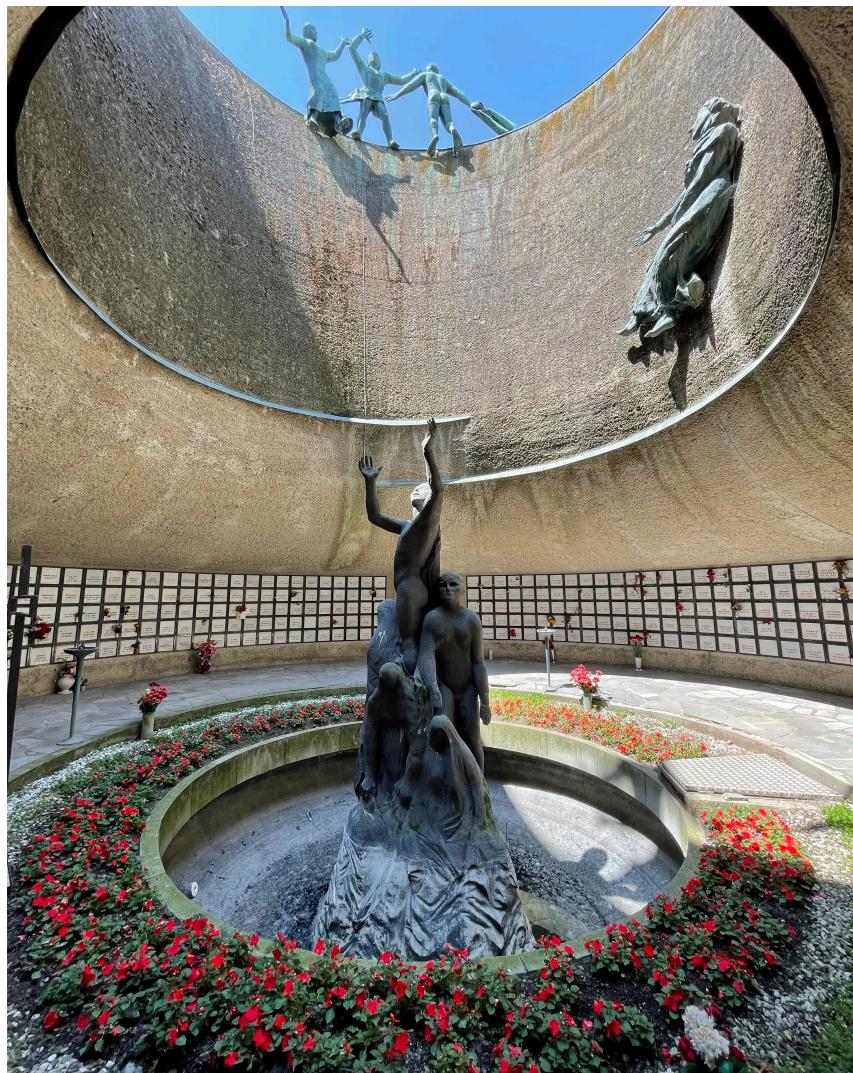


CeRTo

A Certosa Respectful Tour - Design Brief



To the attention of Istituzione Bologna Musei.

A cure of:

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INTRODUCTION

The CeRTo project born with a clear idea in mind, we wanted to a respectful tour of the Certosa open-air museum.

The Monumental Cemetery of Bologna is famous for its incredible collection of works of art, the main witnesses of the Neoclassical style in Italy and this is one of the main reasons for which we choose to dedicate our work to this incredible location.

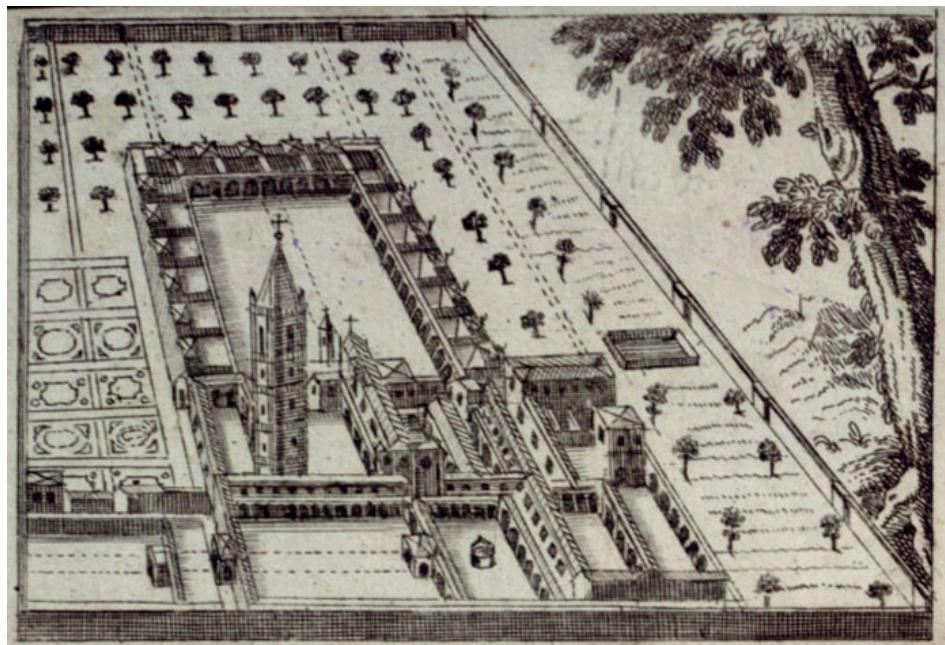
The biggest challenge we faced, as we will deeply discuss below, was to create a non-invasive application that could let the users, and by consequence visitors, to enjoy each aspect of the historical heritage of this place and to also appreciate the immense Cultural Heritage preserved in it. All of these without disturbing an holy and extremely precious place.

CeRTo is an interactive application that allows users to visit the Certosa with a virtual tour full of widgets and information to discover all the history about the Certosa and a in-loco experience in which a virtual guide, an ancient keeper of the Certosa, will accompany the visitors along the main point of interests, interacting with them and telling interesting stories. The idea to develop a double-faced application comes from the will to promote the place and the right behaviors to maintain within it in order to attract visitors and arouse in them a sense of care with respect to Cultural Heritage sites in general.

CONTEXT

SOME HISTORY

CeRTo project has the aim to promote the *Certosa* open-air museum, located in Bologna and founded in 1801 from the structures of the Carthusian monastery, from which the Monumental Cemetery's name comes from.



Carthusian Monastery, Bologna. Sec. XVII
Image rights of Comune di Bologna

At the beginning, the works were aimed at restructuring and preserving the old spaces of the monastery but then, starting from 1816, the purpose changed and all the works done in the cemetery started to add complex geometries and intricate shapes to the original structure. During this period, the ambitions regarding the place shifted towards the creation of a monumental and immortal place. These ambitions have been completely satisfied, and that is pretty obvious by simply looking at the two centuries of Renaissance art¹ that have been perfectly preserved and are freely accessible nowadays.

¹ The monumental cemetery of Certosa is a collection of great works of art, not only coming from the renaissance period. Inside the cemetery, just to cite one of the many artistic styles, it is possible to see some of the best examples of the Italian Liberty, an Italian variation of art Nouveau, which flourished between 1890 and 1915.

As testified in (1), the heart of the cemetery is the third cloister, a perfect example of Bologna's neoclassical culture. Around it, between 1816 and 1834, the main rooms of the Certosa were built².

Moreover, it is also important to know that with the construction of all these buildings also an Etruscan Necropolis have been discovered under the spaces of the monastery in 1869. With the ongoing works of excavations, also a lot of the buried history of the ancient Bologna started to be discovered.



Sixth Cloister
Image rights of Museo del Risorgimento di Bologna.

victims of the World War I but it also presents a monument from one of the darkest periods of history. Placed at the center of this cloister a monument to "celebrate the beginning of a new era", that started with the March on Rome, has been erected.

