remains on the chosen tile, the frame automatically plays out on the 180 wall.

When a frame has ended, the visitor gets an overview of the different possible options that can be chosen. These consist of the following frame within the story that the visitor was viewing and the beginning frames of the other stories that can be viewed in the CoGent box.



Interface 2: the visitor sees a notification that the current frame has ended and sees an overview of the other frames that can still be viewed

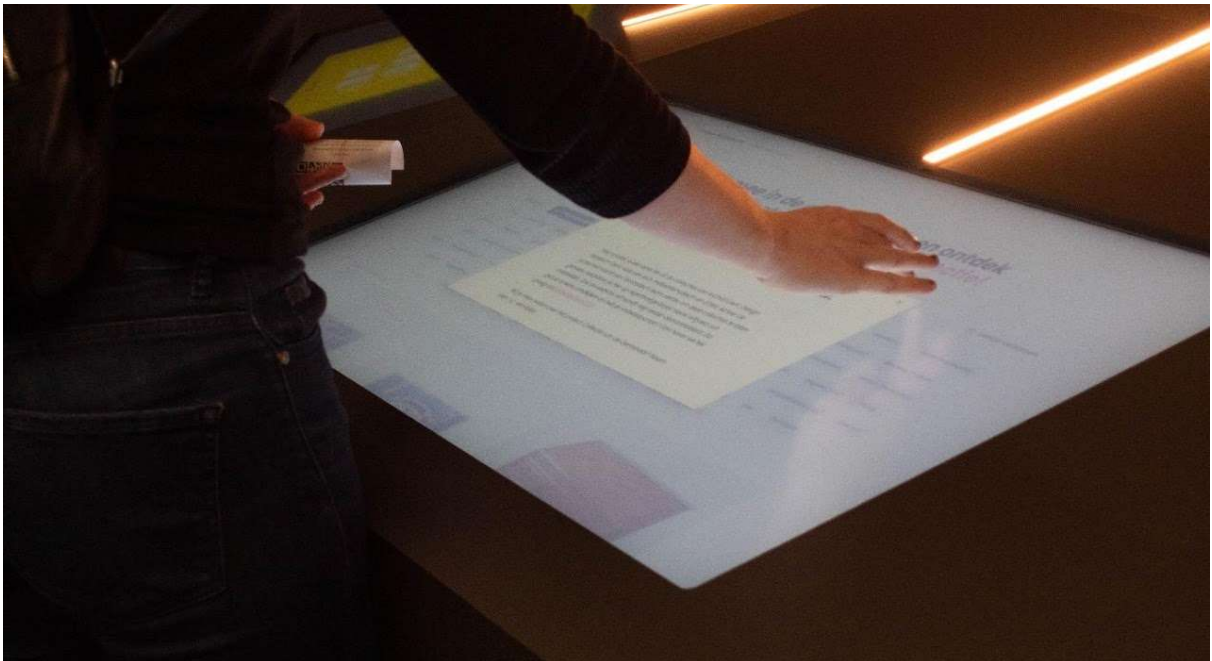
To choose a frame that builds on the frame that the visitor has just seen, the visitor stands on a tile that has the same color as the previously viewed frame. By standing on a tile that has a different color, you start a frame that is in a different story and will therefore be about a different subject.

The colors of the tiles correspond to the colors on the wall. The experience ends because you come to the end of one of the stories, because you have viewed all the stories or because you yourself step out of the experience before.

Above the screens of the 180 wall are some audio speakers in the wall. These are directed towards the luminous tiles on the ground so that a visitor standing on one of the tiles can best hear the sound.

Space is provided so that visitors who come in a small group have enough space to watch the 180 wall without having to stand on the other tiles. Only one person can control the interface each time using the tiles. This person can alternate with someone else in the group to give everyone the chance to control the interface.

