

School of Arts and Communication  
Interaction Design Master Thesis  
Malmö University



# MEMORIE

SUPPORTING THE PRACTICES OF MEMORY IN THE GRAVEYARD

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## ABSTRACT

**KEYWORDS:** interaction design, graveyard, memory, place, humanistic geography, burial practices, audio interaction, seashell

**TITLE:** Memorie, supporting the practices of memory in the graveyard

**CONTENT:** Due to its sensitive nature, the graveyard is often an avoided problem space within the field of design. This becomes evident from the lack of exploration and analysis in this domain. Anyhow, it represents an opportunity to test how design can mediate between sacred places, technology and people. Moreover, as a very specific context, the graveyard encompasses peculiar ways of interacting and experiencing space that deserve to be taken into account.

This work discusses the notions of space and place and how the field of interaction design can benefit from them. In doing so, it investigates the hidden dimensions of the graveyard that make it a complex structure where spatial, personal and socio-cultural dimensions are intertwined.

While the fieldwork aims at analysing the graveyard in its different tones of meaning (identity, memorial, cultural differences, on-site interaction) the focus of the work are the practices of memory and the role that the past has in our relation with the deceased.

The result of the design process is an interactive audio system composed of a playback circuit based on Arduino and boxed into a seashell. The device is designed to be placed on the grave and store audio content. Once activated, the audio seashell allows listening and eventually recording vocal traces related to the deceased's past. Taking into account the observed practices, rules and conventions that shape the graveyard, the role of personal and collective rituals and the meanings of all the identified artifacts, the designed system supports the experience of recalling memories in respect to the atmosphere, tempo and rhythm that characterise the graveyard.

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# 1 RESEARCH AREA AND RESEARCH QUESTION

This thesis in interaction design discusses and explores the domain of the graveyard as a complex structure in which people interact at physical, personal and socio-cultural level. The subject area for this thesis is thus the graveyard considered as place and the related practices and interactions that can be supported by digital technologies.

This work will analyse and discuss place and experience as useful concepts for the design of interactions in the physical environment. In doing so, it will focus on issues concerning the on-site physical interaction in the graveyard and the practices related to the domain of memory. The final aim of the thesis is discussing and developing an interactive system able to support and enhance the experience of the graveyard and trigger the reflection upon our relation with the deceased.

## **1.1 AIMS OF RESEARCH**

In this work I want to explore the possibility of supporting and enhancing the experiential dimension of the practices and interactions in the context of the graveyard. In doing so, I will discuss the issues concerning how interaction design can contribute and at the same time respect the established conventions and rules related to this specific set of contexts and situations. I would add that my aim is to look for a solution that will be practical but also capable of communicating a message and stimulating reflections upon our relation with the graveyard.

Being able to know more about the deceased and contribute to the construction of her identity through memories, as well as to the possibility of sharing this knowledge in terms of experience, is what this work is supposed to achieve. My approach to the graveyard is based on the humanistic school of geography and follows the path traced by Ciolfi in her PhD thesis (Ciolfi, 2004), which will be discussed in the following paragraphs.

In the end, my aim is developing a prototype of an interactive system that will represent my contribution to the problem of designing digital solution within non-flexible and convention-driven spaces like graveyards.

In the next sections I will discuss the graveyard as a place and the richness that an experiential approach to space can offer to the design process.

## **1.2 PLACE, EXPERIENCE AND GRAVEYARD**

In these paragraphs I will explore the notions of place and experience articulating them in relation to the domain of the graveyard. This discussion is due because of the particular physical environment and the culturally and socially developed ways of experiencing it. Going beyond the physical setting of the graveyard allows me to consider the entire set of practices related to it. In fact, as a space where physical, personal and socio-cultural traces pile up, the graveyard can be considered as lived space.

Another important reason to consider the notion of place is its connection with the concept of experience and with people's role in affecting the spaces they inhabit. As a domain that cannot be considered functional or just task-

oriented, the graveyard is a place where experience plays an important role within the interactions.

Before any insights in the features of the graveyard, I will explore the notion of place and the studies that have contributed to make this approach useful for interaction design.

### 1.3 ARTICULATING THE EXPERIENCE OF SPACE

The discussion upon space and place belongs to a wide literature. Here I will explore the most important landmarks that led to the approach of Humanistic Geography, which is one of the most interesting from an interaction design perspective.

A good starting point when talking about place is the work done by Bachelard. He explored the relations between spaces and psychological processes, with a particular interest in the role of emotions (Bachelard, 1958). His vision of space takes into account the emotional dimension of one's experience of an environment, mainly the intimate spaces of the home, analysing how a space can trigger emotional and cognitive responses. His idea of *Localised Experience* (Bachelard, 1958) recognises the role of emotions and memories as essential features to the experience of a physical environment.

Another fundamental contribution to the consideration of the notion of place has come from the philosophical approach called Phenomenology. I will take into account the representative that showed particular interest into the lived dimension of space: Merleau-Ponty. This philosopher had a really clear view on what is a place and what makes it different from space (Merleau-Ponty, 1954). He used the terms *geometrical* and *anthropological space* to articulate the reasoning. A geometrical space is the set of lines and shapes. It is what you see on *GoogleMaps*: a clear map<sup>1</sup> of the physical context. What is missing then? Merleau-Ponty argued that the concept of *anthropological space* encompasses something more: the *lived dimension*. According to Harrison and Dourish space connotes physical elements and

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<sup>1</sup> De Certeau describes the *tour* as an everyday narration of movement and opposes it to the *map*, "a scientific representation that erases the itineraries that produced it.

place human experience: “We are located in space, but we act in place” (Harrison & Dourish, 1996:69). Living a space creates experience and gradually generates *placeness*<sup>2</sup>. As a student, often I often of the different rooms, apartments and cities I have been living in. And it is quite obvious to say that feeling a space as your room takes time. But if in the beginning it is just a space with a bed, a closet and a desk, after a while it becomes part of you, your place. De Certeau used this example to explain and describe his idea of place. With a different use of the terms<sup>3</sup>, de Certeau clearly explains the idea of inhabiting a rented space and gradually transforming, through practices, into place (de Certeau, 1984). Anyhow, the time needed to feel a space, as yours does not imply that the sense of place is an either-or: it is a property of a physical environment that can be gradually achieved. In this sense, places can differ from each other. The consideration of museums as places (Ciolfi, 2004) is a good example of how the different degrees of placeness. In fact, even a temporary space as a museum has its degree of placeness if we take into account the practices, the conventions and the experiences generated by the interactions people have within its physical boundaries.

#### 1.4 THE HUMANISTIC SCHOOL OF GEOGRAPHY

More recently, a very interesting stimulus to the studies of experiencing a space has come from the field of Humanistic Geography. As the name states, it concentrates not only on the notion of place but on people as well<sup>4</sup>. Humanistic Geography is the result of a cultural turn that affected the scientific field in the last years. Breaking with the traditional geographic approach, concerned with spatial models and predictive patterns of space, the humanistic geographers take into account Philosophy, Sociology and

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<sup>2</sup> The sense of place

<sup>3</sup> For de Certeau, "space is a practiced place." (de Certeau, 1984:117). He seems to reverse the usage of the terms: one might expect him to describe place as practiced space.

<sup>4</sup> The principal goal of Geography is "to understand the Earth as the world of Man" (J.O.M. Broek, 1965). See <http://geography.about.com/index.htm?terms=geography>

Anthropology and try to develop a more complete and not merely statistical understanding of the phenomena:

"Humanistic Geography looks at environment and sees place – that is, a series of locales in which people find themselves, live, have experiences, interpret, understand, and find meaning" (Peet, 1998: 48).

The first concern of this approach is the understanding of individuals and their experience of the world and of the process according to which a space becomes place. Crang states that the main philosophical influences on Humanistic Geography can be summarised with the pioneering work done by Husserl, the exploration of the emotional dimensions of a place conducted by Bachelard, and the crucial shift Heidegger made towards the importance of the bodily component (Crang, 1998).

Husserl has been the real founder of the phenomenological approach. He wanted to bring mathematics closer to the real world and to the experiential dimension. His theory of *intentionality*<sup>5</sup>, derived from Brentano's, takes into account the relation between human actor and object. The importance of his studies results in the consideration that "places are not just a set of accumulated data, but involve human *intentions* as well" (Ciolfi, 2004:55)

As stated before, Bachelard's contribution opened the way to the reflections upon the emotional and not only physical dimensions of a space. Anyhow, this feeling was already present in Husserl. In fact, he borrows the idea of *essences*, the set of features that characterizes an object. Relph brought it even further with the concept of uniqueness of a place and the notion of *genius loci* (Relph, 1976).

The third strong influence on Humanistic Geography came from Heidegger and the existentialists. Heidegger totally broke with the previous Husserlian phenomenology, still based on the Cartesian dualism and then on the separation between mind and body. According to him, body is preeminent

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<sup>5</sup> "Intentionality describes the relationship between the trees outside my window and my thinking about it; for Brentano, all mental states have this property of being about something". (Dourish, 2001,105)

and necessary to have experience of a world that is already meaningfully organised. Heidegger does not agree with the concept that we have to attribute meaning to the world: the reality is already meaningful and through our body and our action in the world we can interpret those meanings<sup>6</sup>.

The Humanistic Geography is interesting to this work also because of the methods it adopts. In fact, it refuses any quantitative and statistic methods of investigation:

"Humanistic Geography treats the person as an individual constantly interacting with the environment and changing both self and milieu. It seeks to understand that interaction by studying it as it is represented by the individual and not as an example of some scientifically-defined model of behaviour" (Johnston, 1981: 187)

Humanistic Geographers aim at understanding the sense of place by analysing the different constitutional dimensions of it. This implies the adoption of qualitative methods of investigation, in order to conduct an “experiential field work” (Rowles, 1978), and a concern for a holistic analysis of the place that is considering the object of the investigation as an unbreakable whole of interlinked features. The critique to quantitative geographical approaches is justified by the goal of avoiding generalizations and traditional measurement: “[...] focusing on the experiential nature of space and place, going beyond the analysis of geometric and structural features, can assist interaction designers to understand interaction dynamics, and to propose effective design concepts”<sup>7</sup>. (Ciolfi, 2004: 19)

## 1.5 CONSTITUTIONAL DIMENSIONS OF PLACE

The studies conducted by Yi-Fu Tuan, probably the most influent humanistic geographer, are all oriented to the understanding and the clarification of what place is and of the meanings it might assume. The

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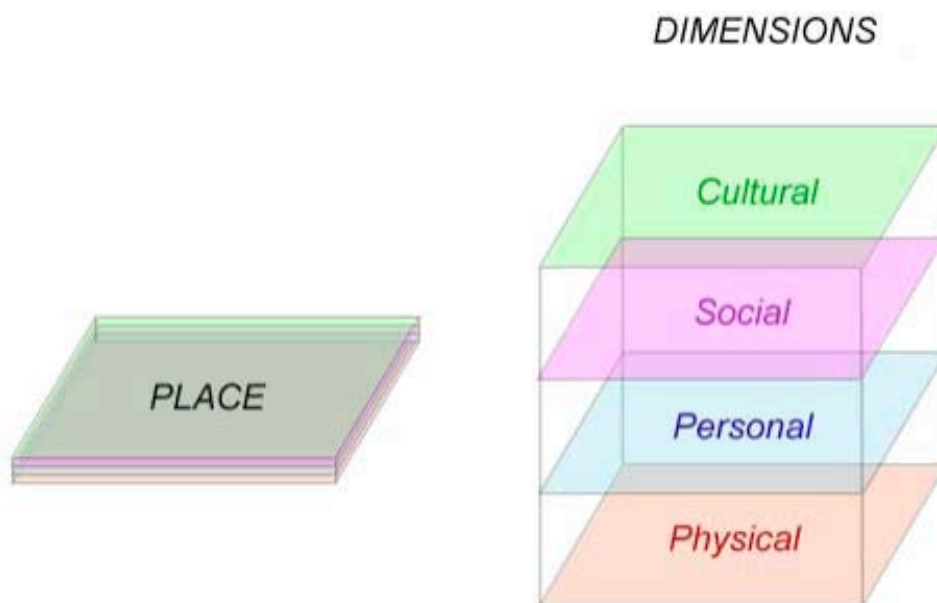
<sup>6</sup> His approach is often called *hermeneutic* phenomenology because of the interpretation needed to extract the meaning from the world

<sup>7</sup> The work of L. Ciolfi (2004) has introduced within the Interaction Design field geographical notions of space and place, in order to enhance the design and development of novel interactive environments in the physical world.

centrality Tuan gives to the role of the experience makes his account useful and rich of cues for the Interaction Design field (Ciolfi, 2004: 70):

“[...] *it* shows how this notion of place can help Interaction Design for interactive spaces: it brings aspects of individual traits and preferences, social interaction, cultural influences together with the physical features of the space. Also this notion of place is oriented to individual experience, so to one’s actions and activities that occur within an environment”. (Ciolfi L., 2004)

Tuan states that there is place only when there is experience. He refuses the possibility of talking about place if the space has not been experienced by people: “places are centres of felt value” (Tuan, 1977: 4). This value originates from the experience we have in space through interactions. A place is like a sponge that absorbs people’s experience at different levels, from the physical features of the locale to the individual ones, passing through the social and cultural dimensions. Ciolfi (Ciolfi, 2004) provides a clear overview of Tuan’s account and a good representation of the dimensions that constitute a place.