Such museum belongs to *Istituzione Bologna Musei*, an institution that recounts, through its collection, whatever regards the history of the metropolitan area of Bologna, combining together the first prehistorical settlements with the contemporary dynamics of the cultural heritage of the city.

After this important period of renewal, a new wave of changes has come at the beginning of the twentieth century. These changes has led to a different conception of the spaces and to a renovation of them. A great example of this now consolidated monumental and rhetorical viewpoint is the Sixth Cloister, which contains the World War I Memorial. Such cloister is the most monumental of the cemetery, it contains a memorial of the fallen soldiers of the Great War, and is composed by two communicating circular ossuaries below ground level. This cloister not only remembers the



Ossuary of the fallen during the Great War

² The main rooms to which we refer to are in particular the "Hall of the Graves", the "Arcade of the Graves", the "Colombario", the "Gallery of Angels".



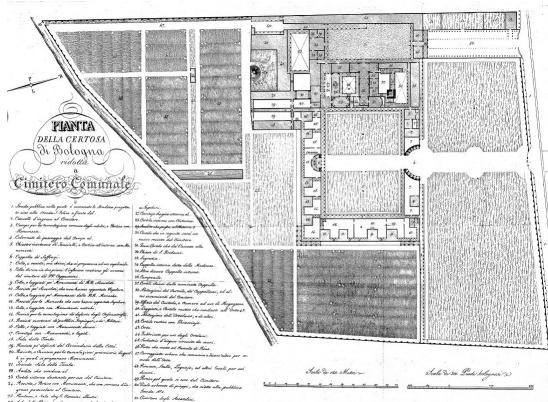
The institutional goals appear to be the promotion, restoration and conservation of all the cultural heritage which Bologna has at its disposal. As the institution website states:

“Archeology, history, art, music, industrial heritage and technological culture are the major issues that are addressed, through both the individual locations and the thematic connections between them”(2).

The institution also offers to the general public guided tours, laboratories and thematic routes, as well as activities for schools and younger audience, such as animated tours and didactic games.

DIVING INTO THE PROJECT: LOCATION AND AUDIENCE

The main aim of our project is to arouse curiosity and to make the intricate museum configuration more easily accessible to the general public. In particular, we want to provide specific knowledge about the monuments, in order to stimulate and enhance the sensibility of the audience with respect to this incredible open-air museum. All of this has the purpose of making people aware of the importance of the cemetery and of stimulating their sense of care and responsibility.



Map of the Certosa museum by Zecchi
Image rights of Museo del Risorgimento di Bologna.

The situation of Certosa museum is extremely complex, in particular because of the fact that a great area of the museum has been dedicated to the municipal burial³. Consequently, we are clearly trying to operate on an important cultural heritage site but we must deal with the fact that it remains a cemetery and people who are coming to visit their lost beloved ones have the right to do that in peace, without being disturbed by unaware visitors of the museum.

Seen the frame, our project is composed by two different parts that will be translated into two main different paths of navigation inside our application⁴.

One of these has the aim to make people aware of the fact that they are visiting a museum that is also a cemetery, so this part of the experience will take place at home, with all the comfort and the time that the user deems necessary to live it. This first path will involve the dissemination of knowledge about the monuments and the general history of the museum, and will try to enhance the audience's interest and curiosity. It will also provide some knowledge about the place and about the many areas which it is composed of. This section will be made up of an interactive map, with a link to all the monuments and different presentation styles related to them. Additionally, we have thought also about integrating in this section a virtual 3D tour of the place.

³ Not without the great disappoint of the many who used to love the monumental cemetery at the time in which it has been extended. The disappointment is testified also by the image above by Zecchi, that writes "Pianta della Certosa di Bologna ora ridotta a Cimitero comunale" [Plan of the Certosa di Bologna now reduced to a municipal cemetery].

⁴ All the specifications will be explained in details in the Concept section.

The subsequent path, designed to be enjoyed after the first one, will be composed of an *in loco* experience with detailed explanations about some of the monuments and the people they are dedicated to, as well as the presentation of the different historical and artistic perspectives that characterize each of them.

This application has been conceived with a clear frame in our minds, we want it to be enjoyable from whoever cultivates interest in doing it,. For this reason, it has been thought starting from a general, but at the same time, precise idea of the target audience.

The CeRTo app is intended to be used by people with an age span that ranges from 16 to 55, such visitors are likely to be art curious or experts in the field, but they may also be simple tourists coming to the city of Bologna for a day or two (or more time), who want to enjoy the beauties of our city. Such information have been extracted throughout our multiple visits to the museum and also thanks to the different custodians to whom we have asked information regarding people who normally come to visit the monumental part of the museum. However, given that the visit is completely free, the individuation of our target audience is not based on statical analysis of data gathered for example from the profiling that is normally done during the purchase of tickets. Therefore, an important benefit that can come from using our application is the possibility to statistically analyze all the users and the way in which they interact with our software in order to improve marketing strategies for the Certosa.

Going back to the target audience, our application has been thought also for inhabitants of Bologna. In particular, it will also have a section to present all the events that directly (or indirectly) involves Certosa museum and that could possibly be enjoyed by locals and tourists. The application should be sponsored by different webpages somehow related to tourism in Bologna, or with city event promotion, and should be able to enhance the knowledge and sensibility about the many works of art and the history of the Certosa. Furthermore, it should be able to make users develop a sense of respect and care towards the role and the importance of the museum.

Personas

In order to give a precise idea of our target audience, we have decided to design four *personas*⁵. The fictional characters that we have created are meant to be representative of the different span of ages⁶ and of the different kind of backgrounds and interests that the visitors/users may have.

In the conceiving of these four personas we focused mainly on identifying the right audience that may take part in the more interactive path of the application, that is the *virtual experience tour*.

For each of these characters we have also outlined some challenges that we think we will face in developing the application and that can give us a way to designing it in a user oriented perspective.

In this section we will present each of our fictional characters:

⁵ We have intentionally avoided to identify people with physical difficulties in our target, this choice is motivated by the lack of some facilities in some areas of the museum for such visitors. It would be great to improve our application with a personalized tour for such audience.

⁶ Just to recall the fact that our application is meant to be used by people with an age that ranges from 16 to 55 years.

1. Asia P.

Asia P.
High school student

Technical Skills

| Skill | Percentage |
|---------------------------------------|------------|
| Ability to browse | 85% |
| Ability to interact with applications | 95%▼ |
| Ability to use smartphones | 96%▼ |

Key Attributes

- Gets easily bored
- Interested in learning new things
- A little disrespectful

Bio

Asia gets easily bored and is not so interested in arts and related fields. Nevertheless, she is always in search for inspirations and for this reason she tends to be informed about the events that take place in his hometown.

Challenges

Tempt her into following the entire virtual tour and arouse an empathic attitude.

Enhance a caring attitude with respect to cultural heritage sites.

Age: 17 years old
Location: Bologna
Platform: iPhone X

Asia is the classical teenager, not so interested in arts and she gets easily bored. Seeing the fact that she is quite a digital native, she is also pretty capable to make use of smartphones and applications and is in particular well informed on the different events promoted in her hometown.

Our goal, with Asia, is to be able to capture her attention and to tempt her into downloading and making use of our application. This is yet a pretty hard challenge but with the right marketing strategy is also pretty easy to let her download the app and start browsing inside it.

The second challenge is a bit more complex to be faced, but we are sure that once finished the tour and listened to the story that Brasa - the virtual guide - will tell her, she will come out from the experience a little bit changed and a little bit more aware of the importance to preserve Cultural Heritage sites, and the care and respect that they need in order to be preserved.