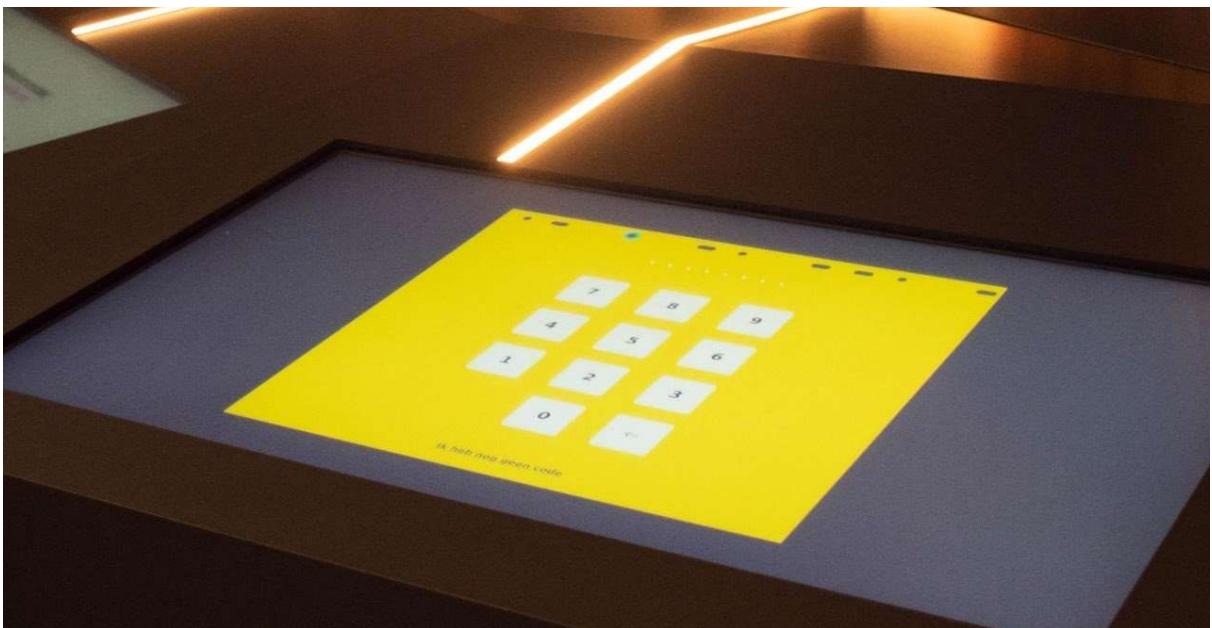
3.5 Cogent Interface 3: exploration table



Interface 3: exploration table

The exploration table is the place where users can freely navigate through the entire collection. It consists of three touch screens around a fourth screen in the middle of the wall. A maximum of three users can use the table at the same time. Each user at the table is shown their own network visualization of the collection that they can control individually.

Logging in to the exploration table is done by entering the numerical code that is on the visitor's ticket.