**Fig.1** The constitutional dimensions of place (Ciolfi, 2004)

More analytically, Tuan considers place as constituted by four interconnected layers that, through the interaction people have with them, form the experience of a place:

- *Physical*: the physical features of the locale necessary for the constitution of the space. This layer is the geometrical space of lines and space introduced by Merleau-Ponty. The fact that the prime feature of human experience is in its sensuousness underscores the strong influence of the notion of *embodiment*<sup>8</sup>;
- *Personal*: this layer is related to the memories and emotions the place evokes. Obviously, this is very subjective and individual;
- *Social*: the social interactions and, mainly, the communication and resource sharing. This layer is about interpersonal relationships and social exchanges of all sorts;
- *Cultural*: conventions and rules established by the community but also the cultural identity of the place and of its inhabitants.

This breakdown is almost similar to the one of the four layers in which the interaction can be divided<sup>9</sup>. In some extent, this correspondence confirms the connection between Tuan's account and interaction design.

The layers identified by Tuan are strongly interconnected: every dimension exists thanks to the other ones. In their combination with human activities they make every experience unique.

## 1.6 TIME AND PLACENESS

My interest in Tuan's account originates not only from the analysis of the constitutional dimensions of place but also from the interesting

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<sup>8</sup> The notion of embodiment is relevant for Humanistic Geographers because it identifies the relationship between the way in which humans experience space and place and their physical presence within the world.

<sup>9</sup> Senso-motor, cognitive, socio-collaborative and emotional (Giovannella, 2005)

considerations upon the relation between place and time<sup>10</sup>. In its relation with time, place can be considered as a pause: “a particular occurrence within time seen as motion” (Ciolfi, 2004). I partially disagree with the idea of having a flow of time paused by the places we have experience of: in this perspective, time would flow only when we are in space<sup>11</sup>. As Casey notes, “places gather things [...], experiences and histories, even languages and thoughts”. As centre of felt value, the idea of gathering really works. But Casey goes on:

“Think only what it means to go back to a place you know, finding it full of memories and expectations, old things and new things, the familiar and the strange, and more besides” (Casey, 1996: 24).

These words summarise quite well the stance that humanistic geography has towards placeness and experience and this is the one that interaction design should assume as well (Ciolfi, 2004).

The role of time in the process of place-making is not so obvious. Apparently, the more time we spend in a space, the more we should feel attached to it. But this can be easily contradicted by temporary public spaces, which hardly becomes place, since they are essentially not designed for that. As Harrison and Dourish state:

“Placeness is created and sustained by patterns of use; it’s not something we can design in. On the other hand, placeness is what we want to support; we can design for it.” (Harrison and Dourish, 1996: 70).

Even if placeness cannot be designed, it can be supported and sustained by the design. One of the most famous examples of non-place is the airport<sup>12</sup>. This problem results from the type of place we are considering and from how it has been designed. First of all, as a temporary place, the airport is a

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<sup>10</sup> Bergson argues that the time is a sequence of qualitative states of the mind that are strictly connected (Bergson, 1965)

<sup>11</sup> The idea of place as pause in time reminds Barthes and his approach to Photography (Barthes, 1980).

<sup>12</sup> The notion of non-placeness has been introduced by Augé (Augé, 1995)

space that people inhabit only to do something else. Being temporary is a consequence of the extremely functional use people make of it. Moreover, the design of most airports is intended to support the way people inhabit it: short stay and quick movements.

This theme is important since this thesis argues that the graveyard has its own placeness. At a first look, a graveyard is temporary space as well. But the main difference is it is a set of personal spaces. Every grave can be considered a very personal space where people attach memories, for instance through a symbol or memento. A second difference is that a graveyard has thick cultural and social dimensions that are strongly rooted in the past of the traditions, history and beliefs. On the other hand, an airport has a lot of rules and social laws of behaviour but we cannot say that these are strong enough to be considered constitutive of placeness.

The relation between time and place can also reveal the role of memorial that place often takes when time is made visible and perceivable. Graveyards assume this function by showing time in different ways. Some of them are conventional (date on the headstone), others culturally determined (religious symbols) or even personal and arbitrary. Ciolfi notes that “this is an interesting aspect of museums: museums consist wholly of displaced objects but they create a new structure of objects into place, new places” (Ciolfi, 2004:64). Since we could consider every grave as place, I would add that we could talk of places also in the case of graveyards.

## 1.7 METHODS AND DESIGN PROCESS

In the previous sections, I've outlined the Humanistic Geography approach whose focus is on the notion of place using an experiential perspective for the analysis of its dimensions. This 'experiential field work' as Rowles calls it, refuses any sort of 'measurements' with which we mean quantitative and statistic methods. This originates from the will for a more holistic understanding of the sense of a place and of people who more or less temporarily inhabit it. Focusing on the experiential nature of these phenomena means, from an interaction design perspective, pointing the attention not just on the physicality of the environment but also on the activities that are going to happen in the considered space.

The stimulus generated by Rowles can be translated not only in the choice of qualitative methods of investigation and analysis but of a whole design process that is qualitative oriented. In this paragraph, I will illustrate the design process in all its phases together with the methods used for the research and design activities.

The design process of this work starts with a **domain analysis** that aims at exploring the problem area and the possible design directions. This is an investigation that basically gives a preliminary knowledge of the area and of the previous works. The goal of this phase is to get acquaintance with the domain, its logics and boundaries. The method used during this analysis has been ethnographic research (Blomberg, 1993) conducted through field observations and semi-structured stakeholder interviews. This phase has also been enriched by research through the web.

Annotations and pictures have been the main material produced as well as a sketchbook of things I've found inspirational. Identifying different areas where this work could intervene has generated different scenarios that aimed to trigger the imagination with some known constraints and limitations that the preliminary fieldwork had revealed.

The next step aimed at **focusing and zooming** on a more narrow area through some discussions with other designers and by analysing the potentialities of the early concept scenarios. Since the work had not clear direction and the graveyard field dealt not only with on-site interaction but

also with other interesting topics, during this phase my own interests and thoughts about the most promising direction have been determining too.

The focused area has generated a need for **deeper investigation**. I've made some interviews and other on-site observations, as well as a survey of the literature. Moreover, I've selected works and projects that were closer to the chosen area. The concept work has been iterative so that I've been always able to browse through different ideas and aspects of the problem.

The focused research has identified and confirmed some constraints from which I've developed functional and non-functional **requirements**. Having requirements and constraints has been fundamental for the concept phase.

The very **concept phase** has been conducted in two iterative steps: a **brainstorming** activity, followed by **discussions** with supervisor and other designers. The ideas have been discussed also with random interlocutors. The brainstorming has been based on paper prototyping (Snyder, 2003) and sketches as well as with some rough performance in a fictional space. The following discussions aimed to catch the pros and cons of the idea and the possible variations. The chats with random people were more focused on having some hints on what was the user perspective on the idea. This two-step phase has generated different concepts and metaphors that have been analysed without any restrictions. The found constraints and requirements have been applied on the whole material produced in order to **filter** it until some solutions were identified as alternatives. The resources considered for the evaluating the different **alternatives** (Krippendorff, 2006) have been not only technological since also the socio-material consequences of each design have been taken into account.

Filtering the alternatives left me a **main concept**. Anyhow, the other ideas are still present as variations and inspirational vision of the field. The main concept has been **designed** from a static to a dynamic perspective through the use of **UML diagrams** (Pilone & Pitman, 2005) and then presented in a **seminar** where I've presented the work done and the process in order to get feedback and stimuli.

After the presentation, I've developed a **mock-up** (Ehn & Kyng, 1991) of the system to assess it and get feedbacks on some aspects, like content, I had

left quite open. The **assessment** has been conducted through performances (Iacucci, Iacucci & Kuutti, 2002): a fictional space was created and the participants were asked to stage the interaction.

The final design has been expressed through a physical and interactive prototype based on the **Arduino**<sup>13</sup> board and the open-source programming language Processing<sup>14</sup>.

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<sup>13</sup> [www.arduino.cc](http://www.arduino.cc)

<sup>14</sup> [www.processing.org](http://www.processing.org)

## 2 THE DOMAIN OF THE GRAVEYARD

In this preliminary analysis I've conducted an explorative investigation that had not a fixed route. I've analysed the graveyard as more than a physical context, looking at the different areas that could be connected to it. At the same time, I've searched the literature and the web to find related projects, in order to have some representative works.

The wide area of the graveyard domain has been divided into four *sub-domains* that are strongly connected. Anyhow, looking at different aspects of the graveyard allowed me to face constraints and situations that generated an inspiring set of stimuli and perspectives for the concept phase.

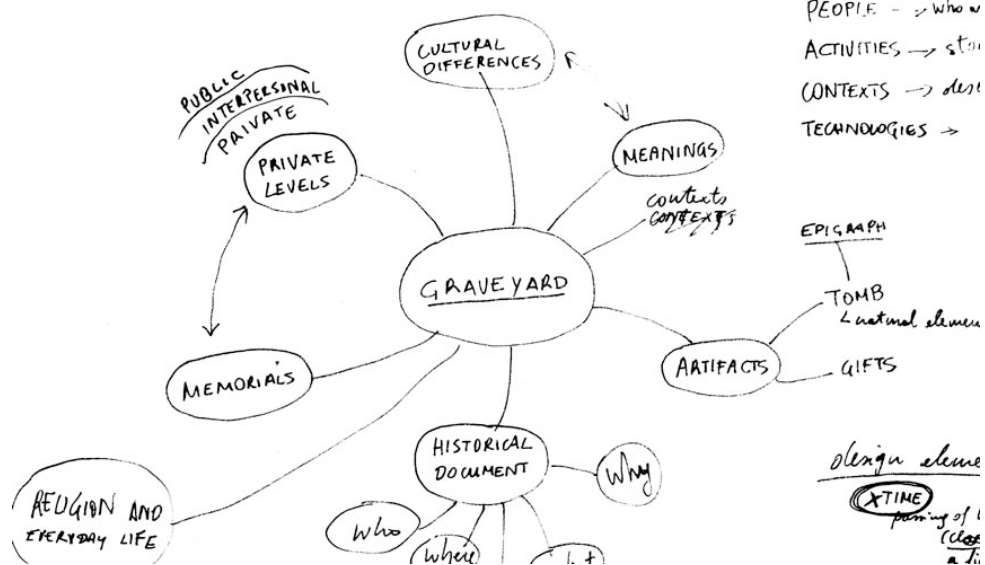


Fig. 2 The domain analysis

The four sub-domains are discussed here separately so that the reader can have an idea of the richness of meanings, practices and questions, as well as of the possible design directions. Every sub-domain is followed by a project considered relevant.

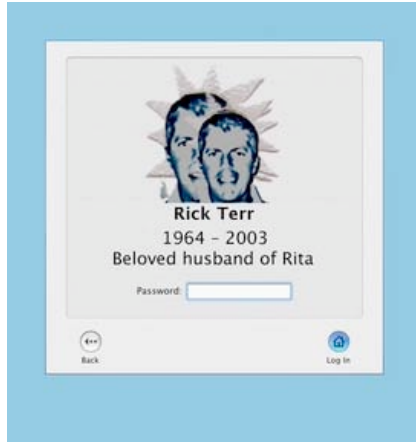
## 2.1 IDENTITY AND AFTERLIFE

Today we are able to manage our identity through the web since our data are collected and stored in digital form. Email, music and bookmarks are just some example of the degree of control we can have on identity and its derivations. Since technologies are potentially able to track and store our experiences, what if we could use them to have richer and more complete memories? One of the biggest problems of recalling our past is that there is always something missing. Even if we have a very good memory, our recalling is getting more and more media dependent.

Most of us want to leave a trace on this world and be remembered in some ways. Anyhow, these traces are becoming more and more digital. As a consequence, technology can track our preferences, habits, and identity. But what happens after our death? Are our data still useful or they could be deleted forever?



to spend hours in doing that. Systems can be more fluent and work without asking for all your cognitive attention.



**Fig. 5** The login screen

When working with identity and afterlife we are not aiming at accomplishing a task or achieving a goal in the traditional sense. We are dealing with experiences. On one side, Digital remains gives you the chance to select photos, mails, and documents, making them available to the others after your death. On the other, you can

retrieve this set of data and explore them in the way you prefer. What I doubt is if a virtual interactive system that tags your data is a good solution. It should be quite clear that the screen-based interactions lack embodiment (Dourish, 2001) since you are not living the space but sitting at a desk.