2. Claudio R.

The user profile for Claudio R. features a central circular portrait of a man with his hand to his forehead, looking thoughtful. Above the portrait, the name "Claudio R." is displayed in white, with "PHD student" written in pink below it. To the left of the portrait is a section titled "Technical Skills" with three progress bars at 100% completion. To the right is a "Bio" section with a bio icon and a "Challenges" section with a graduation cap icon.

Technical Skills

- Ability to browse
- Ability to interact with applications
- Ability to use smartphones

Key Attributes

- Extremely respectful of CH sites
- Passionated about CH and digital environments
- Lost all his hair by studying DHDK at UNIBO

Bio

He is a PHD students in "Cultural Heritage in the digital ecosystem". He is convinced to be a designer even if he develop virtual environments. Nevertheless, he is highly interested in cultural heritage sites and in art in general.

Challenges

Do not provide trivial information and let him finish the experience with an enriched knowledge about the site.

Claudio is our *perfect and ideal user*, he is extremely interested in Cultural Heritage topics and he is also a great experts in the art field, he would surely be a great enthusiast of our application and will immediately give it a chance. He is an independent and aware user of smartphones and he is at ease in the digital landscape.

Even in the case of Claudio we have thought about a possible challenge, we should be able to provide interesting information in order to capture his attention and to let him focus on our work, avoiding to bore him with trivial knowledge.

If our mission will be accomplished, he may become a sponsor of our project, talking about it with his friends and co-workers. Ideally, they will have quite similar interests to those of Claudio, and therefore it is aspic able that they will become future users of our application.

3. Friedrich G.

The user profile for Friedrich G. features a central circular icon of a man wearing a blue jacket and a hat, standing with hands on hips. Above the icon, his name "Friedrich G." is displayed in large white letters, with "Biologist" written below it in a smaller, stylized font. To the left of the profile, there's a section titled "Technical Skills" with three horizontal progress bars. The first bar for "Ability to browse" is at 65% (down from 70%), the second for "Ability to interact with applications" is at 60% (down from 70%), and the third for "Ability to use smartphones" is at 70% (down from 70%). Below this, under "Key Attributes", is a list of three items: "Extremely curious", "Always traveling", and "Interested in seeing beautiful natural places". To the right of the profile, there's a "Bio" section with a bio icon and a "Challenges" section with two challenge icons (handshake and location).

Friedrich G.
Biologist

Technical Skills

- Ability to browse ▼65%
- Ability to interact with applications ▼60%
- Ability to use smartphones ▼70%

Key Attributes

- Extremely curious
- Always traveling
- Interested in seeing beautiful natural places

Bio

Friedrich is a German biologist and his work gives him the chance to travel a lot. He's interested in seeing natural beauties and in enriching his knowledge about the places he travels to. He is not so passioned about artworks, but if there is the possibility to take part in a guided tour he always catch it up.

Challenges

Emotively engage him while he is discovering an incredible open air natural landscape.

Let him live a new experience to which he is not used and let him feel like he is taking part in a personal guided tour.

Friedrich is not exactly the first kind of user that we may attract - also because he is not one of the best smartphone users in the world - but, with a good promotion in websites and pages somehow related to events for tourists in Bologna, we should be able to get his attention and induce him to download the application and take part to the tour. He should be able to enjoy the open-air space of Certosa and, immersed in nature, he would live an extremely pleasant experience and also learn a lot about Italian art and history. We are sure that, also for Friedrich, the experience may help him to develop a sense of care and the attitude to respect and protect Cultural Heritage sites.

4. Sabrina C.

The character profile for Sabrina C. is divided into three main sections: Technical Skills, Key Attributes, and Bio.

Technical Skills

- Ability to browse: 85%
- Ability to interact with applications: 55%
- Ability to use smartphones: 75%

Key Attributes

- Extremely busy
- Always informed about the news of her city and its surroundings

Bio

Sabrina is an extremely busy doctor during the week, so in the weekend she likes to make some trips out of her town in order to relax and be emotively engaged by some beautiful places. She is always up to date for what regards new museums or activities in which she can take part.

Challenges

Entertain her with a new experience and arouse admiration for something that she may have not seen yet.

Develop a sense of care and a positive attitude, in order to encourage a peer to peer promotion of the experience.

Sabrina is the oldest of our characters but also one of the most interested in trying new things. In particular, she is really busy during the week thus, when she has some free time. She also likes to travel near her hometown and to take part in events and pleasant experiences to reduce all the stress accumulated during the week. So, what we want to do with Sabrina's tour is to make it relaxing, interesting and entertaining.

We have thought also about her in developing CeRTo, we would like to let her live a beautiful experience and to arouse in her a positive attitude. In this way, she will go back to work the week after with a beautiful memory and something to talk about with her colleagues and friends.

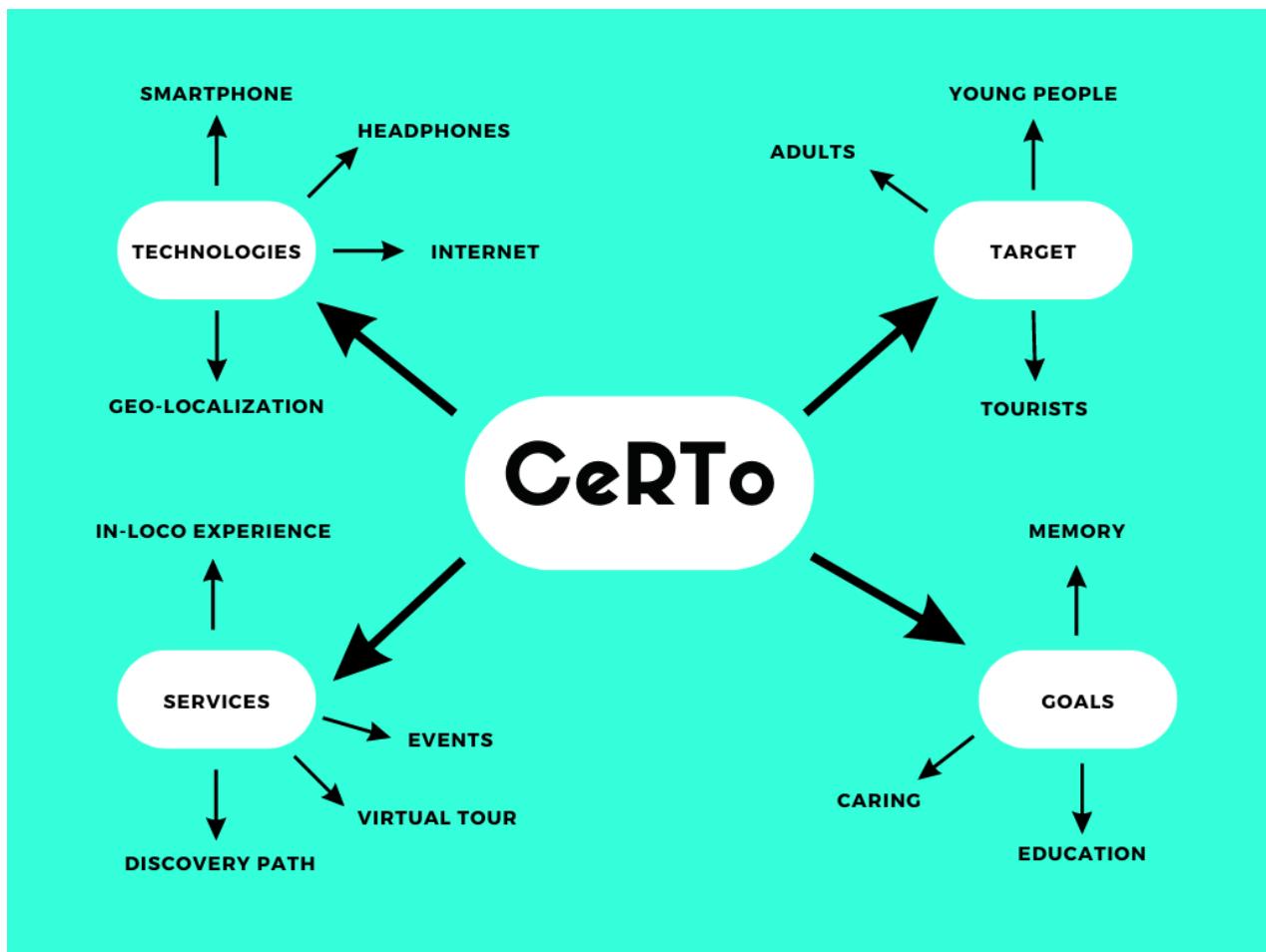
Moreover, given the fact that she lives not so far from Bologna, she could possibly be a great peer-to-peer sponsor for people who lives not too far from the site.