Interface 3: Inlogscherm

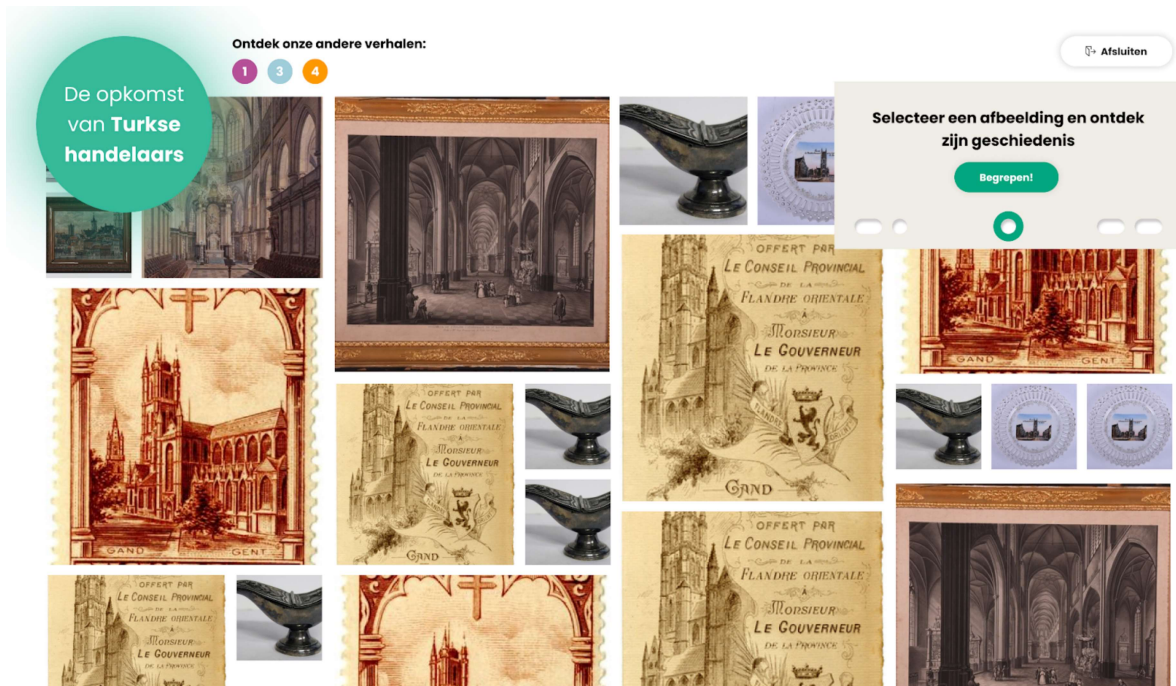
When starting at the exploration table, there are two possible scenarios. In the first scenario, the visitor comes directly from the welcome screen to the exploration table. This visitor has not made any other choices or viewed substantive frames besides choosing a certain story. When registering on the exploration table, this visitor will see an overview of all the assets that can be found in the chosen story.

The second scenario consists in the visitor starting at the 180 wall and only then coming to the exploration table. In this case, the visitor also gets to see an overview of different assets. The difference here is that we make a list of the different frames that the visitor has just viewed himself at the 180 wall. The frames that have not been viewed on the wall will not appear in the overview of this visitor.



When a visitor has already viewed a few frames on the 180 wall, after logging in, it is displayed from where the various assets on the start screen of the exploration table come from

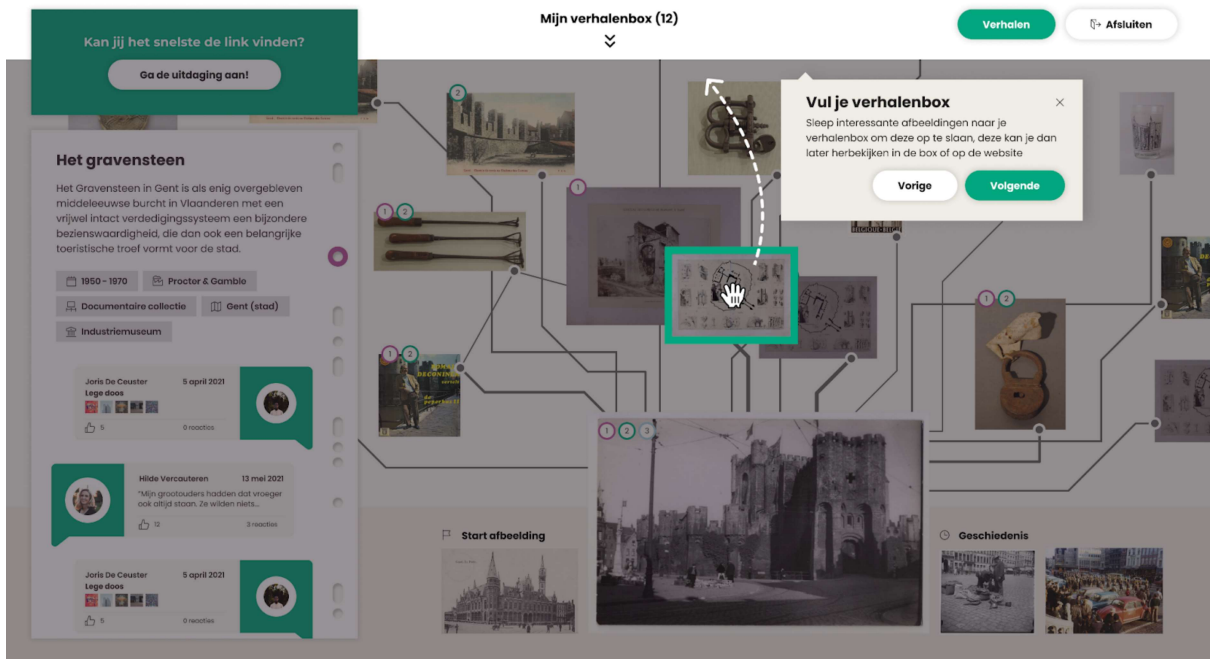
The assets of the chosen 180 wall are then collected on the screen on the wall and placed in the story box of the visitor's screen.