**Fig. 6** Different types of access keys

What I like about Digital Remains 2.0, as I saw from some videos on the web<sup>16</sup>, is the idea of having a token that works as an access key to the system:

“Access keys, when placed next to a mobile phone, MP3 player or computer, establish a bluetooth connection with the device and trigger a remote log-on to the digital remains of the deceased person they are linked to, allowing a person to access the dead person's data”<sup>17</sup>.

<sup>16</sup> <http://michelegauler.net/>

<sup>17</sup> *ibidem*

The strength in this object is that it is very customisable: you can choose the colour and the texture, you can put your loved one's name on it, maybe a short epigraph. Giving people things is very important in these situations since it is from the physical level that the experience begins to grow and these tokens are something that you can look at, touch, carry with you.

## 2.2 MEMORIALS

*“These memorials are reflections of genuine emotions experienced by real people, and they are surely entitled to be respected as such”<sup>18</sup>*

Another manner to look at graveyards is as memorials. There is a peculiar connection between time and place when we take memorials into account: Tuan defines memorial as “place as time made visible, or place as memorial to times past” (Tuan, 1977:179). It is worth for this work to look at two different types of memorials that identify also different roles in society:

- *Collective and commemorative*: these are historical documents dedicated to events that have been important for the history of the community. They are collective and represent more than one person's death and they are often designed to communicate a strong message like frailty of life. Often they are built because the community wasn't able to recognize all the passed away.



**Fig. 7** The Holocaust Monument in Berlin

- *Personal and contextual*: the most famous representative of this group is the roadside memorial or *descanso*, which means resting

<sup>18</sup> Dave Nance – [www.webpages.charter.net/dnance/descansos/](http://www.webpages.charter.net/dnance/descansos/)

place<sup>19</sup>. This kind of practice was born in New Mexico. Descansos are very context dependent: this is the biggest difference with graveyard, where everyone is buried in the same place. Moreover, people build descansos in a very personal way and feel free to leave on the resting place gifts and artifacts related to the loved one.



**Fig. 8-9** Examples of Descanso  
(watson-online-art-gallery.com)

An important function of this kind of memorials is that of warning<sup>20</sup>: for instance, they could warn drivers of the possibility of a car accident. They are also a way of protesting against the local administration.

The interesting thing about memorials is that they can communicate not only with the bereaved but almost with everyone. Unlike tombstones, they are capable of communicating with people in a more powerful way, even if there is no technology behind them. Probably, this happens because they are not enclosed into a cemetery where all the conventions and behaviour models come up and can be designed in a more creative way.

Today, memorials are also on the web in the form of websites that allow visitors to leave messages, photos and videos. Like their physical counterparts, Web cemeteries permit the bereaved to create individual

<sup>19</sup> In the wonderful way of the Spanish language, it literally means “untiring place”. Descansos are used as landmarks by people to mark a place for something: in the beginning, they were built where the procession stopped to rest (there were no cars to carry the coffin) but now some of them are pieces of folk-art

<sup>20</sup> In France, the administrations are putting black figures on the roadside to warn about dead people

memorials to their dead, to visit, and while there, to demonstrate their affection<sup>21</sup>. Anyhow, these attempts of digitising a place like a cemetery have as drawback the total loss of embodied experience.

### 2.2.1 TRANSMISSION

Transmission, by George Walker, is a proposal based on the message roadside memorials are able to communicate (Everett, 2002). Instead of



**Fig. 10** The piezoelectric transmitter

visual signals, death statistics or warning message, Walker proposes to insert a transmitter into the road at the site of each non-motorist (pedestrians or cyclists) fatality, communicating the name of the person killed and the number of days since they were hit.

The system is based on a piezoelectric generator that gives powers to the transmitters using the pressure of the tires rolling over it. As a consequence, the signal will be more frequent and powerful as the traffic is heavier. When you drive within the range of the transmitter, you receive the transmission through you car audio or phone since it is able to overlay the message. All the fatalities are documented in a memorial website where the bereaved can post messages. This simple but powerful idea uses and enhances the function of roadside memorials.

## 2.3 CULTURAL DIFFERENCES

We live in a global world where almost everything is interconnected and becoming more and more contaminated. Global versus local is one of the hottest themes of our times and we know that it is not so simple to mix them together without losing the peculiarity of the localism or the mixtures of the globalism.

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<sup>21</sup> An interesting and recent example of web memorials is [mydeathspace.com](http://mydeathspace.com), a directory where dead bloggers' sites are collected

Graveyard or, more extensively, burial practices differ from country to country and from religion to religion. There are so many themes and



**Fig. 11** Human DNA trees as living memorials (biopresence.com)

cultural issues involved that even, for instance, in the same religious community, there are peculiar differences. These differences have a common ground since they are the expression of similar feelings. We should appreciate every perspective and elicit the good: every difference has its own reasons and, especially in our times<sup>22</sup>, they all are valuable and truthful.

Different cultures are able to catch and underscore different sensibilities and view on Life and Death. Beyond the religious and historical differences, the relation between the cycle of Life and the role of Nature is quite cross-cultural. Life can continue in other worlds or just ends with Death, but our body is part of nature and of its materiality. Maintaining a link with the material world has always been a need for the ones who want to remember and the ones who would not like to be forgotten. This could be accomplished through symbols that trigger our memories in many different ways. But this need also generates a set of practices and believes that go from the social to the more religious ones.

Obviously this work will not be able to cover all the cultural differences related to the burial practices. My field research has been limited to some of the European graveyards where there is an acceptable level of cultural mixture. The final design is not supposed to satisfy all the difference: the attempt would lead to a reduction of all the richness that every religion, tradition and culture have. Anyhow, it tries to realise its goals in respect for them.

<sup>22</sup> Our times area characterised by the end of the grand récit (J.F. Lyotard, 1979): we have no more ideologies and all the voices deserve to be considered (G. Vattimo, 2000)

### 2.3.1 BIRD FEEDER

*“A bird feeder made from bird food and human ash. The person is reincarnated through the life of the bird” (N. Jarvis)*



**Fig. 12** Bird Feeder

*Bird Feeder* by Nadine Jarvis<sup>23</sup> is about a bird feeder made of bird food, beeswax and human ashes. The idea is that as the birds peck away, the urn disintegrates, leaving behind a wooden perch inscribed with memorial details about the deceased. In Jarvis’s words: “The ash is mixed with the bird food, causing the bird to eat the person”. This is a strong image of the relation between

Life and Nature and I doubt its intercultural validity. The point is that not every culture associates Death with the action of eating. The idea of spreading our remains in nature is interesting and valid but this is quite far from throwing ashes into the air or urn preserving. We all know that Nature is fundamentally harsh in its logics and cycles. Anyhow, sometimes design aims at criticising values and established systems by exploring unconsidered alternatives (Dunne & Raby, 2001). In this sense, the work done by Jarvis is a piece of critical design that instead of affirming the known and accepted practices, makes us reflect on the essence of human nature and on how Life and Death are connected.

### 2.4 ON-SITE INTERACTION

The fourth design area looks at the graveyard as a physical environment where interactions happen. I have outlined this direction because considering the space of graveyard is an interesting direction for design. This sub-domain, in fact, reminds me of the complexity that constitutes graveyards. This is not only about its physicality and functions, but also about the other levels of experience I have outlined before. This sub-domain, then, takes into account the possibilities of supporting on-site interactions and practices. The interest from the point of view of the

<sup>23</sup> [www.nadinejarvis.com/projects/bird\\_feeder](http://www.nadinejarvis.com/projects/bird_feeder)

Interaction Design is also in the fact that graveyards are something like an off-limits zone where real design solutions haven't showed yet. Graveyard is a set of contexts, situations and practices that does not like innovations. So when designing for such a place one needs to be aware that this has to be done respecting the existing rules and conventions. As McCullough states:

“Despite so many innovations, many forms of conviviality seek ritual types in the built environment. The endurance of these types is the very basis of their appeal. Churches and other sacred places remain foremost among these. [...] We frequent chapels, arenas, ballrooms, historic landmarks, and personal ritual sites because we want to. The more that any of these has been used in a culture, the more it seems natural” (McCullough, 2005:138)

This area reminds of the importance of a situated and embodied interaction where the bodily and sensorial components play an important role as well. The routes that this sub-domain opens are endless. On one side, the designer could allow himself to arrange different visions of a possible future. It would be an artistic and powerful way to see how much we can stretch a hard context like graveyard. Another good direction would be the analysis of the relationship between cemetery and technology that has always been tricky because of cultural and religious issues. However, nobody knows how our convictions will change in twenty years.

### **2.4.1 CEMETERY 2.0**

*Cemetery 2.0*<sup>24</sup> by Elliott Malkin is “a concept for a set of networked devices that connect burial sites to online memorials for the deceased. The prototype links Hyman Victor's gravestone in Chicago, to his surviving Internet presence [...]”<sup>25</sup>. The device maintains a live satellite Internet connection allowing visitors to view related data on a display.

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<sup>24</sup> <http://www.dziga.com/hyman-victor/>

<sup>25</sup> *ibidem*

The design rationale is that when a person goes to the cemetery visiting her loved one or maybe just visiting a grave, she would like to have an interface and access to all sorts of data related to the deceased. This would not be far from what this work is looking for, but Cemetery 2.0 is too much focused on the efficiency of the interaction. Even if this is a good point, since visitors can retrieve a lot of information, a more important issue are the

emotional and poetic aspects of the interaction and how visitors experience them. As Wright et al. argue that design for experience is designing for possibilities (Wright, McCarthy and Meekison, 2003). An on-site solution, then, should be designed with more attention to the experiential side of the interaction, even if this means accepting some efficiency trade-offs.



**Fig. 13** Cemetery 2.0

## 2.5 THE GRAVEYARD AS PLACE

The identified areas are different aspects of the same domain. Identity, memories, cultural differences and physicality correspond to constitutional dimensions addressed by Tuan. Looking at them independently would mean losing the richness that the graveyards have: being a whole that is more than the mere sum of its parts.

In the following sections, I will present the fieldwork conducted in three graveyards situated in Malmö with a focus on gaining a thorough understanding of the way they are experienced by people. In doing so, I will apply the structure outlined by Tuan and discuss the constitutional dimensions of graveyard as place. This analysis will discuss the richness of meanings, practices, habits, feelings and experiences that are what characterise a place and differentiate it from a space or physical environment.

The fieldwork observations have been conducted in three graveyards situated in Malmö:

- *Gamla kyrkogården*, located right in the centre of town and first consecrated in 1822. It houses the remains of some of the city's most famous citizens;
- *S:t Pauli kyrkogårdar*, located in the East part of Malmö, that houses a Jewish and a Roman area;
- *Östra kyrkogården*, situated in the very East of the city.

The articulation of the dimensions of the graveyard as place highlights relevant features to be considered in the subsequent phases of the design process:

### 2.5.1 THE PHYSICAL DIMENSION

As sacred places, all the analysed graveyards show a basic spatial pattern that repeat with variations. The space of each graveyard present one or more entrances and paths that allow people to reach the graves. There is not a clear criterion on how graves are positioned and the visitors have to know where to go. My observations have been focused on the space of the grave and on its different instances because this is where the placeness of the graveyard is better expressed. Here are some elements that are common to the space of the grave:

- the *fence* identifies an “inside” and an “outside”. It works as a privacy guard and often as a deterrent for the interaction. Anyhow, a lot of tombstones have not fences and are more integrated with the environment;
- the *headstone* is where you can read the name, date and often an epigraph. It aims to communicate the identity of the deceased;
- on *bench* people sit and pray. It has a resting function for older people. The bench is not always present;
- the most interesting element from the design perspective is what I’ve called the *gift area*. It is often a square or a stripe where people leave

gifts like flowers, seafood shells, and fruits. This is the very interface between the deceased and the person since it is the place where interaction occurs. Its position is also relevant: it is always between the headstone and the bench.

This means that it is a sort of mediator between the two worlds. Moreover, it has also an important role in communicating with other people: one of the interviewed said that she cared of keeping this area always well decorated because of other people.



**Fig. 14** The typical structure of a grave

In the end, I have categorized the tombs in two couples of dichotomic categories (open and close, decorated and abandoned) to have a clearer view of the different instances.