CONCEPT

CONCEPTUAL MAP

Once defined the exact location and identified the target in an accurate way, we have moved a step forward and worked to define a well structured design concept.

First of all, we have developed a conceptual map in order to characterize our project in terms of museological approach, user experience and goals.



CeRTo conceptual map

As you can see from the above map, we have tried to define the main services that the application aims at providing to its users. In particular we have decided to divide our software into 4 different sections, each one of these is needed to present a different perspective about Certosa.

First of all, just to recall what has been said before, our application will have two main services related to a sort of tour of the museum, these are the *in-loco* experience, enjoyable only inside the museum and thanks to the help of a virtual guide, and the *virtual tour*, that the users can rapidly access and enjoy from everywhere.

Moreover, we provide to the audience a discovery path in which they will be able to easily browse all the different monuments and sections of Certosa. Within this part, the users will have the possibility to learn many information about the history of the museum and of the specific elements in which they are interested. Such information will be provided together with images and accurate descriptions made available by experts in the field.

Finally, we have decided to provide also an additional service that will inform the user about events that directly (or indirectly) involves Certosa.

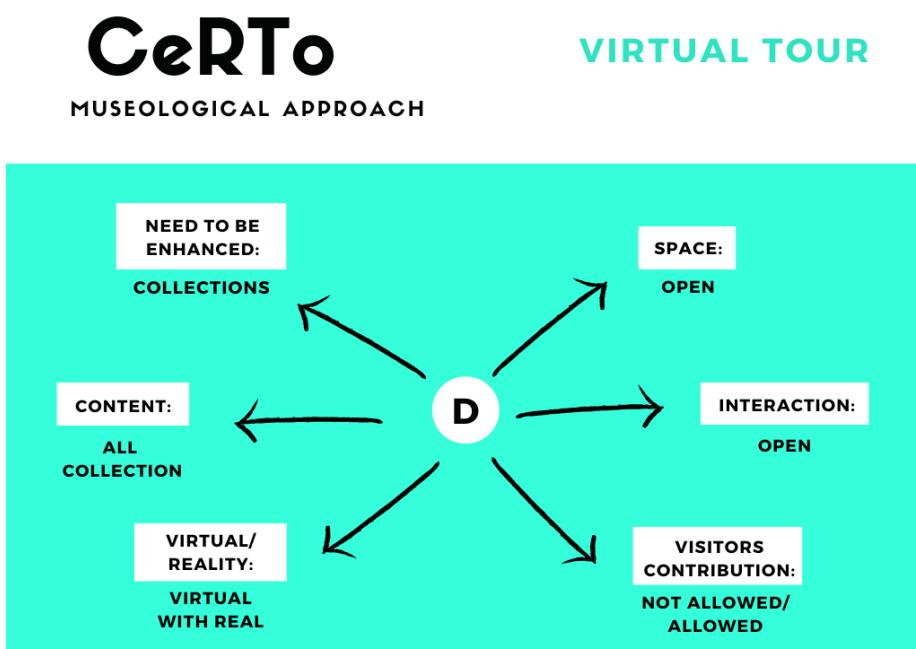
For what concerns the technologies, the only elements that will be needed⁷ are headphones and internet in order to enjoy the in-loco virtual experience. Obviously, for what is our idea of the application, the user will also need a geo-localization service in order to see in real time his position inside the museum and where he/she needs to go in order to go on with his visit.

Finally, seen that the target audience has yet been presented in details above, we only need to introduce our goals. These should be related to educational themes, in fact we want to inform our users, but also arouse more strictly cognitive sensations. What we intend to do is to enhance and, at the same time, arouse a specific sense of care for Cultural Heritage sites. Moreover, another important goal of our project is to "build a pleasant memory" in visitors who take part in the in-loco experience.

⁷ At least of which we are aware at this stage of the project.

MUSEOLOGICAL APPROACH AND CULTURAL HERITAGE TOPICS

Here, we want to focus strictly on the two main services offered to our users, that is to say the *Virtual Tour* and the *In-loco Experience*. According to the differences that exist between these two, they also have different communication needs, different methodologies to involve the user and to present objects and areas of the museum. From this perspective, also their classification in the taxonomy of virtual museums taken as reference taxonomy⁸ is clearly different.



Recap diagram - Virtual tour definition

Starting from the assumption that both our main services do not allow visitor's contributions, we can begin our investigation with the virtual tour.

To this end, we can say that it has been conceived to be enjoyed as an open interaction environment, so there are no constraints and the user is free to approach the interaction with the tour in the way he/she finds more useful and pleasant for him.

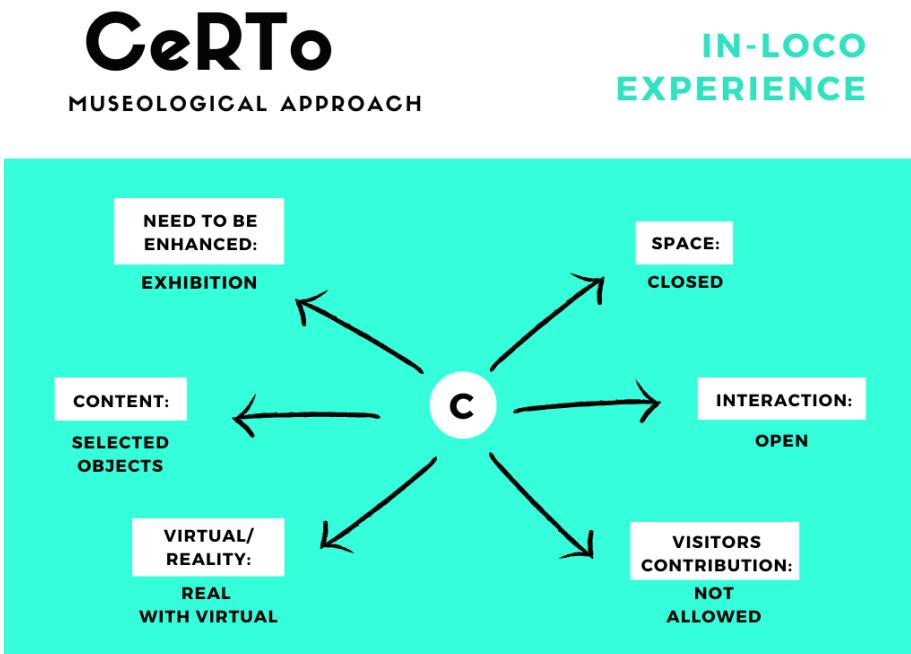
⁸ The reference taxonomy from which we are taking our frame is the one in (1B).

Moreover, the map is freely browsable and explorable in any way he/she prefers, so we can see that no strong pattern emerge⁹ from the space, thus also the space in which the interaction takes place can be considered open.

Inside the map, our users will be able to explore every monument, paint or relevant element of the museum, therefore we may say that the entirety of Certosa's collection is displayed and shown inside this service. The time the users have at their disposal is unlimited, they can open the app and learn something about one or two monuments and then close it to come back in it the following day.

Finally, our investigation has ended in the moment in which we have decided that the best way to approach a user who is not an expert is to digitalize the objects of Certosa in order to present them and make them easily browsable. To this aim we have conceived an idea of our tour that is perfectly coherent with an organization of virtual with real.