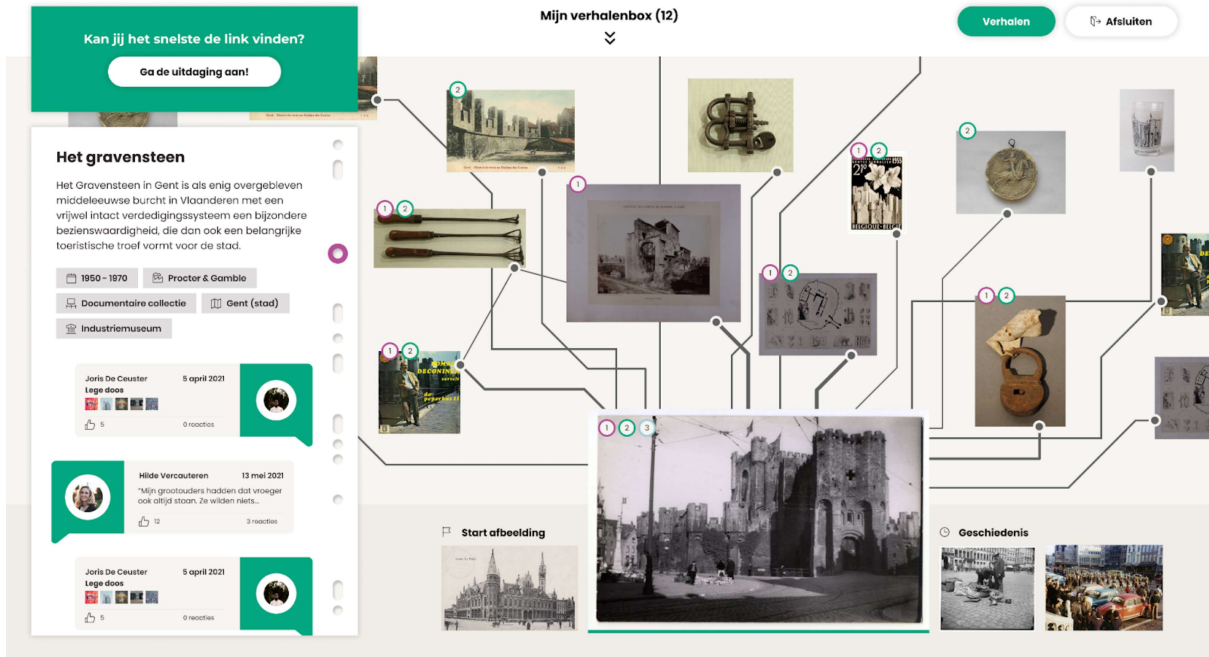
Interface 3: Story box based on previously viewed frames

The visitor can start by selecting an image from the stories box to explore the linked assets to this image.

The visitor is guided through a short introduction that briefly explains the most important functions of the exploration table. After this, the visitor can start freely exploring the entire collection.