**Fig. 15-16** Closed and open graves



**Fig. 17-18** Decorated and Abandoned graves

## 2.5.2 SEMI-STRUCTURED INTERVIEWS

For a better understanding of the personal and socio-cultural levels I have conducted some semi-structured interviews in the graveyard, when possible, and at people's places. The interviewed have had some degree of freedom and sometimes went off from the topic of the discussion but I didn't stop the conversation since it would have broken the informal tone it had taken. I have summarised the key points here:

- Going to graveyard is also an occasion to **meet other people**. You can meet old friends or people you haven't seen for a long time.
- In the past, people used to stand in front of the tomb for a longer time and had the **occasion to talk** about the deceased, about her life. That was only a starting point: the discourse could evolve towards different themes, not always related to the deceased.
- Abandoned tombstones may have a great appeal. Many people use to leave a flower on a tomb they don't know, just to feel better. For some of them leaving a flower has become part of the visit. It is like "**adopting a grave**". Others prefer leaving flowers randomly. This is apparently done for personal satisfaction<sup>26</sup>.
- Some people don't like to go to the graveyard so often because they prefer to have "a **memory** of the person alive".
- It is common to bring a **photo** always with you, especially if the person was a relative. Moreover, some people have something that belonged to the loved one with them, like tools or a jewel.

## 2.5.3 THE PERSONAL DIMENSION

The grave is a space where people stand, sit and reflect. It is the area where they try to establish a contact with the deceased, mainly based on the memories they have about her. Most people usually think of the good times

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<sup>26</sup> <http://www.43things.com/things/view/156677>

they shared with the deceased, but this happens when they are close enough to her.

The objects and mementos people leave on the grave reinforce the personal dimension of it. This practice probably originates from African burial practices<sup>27</sup> but almost all cultures had and have their own ones. Their meaning cannot be reduced to a single interpretation. Some of the things left on the grave have a very personal meaning while others are related to the deceased's identity.



**Fig. 19** Shells

The most common mementos I have found during my observations are toys, clothes, food, and seashells. Their meaning is a mix of culture, tradition and personal feelings. Some people use to carry something with them to have a stronger and more vivid experience once in the graveyard. One of the interviewed, for instance, told me that she likes to have a tape player with her and listen to her husband's voice while she is in front of his grave.

It takes just a walk to be aware of how many traces of interactions and symbols people leave in the graveyard. Most times the adornments and the



**Fig. 20** Toys

things left on the grave make it unique. What people leave are not just 'things', i.e. a contribution to the physical layer, but symbols carrying meanings and memories. For instance, leaving a flower affects not only the physical setting, by changing the geometry of the space, but other levels of experience as well. It has a coded meaning because someone associated to that signifier (the sensorial part of the flower, the physicality of the symbol itself) a signified (the meaning it carries). The flower affects also the personal layer of that place because it triggers the memories of the person who left it. It is clear that a lot of times we just

<sup>27</sup> <http://sciway.net/hist/chicora/gravematters-1.html>

leave a flower as a result of a ritual, but here I'm considering the meaningful cases. If we look at that flower from a social perspective, again, it can appear as a trigger for a discussion. In the end, the flower affects also the cultural layer of a place because it is a recognized artifact that the community uses in a specific place.

### 2.5.3.1 SYMBOLISM IN THE GRAVEYARD

The things people leave in the graveyard are, first of all, signs in the sense that they are composed of a *signifier* and a *signified*. The first one is the physical medium, what we perceive with our senses. The signified, instead, is the implied meaning (de Saussure, 1983). For instance, if we think of the spoken word 'cat', the signifier is the sound we hear, while the signified is the meaning of the word 'cat'. The association between the two entities is arbitrary in the sense that it is a linguistic community that chooses to connect the sound of the word 'cat' to a specific meaning. This association, then, is a consequence of a cultural law shared by the community. In this case, we can say that the sign 'cat' is a symbol. Symbols, then, are a category of sign that are arbitrary and conventional. When we leave a flower on the grave, we are using a symbol because it assumes a conventional meaning and function. Obviously, the context in which the flower is used influences its meaning: the flower in fact, can also mean love when, for instance, we give it to our partner. This means that the law that determines a symbol is dependent on the context as well. As a consequence of their arbitrariness, symbols are not universal but determined by cultural, social or personal laws.

Some of the artifacts left on the grave are personal reminders that cannot be connected to a traditional and diffused practice: often the things we leave have a very private meaning interpretable by a narrow community. This case is interesting since it is a creative way of leaving a trace that it is not forced or linked to any traditions. Even if we can find some roots in the history and traditions, the meaning of most graveyard symbols is still discussed and professional scholars disagree about their interpretation<sup>28</sup>.

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<sup>28</sup> [www.gravestonestudies.org](http://www.gravestonestudies.org) and [www.state.sc.us/scdah/cemsymbolism.htm](http://www.state.sc.us/scdah/cemsymbolism.htm)



**Fig. 21** Stones on the headstone

The symbols we find in the graveyard depend also on the background of the person who left them. For instance, leaving a stone on the headstone shows that someone has visited and represents permanence. It contrasts with flowers, which do not live long. The items associated with water, like shells, pitchers, jugs, vases, are linked to the *Bakongo* belief that the spirits pass

through a watery world in their journey to the afterlife, but are also a symbol of a person's Christian pilgrimage or journey through life and of baptism in the church. The upside-down position reflects the inverted nature of the spirit world, while the breaks allow the object to journey to the next world and serve its owner. Objects associated with light (lamps, candlesticks) are meant to help lead the spirit to the spirit world. Glass and mirrors show the "mirror image" of this life compared to the next<sup>29</sup>.

#### 2.5.4 THE SOCIO-CULTURAL DIMENSION

The social dimension of the graveyard is very weak. Social relationships, in fact, are reduced to the minimum since everything is conducted in silence. The only allowed communication is the whisper. Anyhow, this happens only when the visitor is alone. Being with other people is a trigger for recalling the past and sharing memories: some people like to have a walk through the graveyard and use headstones as landmarks of their past. Anyway, the social dimension of the graveyard seems a consequence of the contemporary individualism as well: in the past, it was a place where people were more likely to sit and talk about the deceased.

From a cultural perspective, most people are aware of the rules and conventions, and adapt their behaviour to them. The graveyard asks for silence and discretion. As a sacred place, it has its set of rituals that people have to follow in performing certain activities.

<sup>29</sup> <http://www.state.sc.us/scdah/cemsymbolism.htm>

### 2.5.4.1 THE ROLE OF RITUALS

The way people behave in the graveyard is often conditioned by the role rituals play in this type of context<sup>30</sup>. A ritual is a set of actions with a recognised and symbolic value that is prescribed by a community or a group.



**Fig. 22** Different types of rituals

There are single and group rituals and they can be performed at regular intervals or on specific occasions and situations. A ritual enables or underscores a moment of passage between different states, usually social and religious ones: when you enter a Catholic church you are supposed to dabble your fingers in the holy water and then do the sign of the cross. In this way you connote your passage from the outside and everyday world to the spiritual and religious space of the church.

We have rituals in everyday life too. Think about shaking hands when somebody is introduced to you. A shared set of actions (coming closer, shaking your hands and then saying something like ‘Nice to meet you’) underscores the moment, in this case a social one. Rituals are culturally determined and that’s why in Japan they do not shake hands.

Graveyards are full and modelled by rituals. Most of the activities people perform inside its boundaries follow rules belonging to one or more rituals. Leaving a flower or a candle, touching the headstone and then standing in front of the tomb is part of a recognised ritual.

<sup>30</sup> Memorial place are places for rituals (McCullough, 2005)

## 2.6 DESIGNING FOR THE GRAVEYARD

In this chapter I have explored the graveyard from different perspectives. Analysing the domain in its constitutive parts (identity, memorials, cultural differences and on-site interaction) has been useful to identify the richness of meanings, practices and contexts involved. It has also been important to clarify my design direction. I have chosen as focus area the on-site interaction because it embraces almost all the considerations and findings related to the other sub-domains. Moreover, it is a good test for the theoretical framework I have been outlining and the discussion on experience and place I have been articulating.

On-site physical not only involves the consideration of the physicality of the locale and what and how people interact within it. It also implies the consideration of the other levels of experience (personal, social and cultural) and the related layers of interaction (cognitive, socio-collaborative and emotional). Designing for on-site interactions means supporting people and their relations with the grave. It means enhancing the silent dialogue between deceased and bereaved, but respecting the cultural and social rules, how people behave in the graveyard, what is allowed and what is prohibited. Designing for physical interactions in the graveyard means also taking into account the social dimension and try to support and stimulate the social relationships.

These considerations make clearer that designing for on-site interaction means design for graveyard as place and for people as human actors (Bannon, 1991) who have complex relations with the context and interact on different levels of meaning.

I have chosen to work mainly with the practices of memory and explore how technology can enhance this type of experience by supporting the interaction between people and place. Memory is the main form of content people deal with in the graveyard. From a design perspective, these considerations can be translated into a set of requirements for the system the design process is going to produce.

## 2.7 REQUIREMENT ANALYSIS

A requirement is ‘ [...] something the product must do or a quality that the product must have’ (Robertson and Robertson, 1999). The aim of this analysis is to produce a set of requirements that will guide the design process through the development of an interactive system.

As result of the fieldwork and of the considerations about the physical interaction in the graveyard, it is possible to generate a set of requirements for the system I will design. However, a thorough understanding of requirements is possible only until some design work has been done. It is important to underline that this analysis does not specify how technology will meet the requirements but aims at outlining what the system must do and the qualities that it must have.

At this point, it clear to me that the system must be able to manage a content that will be related to the domain of memory. From a functional point of view the system will operate as an interactive content manager that allows people not only to retrieve the stored content but also to leave their own contributions. The functional requirements will be:

- The person must be able to retrieve and leave a content related to the deceased;
- The system must store and manage the content.

Functional requirements are not numerous since the functionality of the system has to be essential and simple. On the other hand, non-functional requirements are in this case crucial because they deal with the qualities a system must have or, in other words, they concern the way functionality operates (Benyon, Turner and Turner, 2005):

- The interaction has to be **discrete** and respect the socio-cultural and religious conventions. Silence is the main way of respecting the deceased and other people. During the fieldwork a discrete way of interacting has emerged. Slow and relaxed movements together with whispers compose the way of behaving in the graveyard;

- The interaction has to be **non-invasive**. It was hard approaching people in the graveyard. Most of them did not want to be interviewed because of the situation. The traditional experience of visiting the graveyard has to remain intact;
- The graveyard is a context that, as most sacred places, is based on the endurance of its features. The system has to be integrated into it in order to not be perceived as something new and not accepted;
- Most people don't like to have technology within the graveyard. During the fieldwork, I have been able to observe what people use to leave on the grave but also what is their relation with electronic device (e.g. mobile phone) while in the graveyard. Most of the graves are adorned in an intimate way and low key-manner. Even when there are flowers, pictures, toys or other types of gift, they are not meant to draw the attention. In this sense, technology is perceived as a conflicting element.  
The design has then to avoid high-tech solutions for **low-fi** technologies that are more likely to be accepted. Moreover, the interface has to grant a **natural style of interaction** and take into account the importance of the sensorial level in the relation with the grave. Since the concept of natural is always culturally based, the goal is to find an acceptable trade-off;
- The interaction design has to take into account the **rhythm and tempo** of the interactions. The context has its own specific flows and people should perceive a passage to a different pace. The tempo has to follow the calm, deep and relaxed atmosphere of the place;
- The social dimension of the graveyard is not strong. However, there are social moments of sharing and interaction. Sometimes, the family gathers or people meet old acquaintances in the graveyard. They usually talk about the deceased, sharing their memories. But often

the deceased herself becomes the centre of a wider conversation that encompasses different topics.

In design terms this means that the system has to be open to new uses and interpretations. It has to support **social actability** (Löwgren, 2006) and the **sharing** of experience in order to enhance the social dimension of the graveyard and the relations between people and memories;

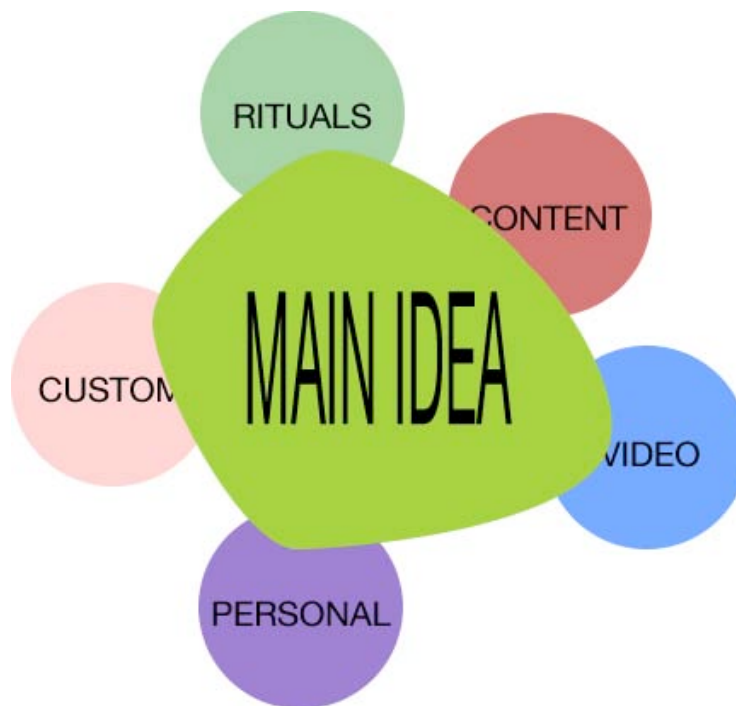
- The system has to be **customisable**, allowing people to make it personal and unique, and open to new uses and interpretations. The attention people put in the artifacts they leave on the grave or carry with them in the graveyard, suggests the importance of the personal dimension.