Seen all these elements, we are easily able to decide which is the key element of our tour, the Collection, therefore we can assign the virtual tour to the D category of the reference taxonomy.



Recap diagram - In loco experience

⁹ To be precise, no pattern at all.

For what concerns instead the In-loco Experience, we have started to think - by following the same pattern followed above - about the kind of interaction that takes place in it. We have conceived also in this case an open interaction, in particular because the kind of approach to the visit is again free, no constraints have been inserted in it.

Then, we have decided whether we wanted an open space or a close space, in that case we found more appropriate the emergence of a strong pattern for what regard the virtual guide showing you the monuments and sections of Certosa. In particular, seen that the user cannot be free to move inside the space and enjoy the same experience as if he/she was following the path, we opted for a closed space, also because of the limited time that we have at our disposal in the guided tour. Furthermore, seen the fact that there is a virtual guide who interacts with users, we needed to make a choice for what concerns the objects and elements to show. It was clearly impossible for us to include the whole collection, so we have decided to include only part of it.

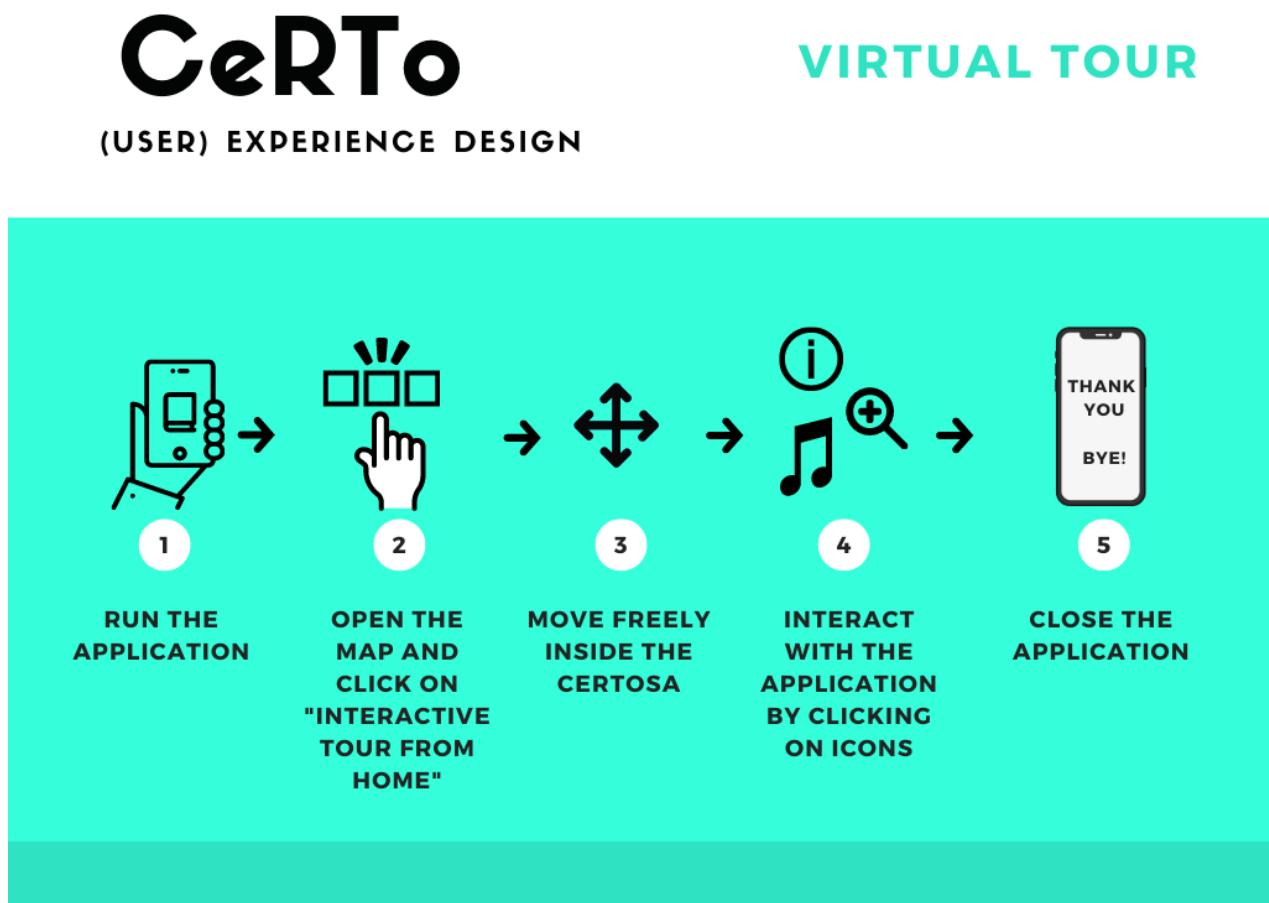
Finally, we have decided to let the users live the real experience of seeing the real objects, but with an explanation that comes from a virtual guide who also tells a story. What we have made use of have been a real with virtual approach, in order to mix real objects with interactive systems.

This investigation ends here, we know for sure that the key element of the experience we have designed is the Exhibition, the one that needs to be enhanced. We can easily assign this experience to the C category.

So, to recap the information given until this point, we have decided to assign **D category** to the Virtual Tour and **C category** to the in-loco experience.

EXPERIENCE DESIGN

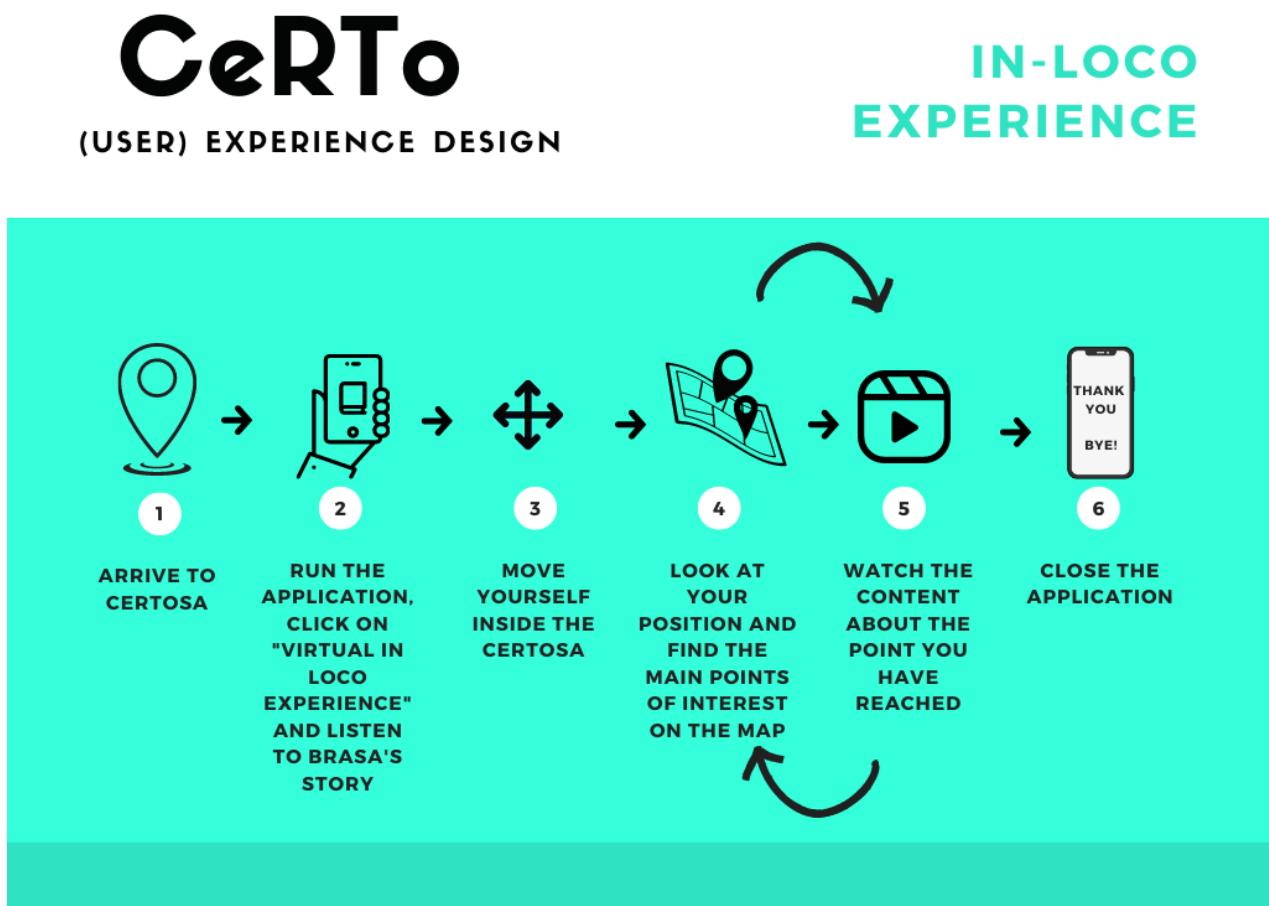
Inside CeRTo app, users will find two main kinds of experience to enjoy: one can be enjoyed everywhere and consists in a Virtual Tour of Certosa's map, while the second one is thought to be an in-loco experience in which users can follow a suggested path and listen to our virtual guide Brasa's story.