The visitor receives a short explanation of the interface via tooltips



Interface 3: Screen showing linked assets to the user's chosen image

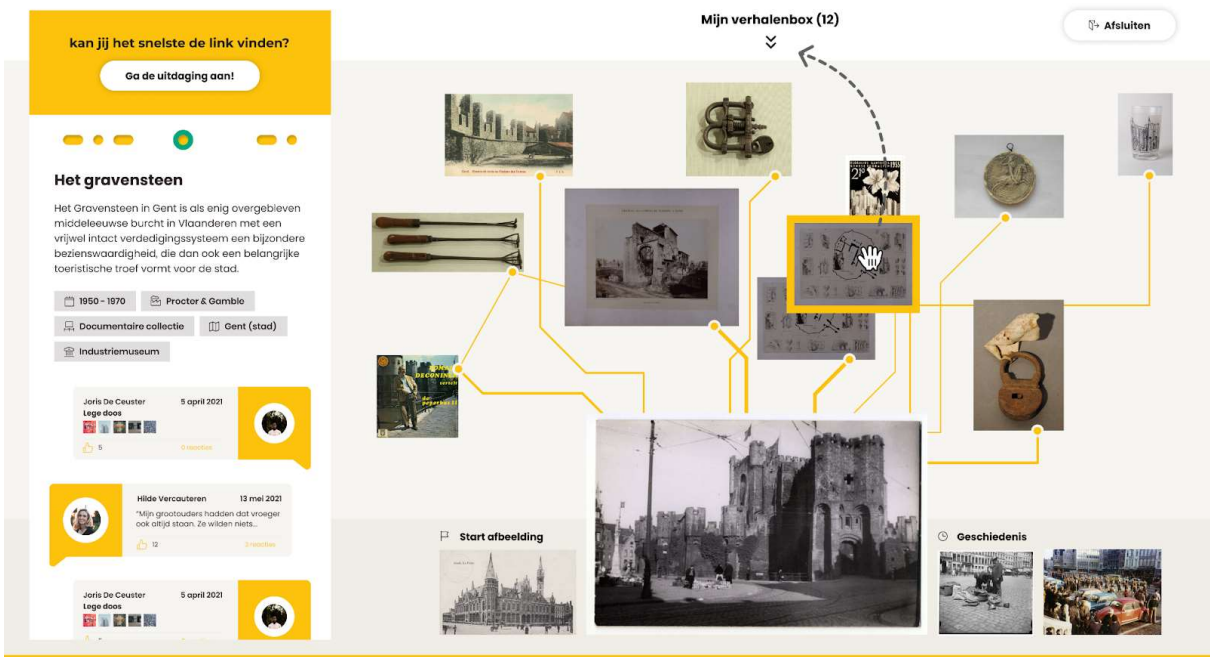
When the visitor chooses an image to explore further, the network view is shown. At the bottom of the network view, the selected image is in the middle. From this image, the links with the related assets are shown based on the nearest neighbour. On the left side, the detail info of the selected image is shown.

The visitor can click through on images that are displayed in the network. When selecting an image in the network, it moves to the bottom of the screen and this asset is used as a new starting point to base the network view on. The previous image is made smaller and is tracked in the search history bar so that the visitor can easily return to it.



Interface 3: Enlarged view of an asset

By clicking on the central asset in the bottom bar, it can also be enlarged to view it in detail.



Interface 3: Dragging an asset into the story box to keep track of it

Users can drag an asset from the network view to the stories box. By dragging these to the stories box, they can keep track of them and continue working at home on the web platform.

In the story box, images can also be removed by dragging them out of the stories box. This gives the visitor full control over which assets are interesting and which are not.

The exploration table has the functionality of exploring the entire collection. Users can take their 'stories box' home with them by bringing a unique six-digit code from their ticket and re-entering it at home on the web platform. The code they receive there gives them access in the web platform to the assets they collected in their exploration in the CoGent box.

4. Future use

The final activity in the technical work package (WP7) is about gathering all learnings about the technological setup and results and translating this into a preliminary plan to enable a permanent immersive experience room into the new wing of the Design Museum Gent, serving as a third place connecting the museum and the City. This plan will show in a detailed fashion how the technology within the White Space can be repurposed into the new building, what hardware purchases are needed to complement the current availability and what interactions will be available in this new space.

This future use will be described in **Deliverable D 7.5.1 Final integration plan**.