## **3 ENVISIONMENT AND FINAL DESIGN**

In this final chapter I will discuss the exploration of design alternatives, and what have been the considerations and the choices that contributed to the final design. I will also describe how the prototype has been developed and built.

### 3.1 THE ROLE OF ALTERNATIVES

As described in the fieldwork chapter, the graveyard is a rich context that carries many different meanings, which can be approached from various design perspectives. My focus area, the practices of memory, was the result of exploring several alternatives during an early concept development phase.



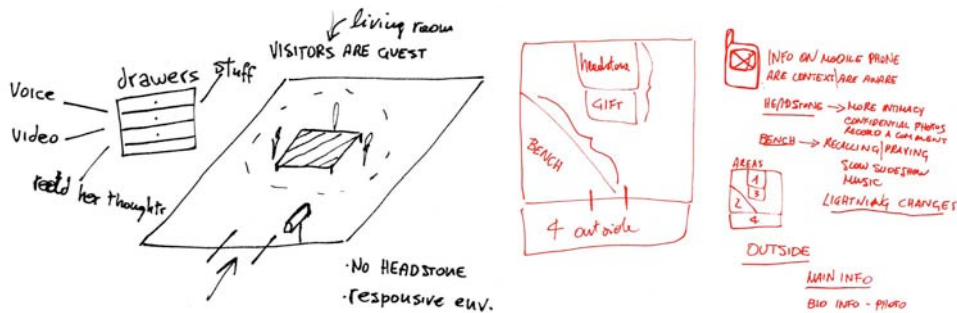
**Fig. 23**  
Alternatives contribute directly to the main idea by stretching it in different directions

Having different alternatives has been very important to analyse and decide which direction the design should have pursued. The more alternatives a designer is able to identify the more complete is the overview of the domain she is working with. Moreover, every alternative is a step towards the final concept and always contributes to its definition in some way.

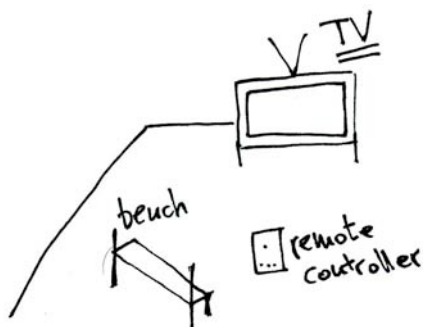
I will describe most of the identified alternatives even if some of them are not well-structured and probably should be considered just as an inspiration. Anyway, it is worth it to have a sort of overview on the work done in order to see also what the potentials are for designing for graveyards.

### 3.2 EXPLORING THE POSSIBILITIES

My initial approach was oriented to the redefinition of the space of the grave. These ideas were based on the possibility of rethinking what a grave is and what we can do with it. This perspective is very interesting and critical because it aims at challenging the established values and conventions and is really able to outline different and alternative scenarios in regards to our relation with the grave. In the sketches below, for example, the grave has been turned into a sort of outdoor living room. In the centre there is a table around which people could sit and talk, and a dresser containing physical and digital data related to the deceased have replaced the headstone.



**Fig. 24-25** Studying the physical space of the graveyard led me to identify different areas and different functionalities. Here are some sketches about how space and activities could be related.



**Fig. 26** The grave as a familiar space. De-contextualising an activity (watching TV at home) to make the interaction with the deceased more familiar.

Taking into account different technologies allowed me to think of scenarios where traditional objects could be technologically augmented in order to enhance the experience. Here are the examples of a RFID flower that can store a multimedia message that can be accessed via mobile phone, and a candle that when lit up visualizes a message on a OLED display.

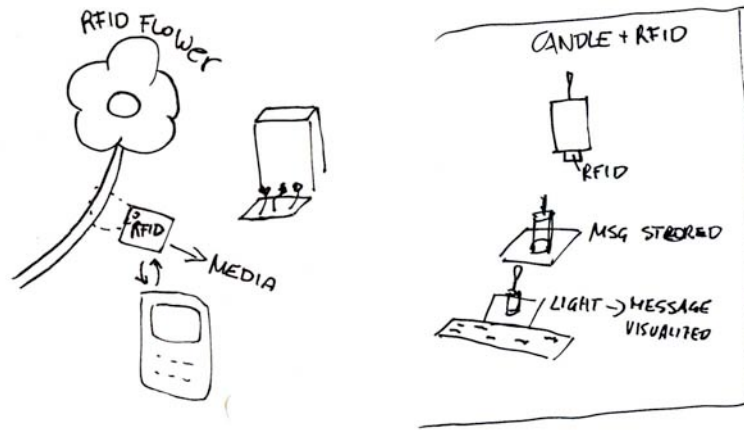


Fig. 27-28 The RFID flower and candle

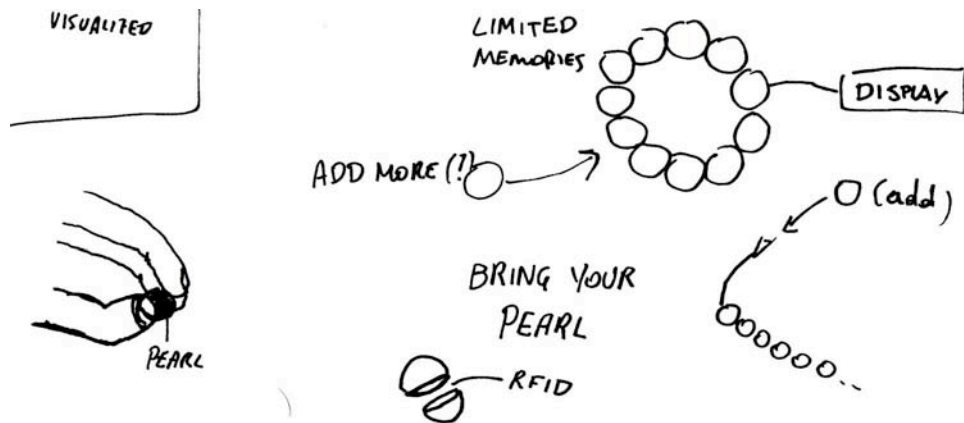
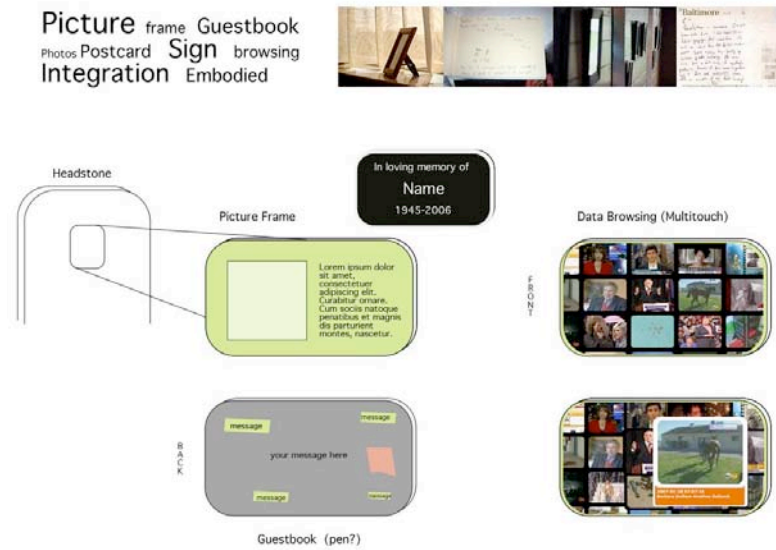


Fig. 29 Some alternatives explored the role of the personal dimension. This string of beads is a rosary used for counting prayers that is able to store media content

I have also explored alternatives that challenge the traditional function of the headstone trying to foresee how technology and grave could be related when ignoring the pre-eminence of socio-cultural and religious conventions.

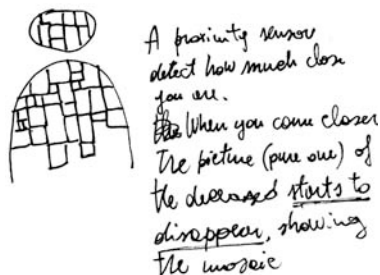


**Fig. 30** A multimedia device that when placed into the headstone shows the picture of the deceased but once picked up becomes an interactive guide through her afterlife.

On the same topic is this less invasive idea. Its design rationale is based on the consideration that our identity is more and more depending on the people we know or on the nodes of the social networks we are involved in. In these ‘network times’ we are not aware that our identity is spread through the networks and we cannot define ourselves without referring to the social relationships we have.



**Fig. 31** Sending pictures to the video headstone



**Fig. 32** Sketches of the idea

The outlined solution is a headstone built-in display that works as a traditional picture, showing the photo of the deceased. A sensor detects your presence and as you step closer the picture disappears showing the underlying image.

This one is a sort of digital mosaic whose pieces have been sent by mobile phone

MMS. These pieces could represent the experiences of people known by the

deceased and in which she continues to live.

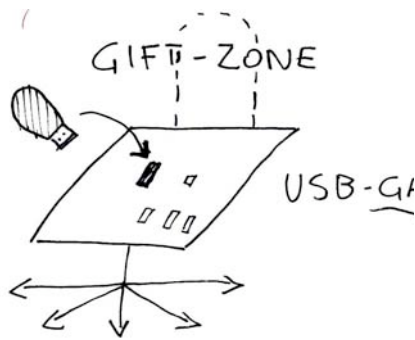


Fig. 33 USB garden

Another interesting theme to work with was the gift, which is what symbolically links the visitor's presence to the deceased. This concept focuses on what I have called 'gift zone' and transforms it in a USB garden where you can insert your pen drive and upload multimedia content.

Another concept explores the possibility of having a personal artifact that could be carried with you. The idea was inspired by the memory box people use to preserve things related to the past. As a personal object, you can use it as a repository of photos,



Fig. 34 Memory boxes

mementos, letters related to the deceased. But it works also as a multimedia container where you can put sounds and images. The box, however, will not work if you are at home on your sofa. You need to bring it with you to the grave the box is associated with.

All the presented alternatives have been important not only for the development of the main concept but also because they made me aware that the requirement analysis was not complete. Concepts like the video-headstone were interesting explorations and had a critical sense. Anyhow, they were not **feasible** and one of my goals was to realize a concrete and practical design.

In the next paragraphs I will discuss how my main concept has been defined and describe its use qualities. I will then discuss what have been the choices and the trade-offs taken into account to define the final steps of the process and the physical prototype.

### 3.3 FROM THE RADIO TO THE SEASHELL

The final concept has been inspired by the interactive installation ‘Radio’ developed by the University of Limerick within the project called “Re-Tracing the Past: Exploring objects, stories and mysteries” (Brazil & Fernström, 2004). The project was an interactive exhibition where visitors were encouraged to investigate mysterious objects and then leave their opinion about them. The interactive radio allowed visitors to browse channels and hear other people’s opinions.



**Fig. 35** The Interactive Radio in the Re-Tracing the Past Exhibition

Allowing people to interact with a known interface and through a familiar style of interaction is the strength of this project. Moreover, the possibility of browsing channels and listening to different audio contributions was interesting.

Having a radio within the space of the grave seemed inappropriate and against most of the outlined requirements. Anyhow, this did not imply that sound could not be used in a discrete and personal way, for instance like a whisper. Moreover, a sound interaction avoids some of the problems pertaining to having a visual one; for example, a sound interface can be easily integrated with the context since it does not need to be seen. Some reflections and new field observations were needed to define how the idea could be contextualised and how an audio interactive system could be discrete and mostly for individual listening. I figured then out that one of the most common artifacts I had found during my field study could solve these issues: a seashell where memories of the deceased could be stored and retrieved.

First of all, it was very **contextual**, one of the most common adornments. This is because of the various meanings different cultures associate to it. It had slightly different interpretations but since these were not in conflict it was not a drawback. Moreover, being contextual meant that it had already been accepted.

The seashell is **natural interface** and its affordance, hearing the sound of the sea, is commonly known. In the end, the shell appeared to be a **good auditory interface** that could work quite well as an audio interactive system.

### 3.4 PEOPLE NEED THINGS

Some time ago I read in an article that *people need things*<sup>31</sup>. In the graveyard, having something material, that can be touched and felt, is an important support for experience. A **tangible** and graspable interface makes possible a style of interaction based on the sense of touch (Ullmer & Ishii, 2002). Being able to touch and play with the interface reinforces its affordance: a virtual seashell would not provide the same feeling as a real one.