Virtual tour - Experience design

In order to access the virtual tour, the user has to run the application and select the virtual tour. He/she will choose where to start the visit from a built in map, that allows to access every single section, of the Certosa. Once selected the section, the user will be inside the Certosa and will be able to freely move through thanks to a virtual reconstruction of the ambients.

Along the way, he/she can encounter some icons that, if clicked, provide additional resources and information related to the context. The information provided can be of many different kinds, just to bring an example, the user may listen to someone who tells the history of the place, may see videos related to the place or even of objects related to a famous person from the past that rests in the cemetery, information about the statues, and external resources. Whenever he/she wants, the user can end the visit and close the application.



In loco experience - Experience design

The in-loco experience is organized as a guided tour of some of the most interesting and important monuments and halls of the museum.

Once the user arrives, he/she have to run the application and choose the “Interactive experience in loco” option. A different map will be displayed, this will contain two pieces of information: the real time geo-localization of the visitor inside the Certosa and also the location of the points that he has to reach in order to enjoy this visit thanks to Brasa.

Moreover, by reaching these point he will also advance in Brasa's narration and finally he will be able to understand which is the mystery to which he is referring. In this way, the visitor can be aware of the path he/she is following.

Once he/she arrives at the point that is presented on the map, Brasa will appear again and will tell to the user some information about the monument or the location, and will also continue to narrate his story.

COGNITIVE FOCUS

The cognitive focus of this project is on memory and recall, as well as on meaningfulness, emotions and empathy arousal.

Starting from the memory, that is to say, the retention of important information, we can say that our focus on this cognitive element came out because we think that this could be an extremely important point in order to unlock the possibility to develop new ways of approaching Cultural Heritage sites. To develop this new approach and make it last in time, a long lasting memory of an experience that aroused and enhanced inside the user a range of different emotions, somehow related to sense of care and respectful empathic behaviors, can be extremely important. This importance is also more evident when we face the recalling function through the embodiment sensations that have been lived by the user at the time in which he participated in the in-loco experience.

The in-loco experience, also thanks to his structured narrative, will help the visitor to keep in mind some basic and crucial information about the history of Certosa and its masterpieces. In particular, the slight, but at the same time extremely central to this aim, hierarchical structure of the narrative will help the user to build up a memory of the experience. Moreover, also the emotions and the feelings he had during the visit will contribute to the creation of an even stronger memory that may come back, from the sub-conscious layer, in many different situations, and promote in the user a better way to behave in relation to some particular events that may involve such memory in a direct or indirect way.

The tangible experience, lived inside the Certosa, will encourage and promote a sense of care and a respectful attitude throughout Cultural Heritage sites, this is our first aim.

GOALS

Seen that the application is thought to be used in different ways, depending on the place in which it is used, the different modalities will affect the kind of goals and the way in which they will be reached.

In general, the aesthetic pleasure, as well as the curiosity, that the application inspires are the principal elements that will capture the attention of our audience.

In the context of the remotely experienceable virtual tour, the main aim is to virtually convey a sense of wonder towards the Monumental Cemetery. In doing so, a potential user should be convinced to visit the site in person, deepening his/her knowledge about the Certosa with the help of the in-loco experience offered by the application. The virtual tour will also inspire curiosity in the audience by capturing the attention of the user towards the beauty of the place or sowing some information that may - still - motivate people to "physically visit" the cemetery. What implicitly underlies these two points is the aim of letting people know about the Certosa Monumental Cemetery and make them aware of the respect that a place like this deserves.

Providing contextual knowledge, as well as information related to specific sections of the graveyard and works of art, allow the application to fulfill its purpose: educate the user about the history of the place, giving at the same time a taste of what a real visit to Certosa museum would look like.

Once the Certosa has been reached, the nature of the objectives changes. The application must attract immediately the curiosity of the visitor, giving him/her a small amount of information, but trying to arouse a sort of emotional engagement. At the end of the in-loco tour, if the visitor wants to deepen his/her knowledge, he/she can study in deep the monuments and the sections that he wants thanks to the "Monument page" of the application.

During the in-loco tour, a meaningful experience can be shaped. This, will bring the visitor to build a new sense of care and of social cohesion, feeling part of a community and arousing or/and enhancing his/her empathy.

Thanks to the application, the Certosa should receive more visits from new demographics - such as teenagers or casual tourists - that have been attracted by the app, but didn't know or weren't interested in the beautiful treasures of the Certosa.

The CeRTo application is also intended to bring more online visits to the informational sites of the different institution that manages and diffuse information about the Certosa - the different websites that publish the events held at the Certosa - and to increase visitor's satisfaction, by giving them a way to orient themselves inside the Monumental Cemetery and a background knowledge that will make it easier to learn more after the experience.

What the application aims to do is informing the visitors about the main artworks and points of interest throughout the whole museum. However, not only the content but also the Monumental Cemetery itself is of great importance. Disseminating knowledge about the site is decisive in order to address the purpose of combining the physical perception of the gargantuan dimensions of the Certosa with the essence of its historical magnitude. Thus, the goal of enhancing the comprehension of the visitor about the importance of the place and the objects it contains can be reached.

In general, what can be thought of as the common denominator of the application in this context is to enable a potential user to experience the Monumental Cemetery not only as someone interested in the "atmosphere" only. The application aims at combining the sensorial experience provided by the tangible heritage in the real museum with the information that would be necessary to reach a deeper perception of what Certosa is. It aspires to suggest a meaningful path inside the graveyard so that the user may be engaged in discovering the most marvelous landmarks. In doing so, the purpose is also to make the user learn something that could enhance his/her perception of the connections between the Certosa, the city of Bologna, and the time that bonds them together, making him/her develop a strong sense of care.

REQUIREMENTS

In identifying and defining the requirements, it has been considered as crucial to include both “functional requirements” (what the application needs in order to reach its objectives) and “quality requirements” (what quality the application should have to be considered effective).

In order to provide a better understanding of the importance of the requirements, they have been divided into four categories: “must” (what is fundamental for the success), “should” (what has a high priority and is essential if perfect time and budget conditions occur), “could” (what is desirable but not strictly necessary) and “won’t” (what is agreed not to be developed in the final project).