**Portability** is another issue that needs to be taken into consideration. A built-in interface, like the display concept, would force people to stand close to the headstone, while I want a system that can be carried and moved. Portability is another important requirement, even if it raises some drawbacks related to the possibility that the product could be stolen<sup>32</sup>.

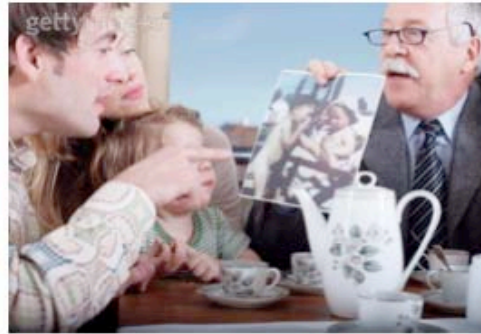
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<sup>31</sup> Sean O'Hagan, The Observer 2007

<sup>32</sup> Some graveyards are adopting RFID security systems to prevent stealing. See [www.textually.org/picturephoning/archives/2005/06/008593.htm](http://www.textually.org/picturephoning/archives/2005/06/008593.htm)

### 3.5 AN EMERGING SCENARIO

Some days after his funeral, Frank's family gathers. His wife takes a photo album and they start to talk about him...



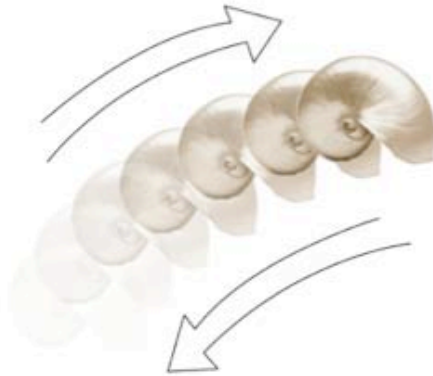
While recalling Frank, they fill the conch with their memories: what he liked to do, some stories and everyday things



The day after they bring the seashell to the grave together with some flowers and candles...



Two weeks later, his best friend Paul comes by. He knows about the conch and picks it up...



He shakes it and listens to a short intro ("Here lies") that tells him who Frank was...



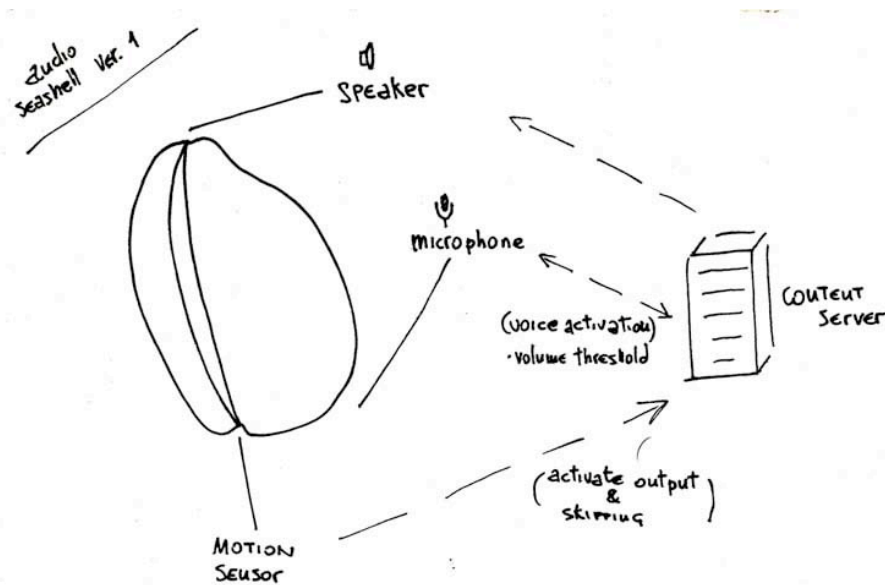
He listens to different traces and is touched. Then he decides to sit on the bench and pray for his dear friend. Meanwhile, his wife reaches him: they share the shell and can listen together...



After that, Paul decides to record something about their travel through Europe.

### 3.6 THE INTERACTIVE AUDIO SEASHELL

In these final paragraphs I will describe the details of the interactive audio system. In Appendix I the reader can have a look at the UML diagrams that offer a different view of it.



**Fig. 36** The first version of the system

In a first version, the system included a voice activation system and a motion sensor that were responsible for the activation and the control of the interaction. The device communicated with the content server via Bluetooth. The system was then composed of i) a microphone, ii) a speaker, iii) a bluetooth chipset, iv) a motion sensor v) a content server. The motion sensor would have avoided the necessity for buttons and allowed the person to control the playing and recording by shaking the shell in a coded way, like a ritual. This configuration was proposed and discussed in a seminar with other colleagues and then assessed using a mock-up and performances in a fictive space<sup>33</sup>.

This early version of the system had a strong poetical power but, on the other hand, was not a practical solution. The main problems were:

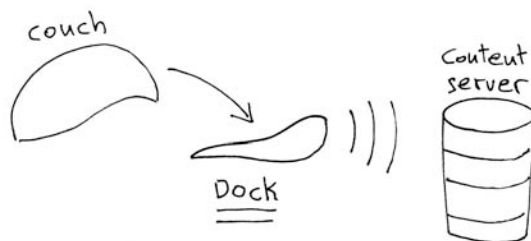
<sup>33</sup> See Appendix II

- How to avoid stealing
- Content management and moderation

The stealing issue was related to the value of the device. It was an expensive and attractive playback system and it was wireless. Different solutions have then been explored to investigate how the desire to steal the components could be minimized. I have become aware that I could not avoid stealing unless accepting to wire the conch to the site or restrict its portability. However, such a solution would be counter to the key qualities required for engaging on-site interaction in the graveyard.

The right approach was not avoiding but considering stealing as a common scenario. In this way, it was clear that using cheaper technology not only would have reduced the likelihood that the seashell was stolen but it would have also made stealing a more acceptable event since the shell could have been easily replaced.

The value of the device was mostly based on the bluetooth chipset that allowed the communication with the content server.



**Fig. 37** The communication between seashell, dock and content server

Since it was not possible to replace it with a wired communication, a second device has been introduced as part of the system: a dock that is linked to the ground and is responsible for the

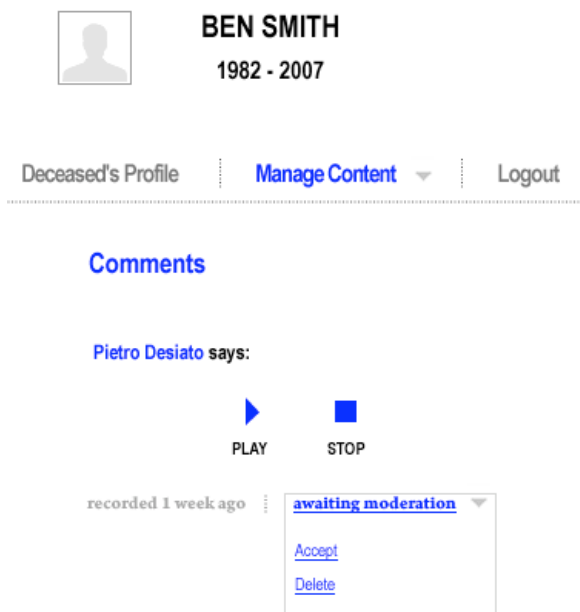
communication with the shell and with content server.

A second issue was raised because of the lack in controlling the recordings and mainly the content. It was quite easy to imagine a scenario where bad or wrong accounts were recorded.

The solution to this problem has been identified in a web interface that allows people to moderate and eventually remove bad accounts and that can also work as web memorial.



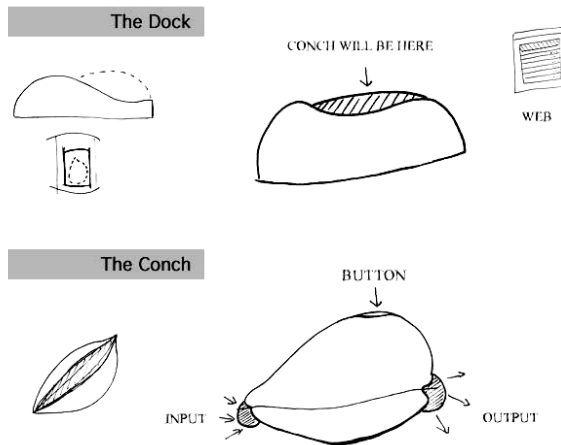
**Fig. 38** The web interface allows the user to manage the content of the seashell but it works also as web memorial



**Fig. 39** All the comments can be moderated and eventually deleted

### 3.7 FINAL DESIGN AND PROTOTYPING

The final system is composed of two electronic devices and a web interface. The first is an interactive audio system that can play and record vocal content thanks to a cheap built-in playback circuit composed of an input device (microphone), an



**Fig. 40** The dock and the seashell

device (microphone), an output device (speaker) and a memory. The circuit is based on an Arduino board and works thanks to Processing programming language.

A button that is coherent with the surface of the external shell has replaced the voice activation system.

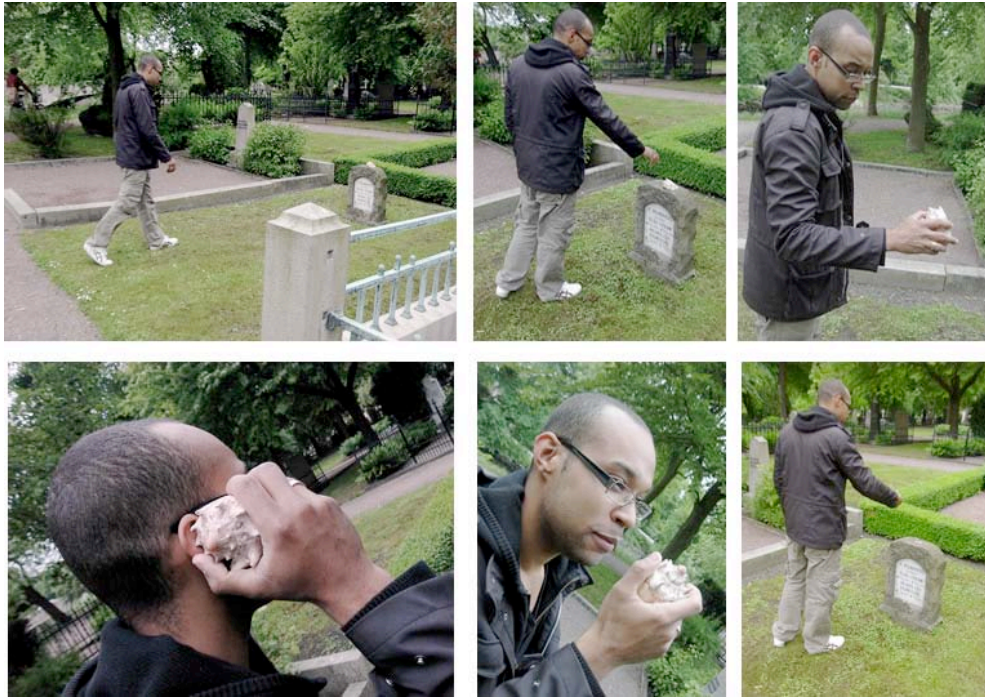
The button makes the system work: once you have picked up the seashell, the pressure of the button let the system start playing the content (the first track will be a biographical introduction about the deceased). A second

pressure will tell the system to skip the track. It controls also the recording activation: holding the button pressed will activate the recording and, after a vocal feedback, the person can decide to store the trace or not, by pressing the button again.



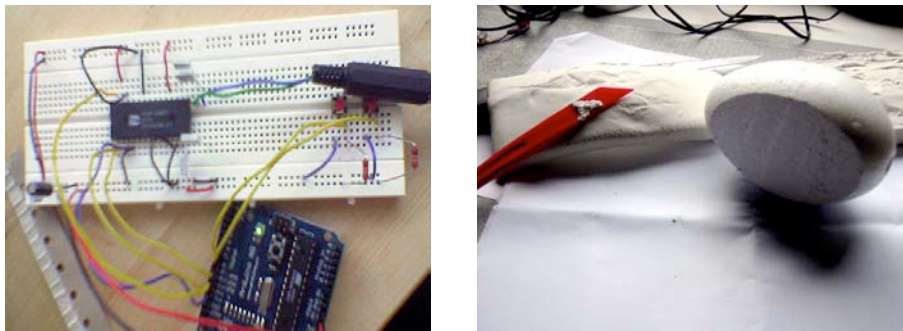
**Fig. 41** The button

The content stored on the seashell is limited to the size of the memory but it is refreshed when the shell is replaced on the dock. Its goal is to randomly refresh the content and download the recorded content that has been temporarily stored in the shell. Once the dock has stored the new traces, it will send them to a database server, which provides and stores the content. The stored content can be then managed through a web interface that will allow the moderation of the contributions.



**Fig. 42-47:** 1. Approaching the grave 2. Picking up the conch 3. Pressing the button and playing 4. Listening to the content 5. Holding the button pressed while recording 6. Leaving

The prototype has been developed using clay as material for the shell. The circuit is based on an Arduino, an open-source physical computing platform whose programming environment is based on Processing.



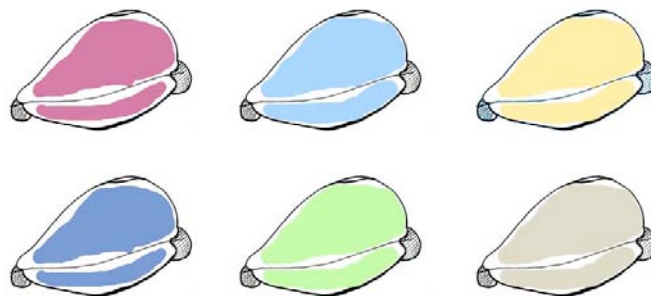
**Fig. 48-49** On the left, playback circuit based on Arduino. On the right, the shell modelled using light clay and polystyrene



**Fig. 50-51** On the left, the fictional grave (Ben Smith) used for the presentation of the project. On the right, the shell modelled using light clay

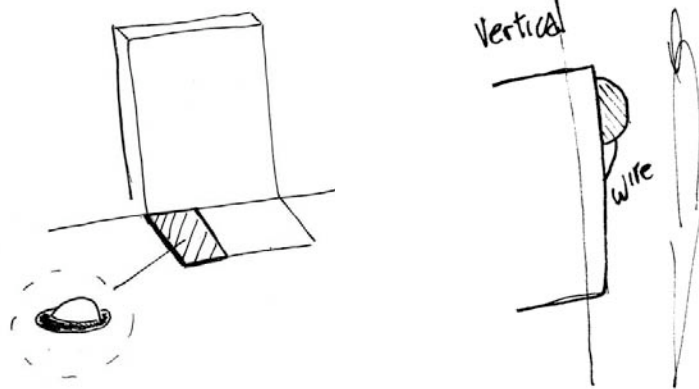
### 3.8 VARIATIONS AND CUSTOMISATIONS

It is clear that in this domain one cannot design a universal solution because of the complexity of the practices and the situations. On one side, it is important to give people the opportunity of making the conch unique in its appearance.



**Fig. 52** An example of customisation

This is mostly an industrial design issue, but it is good to recognise and be aware of this kind of needs. The shells, then, could be different in shape, colour and look, have different text and different surfaces. The customisation is necessary also for the vocal guide that will provide a basic feedback.



**Fig. 53-54** Variations on Horizontal and Vertical Headstones

Design variations are important as well. In this work I have presented a main solution but I am aware that it will not fit all the situations. In the case of a vertical headstone, for instance, the conch could be attached to it through a magnet and be wired so that no dock will be needed. The variety of situations does not allow me to design a system that will suit all of them. What this system can do is adapt to the possibilities. In the end, designing for possibilities is the main goal of an experiential approach.

### 3.9 CONCLUSIONS

In this thesis I explore the domain of the graveyard and investigate its constitutional dimensions. My approach is based on the importance given to experience in the process of the interaction. In this perspective, graveyard is composed of interconnected layers that are constantly subject to change. These dimensions are responsible for the physical, personal and socio-cultural dimensions of the graveyard. They encompass different variables that go beyond the mere physicality of the locale. My analysis discusses the different meanings of the considered domain and suggests more than one way of designing for experience in the graveyard.

The very design phase focuses on the practices of memory, which represents the prime interface between bereaved and deceased. In doing so, this work outlines and considers various alternatives that stretch the problem in different directions. After an initial exploration, I define a main concept and style of interaction. The following process is systematic but iterative. For

instance, new requirements are found during the concept phase such as feasibility and portability. The final design is the result not only of the proper design process but also of choices and trade-offs, like the decision of rethinking the components of the system in order to make it disposable and more practical. In the end, a physical prototype of the system is developed. Even if more tests and assessments would be needed, it represents this work and its findings in a satisfactory way.

Compared to the projects that at some degree deal with the same domain, this one focuses more on people and experience rather than on technology. This does not mean that technical aspects are underestimated. On the contrary, the pursuit of simplicity and naturalness is essential and represents the importance this work attributes to the technological impact on the interaction and on the existing context.

The way the domain is approached can give rise to some critiques related to the validity of humanistic geography and of Tuan's account. His framework presents some objectionable points related to the way materiality and the elements of place are considered. Probably, this work lacks in considering more critical perspectives on space that take into account not only its dimensions but also the processes according to which space constantly changes (Björgvinsson, 2007). Anyhow, from a design perspective Tuan's account is able to enrich and guide the process towards a better understanding of the experience of place.

The next step will hopefully be a wider investigation of space, even from the point of view of architecture, which is obviously an important field to take into consideration. Moreover, I want to explore more the literature related to burial practices as well as the activities that surround the event of death. In doing so, the design process would get a better and more complete view on what interaction in the graveyard is and identify new ideas and solutions.

# APPENDIX I

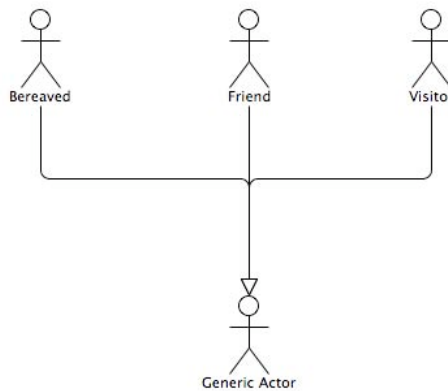
## UML Diagrams

## USE CASES

Use cases are a representation of the system from the point of view of the user. They do not specify how the system will be implemented but offer:

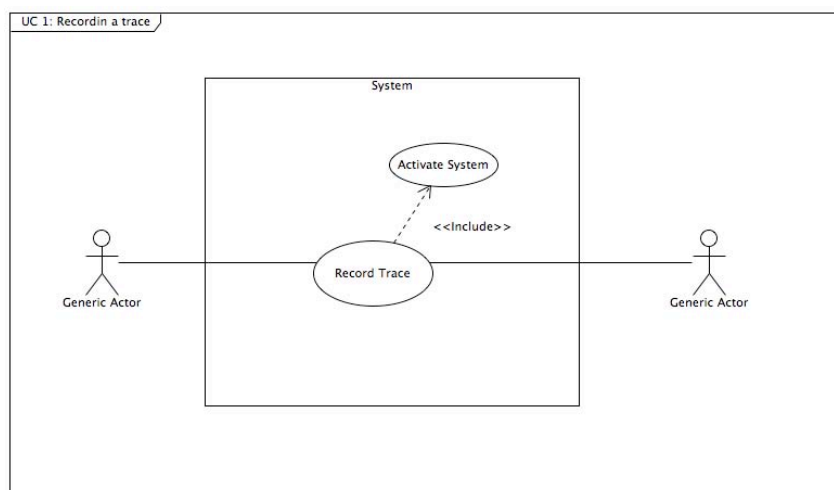
“An implementation-independent view of what a system is supposed to do and allow the modeller to focus on user needs rather than realization details” (Pitone and Pitman, 2005:23).

Here I will define the main use cases that can be deduced from the scenario. The actor will be, then, a generic person without any privileges or specifications.



**Fig. 55** Actors

The first use case (UC 1) can be deduced from the first part of the scenario and concerns the activity of input and recording the trace.

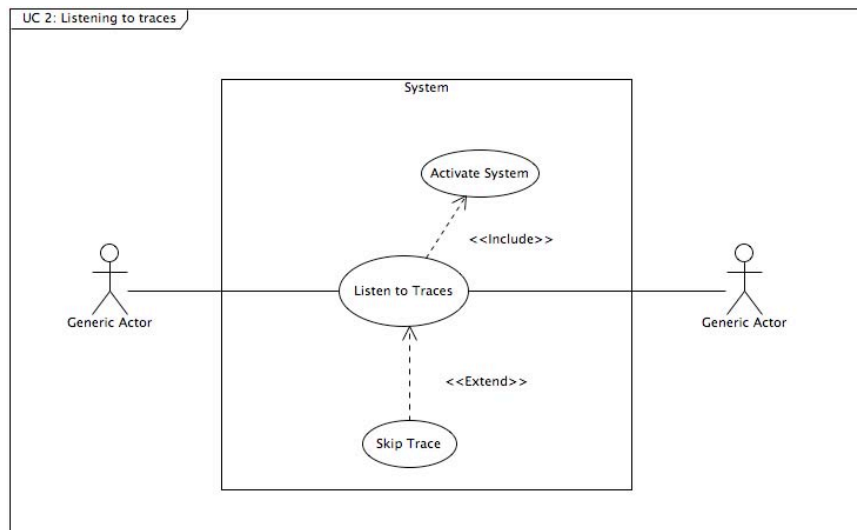


**Fig. 56** Use Case 1: Recording

The figure shows the ‘Input’ use case where there is a main case that identifies the recording scenario and an included one that identifies the activation of the recording system.

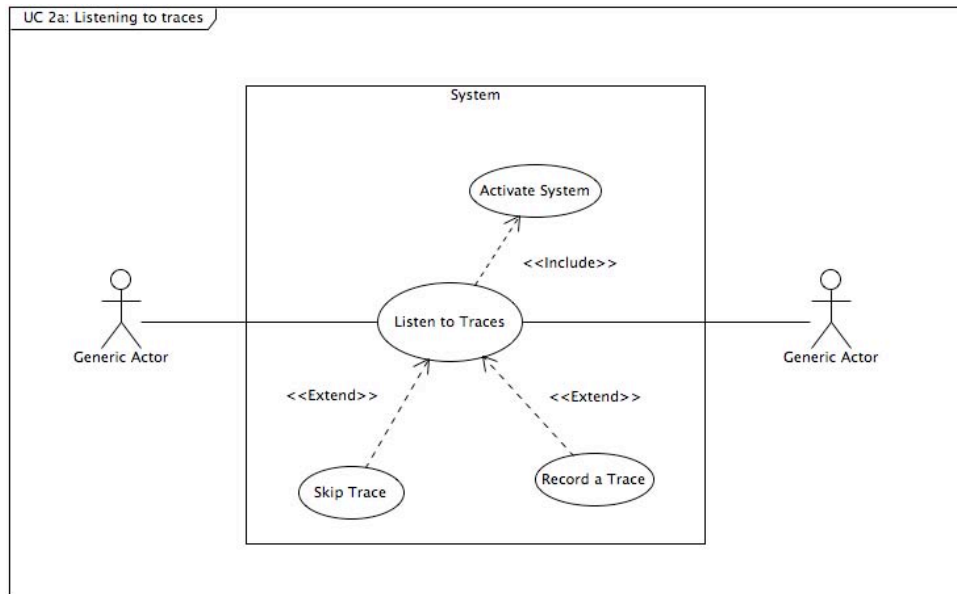
The second use case (UC 2) concerns the output and listening activity that will happen in the context of the graveyard as illustrated in the last part of the reference scenario. The actor is still a generic person without any privileges.

Before the actor can actually listen to the traces, she has to activate the system providing an input. Moreover, the person may want to skip the trace and go for another one. The second use case will then be:



**Fig. 57** Use Case 2: Listening

A third case concerns the possibility of recording a trace while listening. The only difference with UC 1 is the context since the activities to record a trace are the same. So we can just update the UC 2 with a new included sub-case.



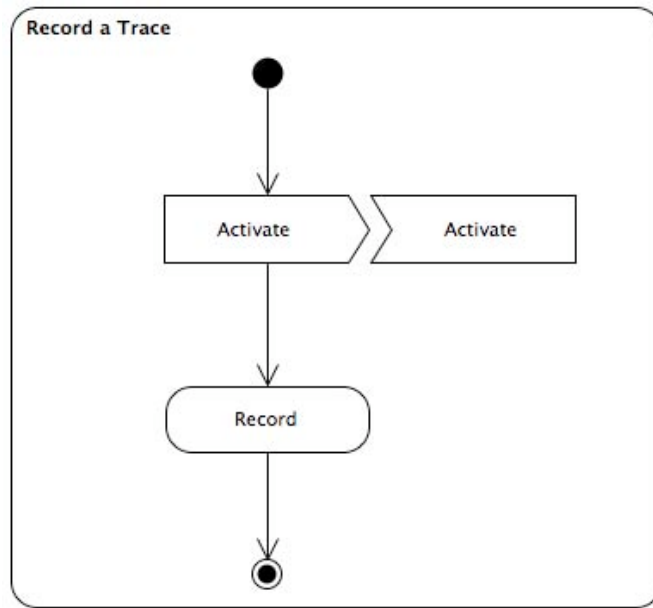
**Fig. 58** Use Case 2a

Use cases offer a clear view of the system from an external perspective. They treat the system as a ‘black box’ without giving information about the implementations and the components that should be inside it. In the next sections I will detail the dynamic part of the system with activity, statechart and sequence diagrams. Then I will describe the components needed and document the assessment done.