Must

In order to consider the application effective, the user, once in the Certosa, must be able to reach a deeper knowledge of the Monumental Cemetery and to appreciate its historical and artistic heritage without feeling that the real visit is obstructed by the use of the application. Therefore, the application must be easily accessible and usable, as well as not invasive. Its interface must be simple and the informational output clear, unambiguous and clearly understandable by people having different backgrounds. The need for clear information and usable interface is naturally related also to the virtual tour. It is clear that the virtual experience must be so easy to use that the user has to feel no difficulty at all in understanding how the application functions.

Should

An effective application that deals with geo-localization should ensure an efficacious system for the user orientation during the visit. The user should have clear in mind where he/she is, and the design of the interface should provide a reliable way to unambiguously tell this information also by choosing the most appropriate icons. The application, for the same reason, should be able to constantly refresh the content and to keep the user up to date with his/her position inside the site. Having a crystalline perception of the self-position within the environment is also fundamental for the virtual experience.

This service should make the user feel comfortable in moving around without any trouble and effort, but also furnishing a clear method to let him/her be sure about his/her location and movement possibilities. Moreover, the virtual experience should be able to reproduce in a perfect way the environment and the landmarks of the cemetery. In this way, it should involve the user to let him/her imagine how it would be to be physically in front of that specific object.

Could

The application has a meaning only if it could provide reliable information about the Certosa and its heritage. Naturally, a visitor can use the application in order to be guided through the cemetery so to reach the main landmarks. The application could provide different informational contents and different paths on the basis of what the visitor wants to achieve. It could be possible to choose amongst different levels of acknowledgement, hence, users with different time, interests, and background knowledge could approach the most suitable tour to learn something according to their specific degree of curiosity. For what concerns the application when it is used for the virtual tour, the information related to the works of art could be conveyed in such way that it would be clearly understood by different audiences. Moreover, it could be presented at different levels: one introductory that could highlight the main characteristics of the point of interest, and one that allow the user to dive a bit more into the informational content.

Won't

The user experience, given the objectives of the project, will be relegated to the exploration of the environment, both remotely and on site. Therefore, the application will not require the development of specific sections dedicated to the direct contribution of the users and will not provide the user with the possibility to open a conversation with the institution in charge of preserving the site.

DEVELOPMENT

STORY

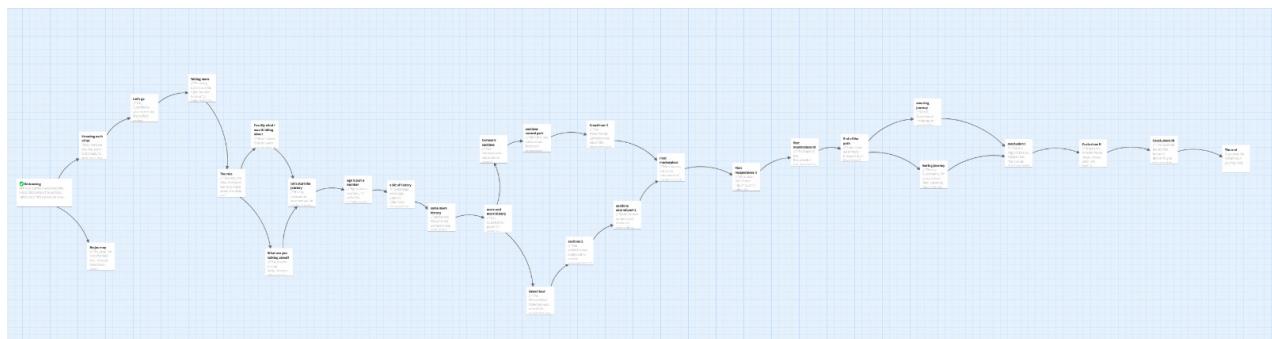
A nice old man welcomes the visitor that enters the Certosa and offers to guide him inside the place. It promises to be quiet and to help him/her whenever him/her wants.

The man illustrates some of the main places and works of art adding pieces of history about the Certosa and about himself.

Before the end of the tour the visitor will find out that that man is an old caretaker of the Certosa, that cares a lot about the place. He is now dead and wants to leave his memory, as well as the care of Certosa to future generations.

The narration has been organized according to a hierarchical structure as follows:

- There are two key moments, the start and the ending that are the same for each user.
- Each point of interest will have an information part. Points of interest are of two main kinds:
 - Sections: the visitor enters a new section of the Certosa, and information will be provided about the history of that specific section;
 - Items: statues, paintings, memorials of famous people, all the selected works of art to which the application will provide information.
- For each part the user can interact each time with the guide, which will make him/her little questions that changes every time according to the topic.

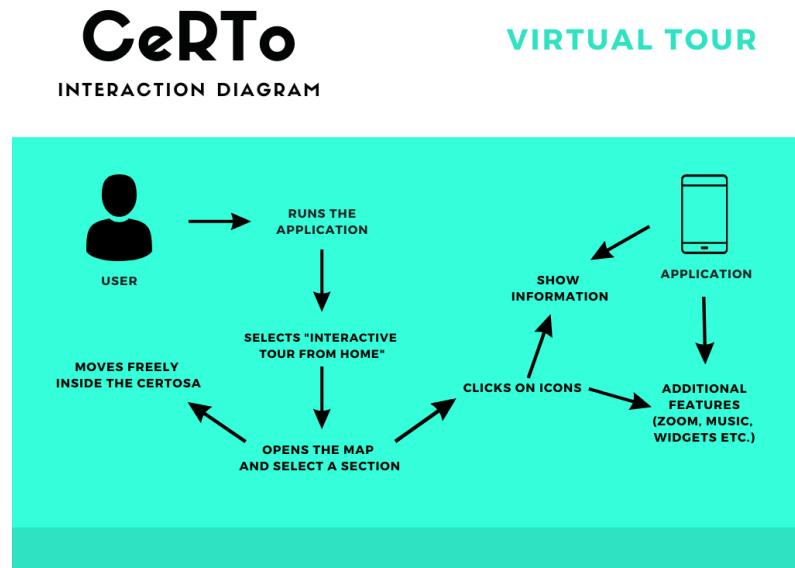


Story prototype on Twine

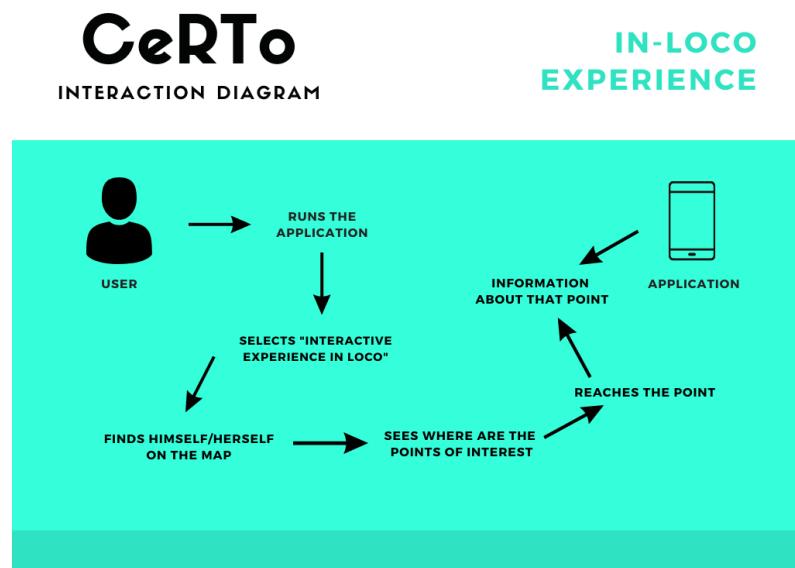
INTERACTION BETWEEN USER AND PROJECT

The user will interact with the application in two different ways, according to the modality he/she has chosen.

If he/she is in the virtual tour modality, he/she will move inside the Certosa and click on icons that will show different kinds of content.



If he/she is in the in-site visit modality, he/she will move freely inside the real Certosa and will follow the guided tour, receiving specific information according to the points that he/she reaches.



DEVELOPMENT TO REACH THE COGNITIVE FOCUS

In order to reach the cognitive focus, i.e., to enhance the memory and the possibility of recalling the experience and the knowledge acquired during it, the application uses a hierarchical narration.

"It seems we are not able to understand the past without media versions of it, and the last century, in particular, shows us that media and events of historical significance are inseparable".

(Hansen, 2011, pag.1)



Brasa

The cognitive focus will be developed through the narration during the in-loco visit.

The custodian will explain every part of the Certosa as a place he lived in for a long time and that he knows more from experience than from studies. This is the first level of memory and is aimed at empathizing with the visitor, making he/she feel part of the history.

A further level is about the habit-memory.

Each explanation block will use *multimodality* in order to recall visitors' own memories. In this way it will be easier for them to connect the experience to previous memories they already have and, in this way, they will easily remember the content of the explanations. The recalling will be performed using broadening famous works, for example, background music, a poem by Carducci, etc...

The last level to increment memory will be to construct authentic memories during the visit. This will be possible through emotions.

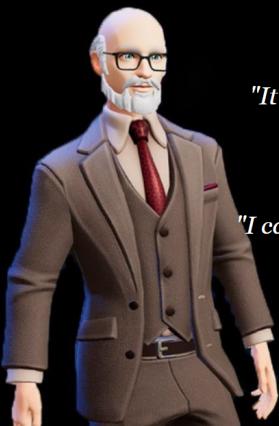
"When you remember something painful or nostalgic, you sense it, and it sometimes evokes a physical reaction.

A scent, a sound, a texture all trigger memories as images and narratives in your mind that you re-experience, visualize, narrativize and feel.

So, locating memory in the brain has to take account of both mental and bodily processes as a starting point, before incorporating non-scientific understandings."

(Hansen, 2011, pag. 15)

By making the history narrated by the custodian, the visitor will empathize with him and at a certain point will feel a connection to his feelings, embodying the experience and constructing strong and long lasting memories.



A nice old man welcomes the visitor that enters the Certosa.

"It's a pleasure to welcome you to this marvellous place. I know a lot of things about it, and if you want I can let you experience a memorable journey!"

"I can tell you a lot of secrets about this place, would you like me to be your guide?"

Yes!
 No, thanks.

Storyline prototype in Twine.

FORESEEN WORKFLOW

In this section we will present all the softwares and the professionals that may be needed, according to our analysis, in order to build up this project in a concrete way.

Professionals

The identified professionals for the development of the CeRTo app are:

- A service designer
- A software developer
- A marketing specialist
- A user experience designer
- An art and history expert
- A 3D modeler

These professionals will work individually and in groups for building and designing the different aspects of the application.

The service designer and the art and history expert will help all the figures along with the entire project, in order to make sure that it will be usable and each time in accordance to the specific historical period. The art and history expert will check also the correctness of the information provided.

The software developer and the user experience designer will develop the application. Those roles can be covered by a single person if he/she has the skills of both.

The 3D modeler will work on the development of the character that will guide the visitor during the in-site visit.

The marketing specialist will ensure the circulation and promotion of the art since its first release.

Softwares

The software that will be needed are:

- Figma: for the development of the application
- Pano2VR: for the development of the virtual tour
- PTGui: for the creation of panoramas

In order to complete the development of the application, it will be necessary to use also 3D modeler softwares.

CeRTo

FORESEEN WORKFLOW

SOFTWARES
HARDWARES
PROFESSIONALS

PROFESSIONALS:



SERVICE
DESIGNER



MARKETING
SPECIALIST



ART AND
HISTORY
EXPERTS



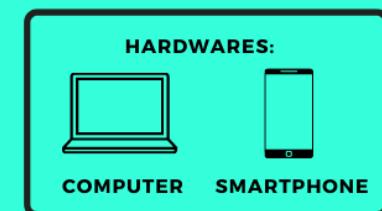
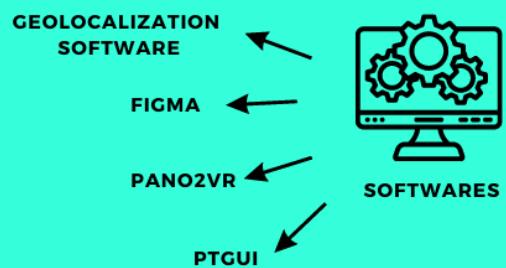
USER-
EXPERIENCE
DESIGNER



SOFTWARE
DEVELOPER



3D MODELIST



FURTHER DEVELOPMENT AND MAINTENANCE

Further Development

The CeRTo app will be constantly updated with new information about the events taking place at the Certosa.

Since there are always more discoveries in the art and historical field, the visitor tour will be updated every time new information about the works of art comes out.

The application could also implement image recognition during the in-site visit. This won't change the in-site visit experience but will make it easier for the visitor that will just focus on the work of art located on the map with his/her phone to play the information part.

A possible further development can be a virtual reality experience based on the in-loco tour that can provide the same experience out from the Certosa, spreading the notoriety of this holy and enchanting place.

Moreover, as said also at the beginning, a very important addition that could possibly be included in our app is a personalized path for users and people with physical difficulties. All of these obviously must be done with the help of the institution.

Maintenance

The CeRTo app will need constant maintenance.

For this purpose, at the end of the in-visit experience will be provided a questionnaire in order to be more conscious of the quality of the experience. A first update will be done as soon as enough questionnaires will be collected: in this way it will be possible to fix unnoticed bugs and improve the experience.

According to the questionnaires, if user preferences change over time, the app will be updated with new modalities of interaction.

Furthermore, if in the meanwhile new practices will be discovered for the development of the apps, the CeRTo will be updated accordingly. Those checks will be done each six months.

TEAM ROLES



Paolini Lorenzo

We worked synergistically, thinking carefully about every step and every possible solution to the problems that rose during our designing sessions.

Each of us was in charge of the production of a different prototype by using the specific software programs meant for that activity.

In particular, **Figma** was used by Lorenzo Paolini in order to design the application interface. **Pano2VR** and **PTGui** have been used by Bianca La Manna in order to build panoramas and the prototype of the virtual tour, and **Twine** was used by Tommaso Battisti in order to create the storyline that underlies the use of the application for the in loco experience.

Moreover, we have used **Canvas**, **VisMe** and **ReadyPlayerMe** to design, respectively, the conceptual maps, the profile of our personas and the different avatars.



La Manna Bianca

Before starting, we went many times to the Certosa in order to better understand what could be suitable for such a delicate place, to gather information about our potential target, and to shoot some photos for our panoramas.



Battisti Tommaso

The background story of Brasa has also been thought by the members of the group in order to create more empathy and to make the experience more interactive.

Sitography

- (1) <https://www.storiaememoriadibologna.it/certosa-monumental-cemetery>
- (2) <http://www.museibologna.it>
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Bibliography

- (1B) Caraceni, S.: "*Designing a taxonomy for virtual museums for the use of AVICOMM professionals*", Plymouth: Plymouth University, 2015.
- (2B) Montello, Daniel R.: "*Spatial cognition and architectural space: Research perspectives.*", Architectural Design 84.5 (2014): 74-79.
- (3B) Pescarin, S., Fanini, B., Ferdani, D., Mifsud, K., & Hamilton, A.: "*Optimising Environmental Educational Narrative Videogames: The Case of 'A Night in the Forum'*", Journal on Computing and Cultural Heritage 2020, 13(4), 1-23.
- (4B) Griffiths, M.D: "*Adolescent social networking: How do social media operators facilitate habitual use?*", 2018.
- (5B) Garde-Hansen, J.: "*Media and Memory.*", Edinburgh University Press. 2011
- (6B) Thorndyke, P.W.: "*Cognitive Structures in Comprehension and Memory of Narrative Discourse*" 1977