## ACTIVITY DIAGRAMS

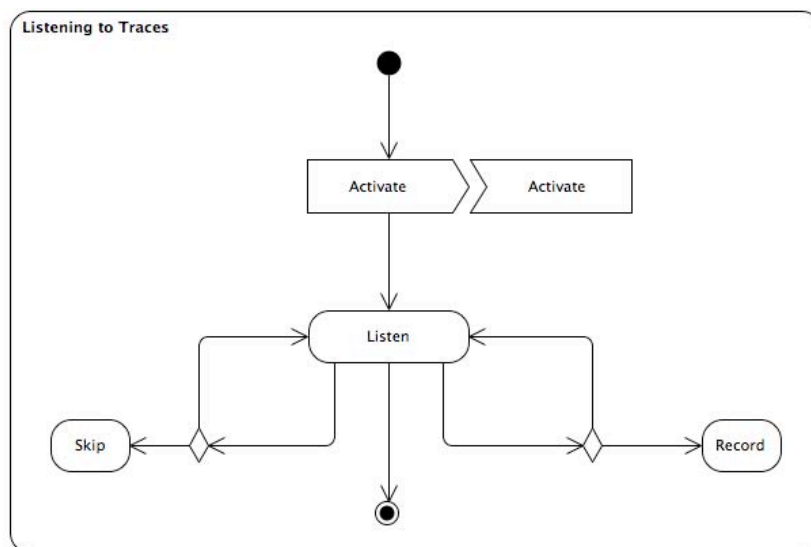
In this paragraph I will use activity diagrams to define the dynamic part of the system, detailing the activities the actor is supposed to perform. These diagrams focus on the execution and flow of the behaviour of a system (Pitone and Pitman, 2005).

From the input use case (UC 1) we can deduce that one of the main activities is recording a trace. This can be performed only after the system has received the related input. So the *activity* of recording is composed of two main *actions* that are ‘activating’ and ‘recording’. We can assume that the system will be activated by an input signal. The diagram will then look like this:



**Fig. 59** Activity Diagram (Recording)

About the second use case (UC 2) we can identify two main actions the listening activity is composed of: activating the system and skipping a trace. Moreover, there is the possibility to record a trace on-site. The second activity diagram will then be:



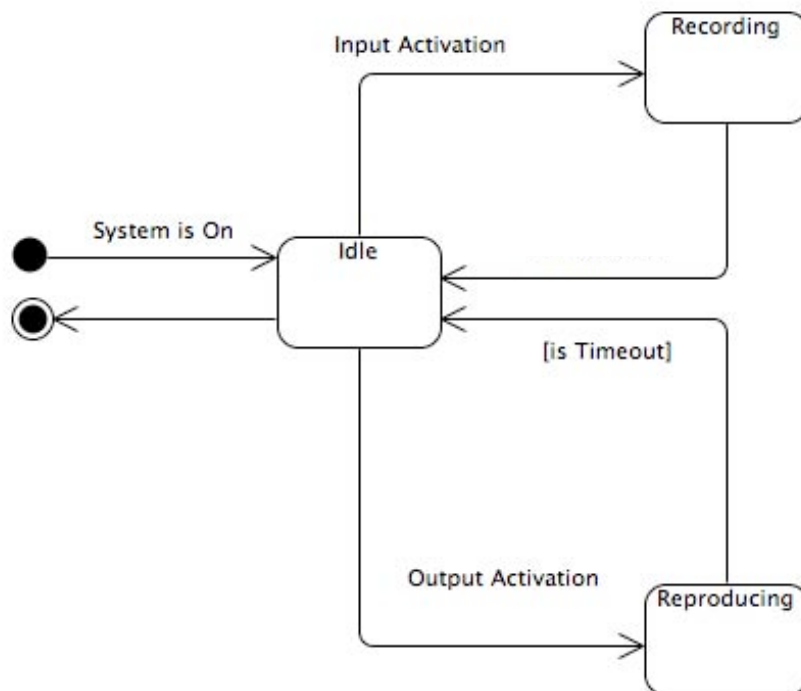
**Fig. 60** Activity Diagram (Listening)

## STATECHART DIAGRAM

Now that we have a better understanding of the activities, we need to open the ‘black box’ and capture the behaviour of the system in terms of change in its states.

In both use cases, the system starts from an ‘Idle’ state. When the system is idle it is just waiting for inputs. The transition to a different state can happen because of the activation of the recording or of the output. In the first case, the system will go into a ‘Recording’ state; it will store the input and then return to the ‘Idle’. So there are two states and two transitions.

In the second case, the next state will be the ‘Playing\Reproducing’ one. After that, the system will return to the ‘Idle’ state if nothing happens. If there is another trigger instead, it will go back to the ‘Playing\Reproducing’ state. The diagram, then, will look like this:



**Fig. 61** Statechart Diagram

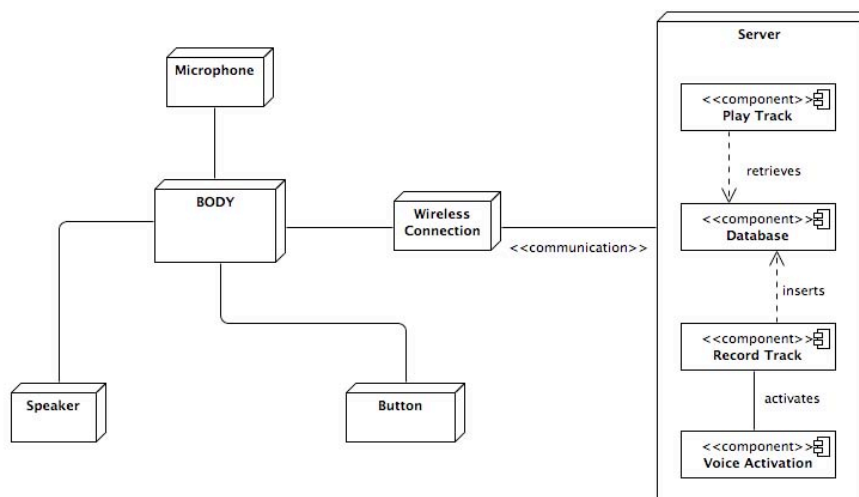
## DEPLOYMENT DIAGRAM

We are now able to identify the hardware components needed and to detail their relations and tasks. The defined setup takes in consideration the previous requirements plus the outcomes from the above diagrams. Note: this configuration is the result of the assessment outcomes

In the previous paragraph, we have defined the use cases, the activities and the behaviour of the system. Now we need to summarize what the system will effectively do, its functions, and model its components. Here is a list of the functions and the related components:

- Recording vocal traces (input)  
**Microphone**
- Playing traces (output)  
**Speaker**
- Control playing and recording  
**Button**
- Storing traces  
**Database**

A **wireless connection** and a **server** are needed as well to satisfy the portability requirement.



**Fig. 62** Deployment Diagram (v.1)

A low-cost configuration that introduces a dock whose functions are the communication with the recording device and the database server as well has replaced this first setup. Moreover, a web interface has been introduced to manage the stored content.

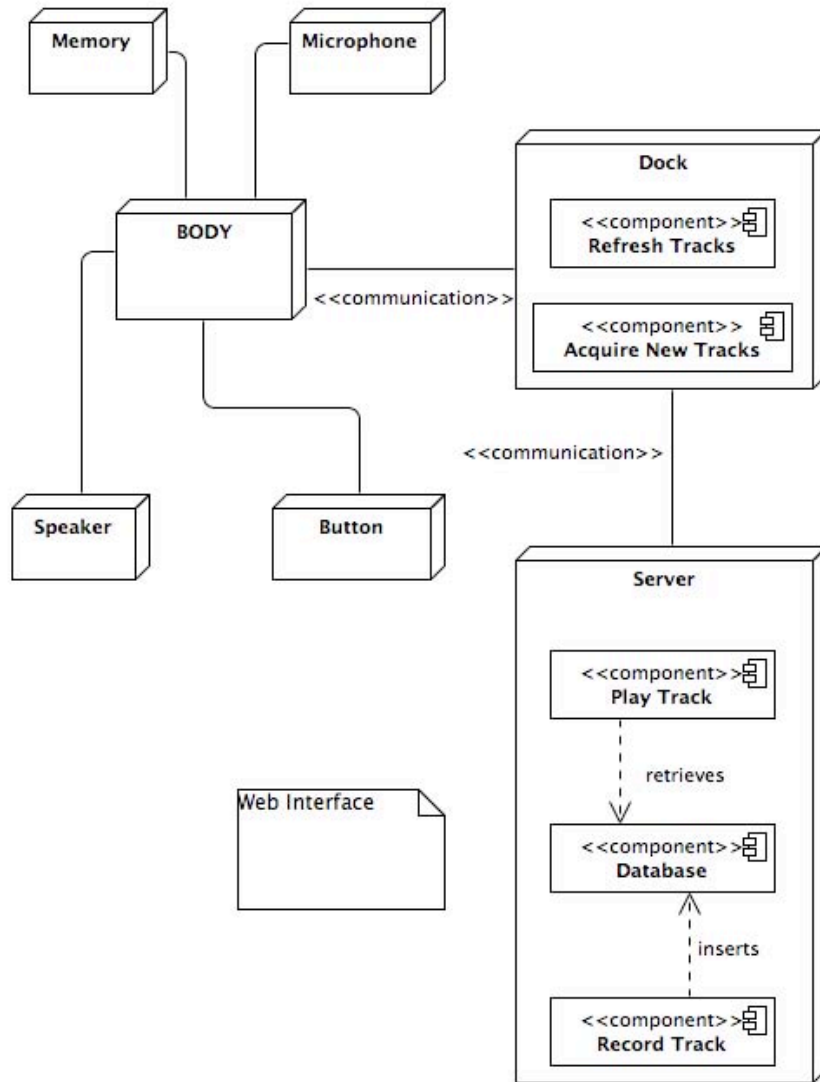
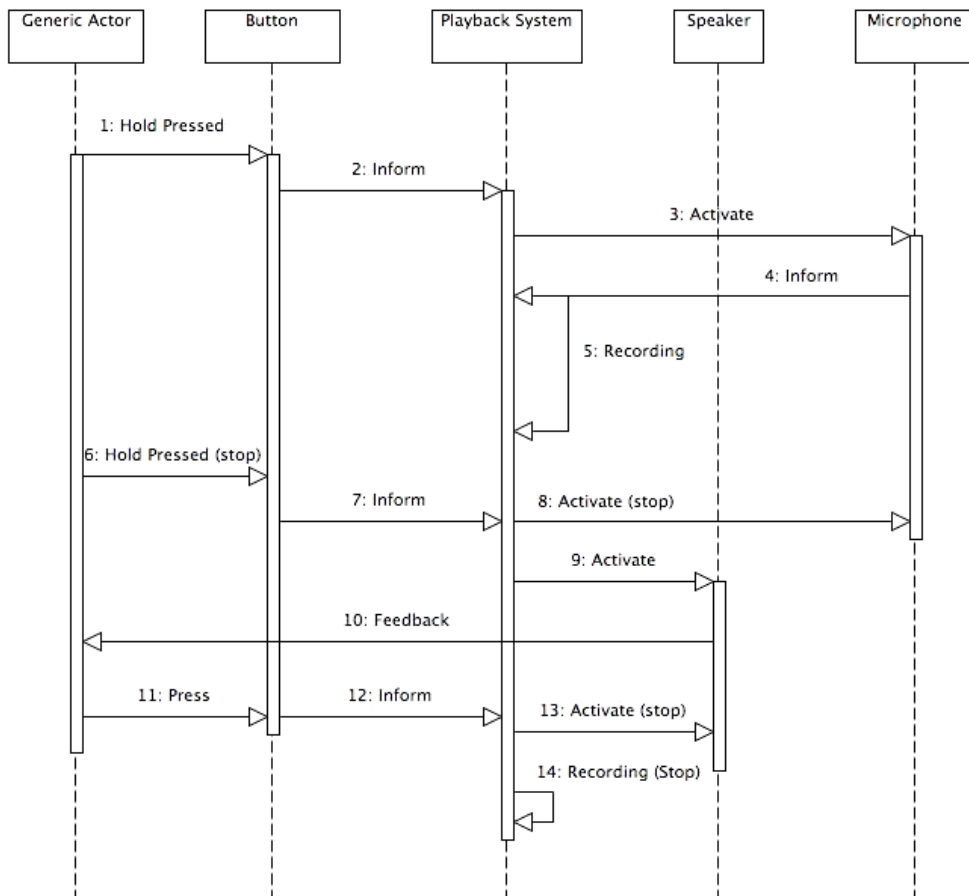


Fig. 63 Deployment Diagram (final)

## THE INPUT

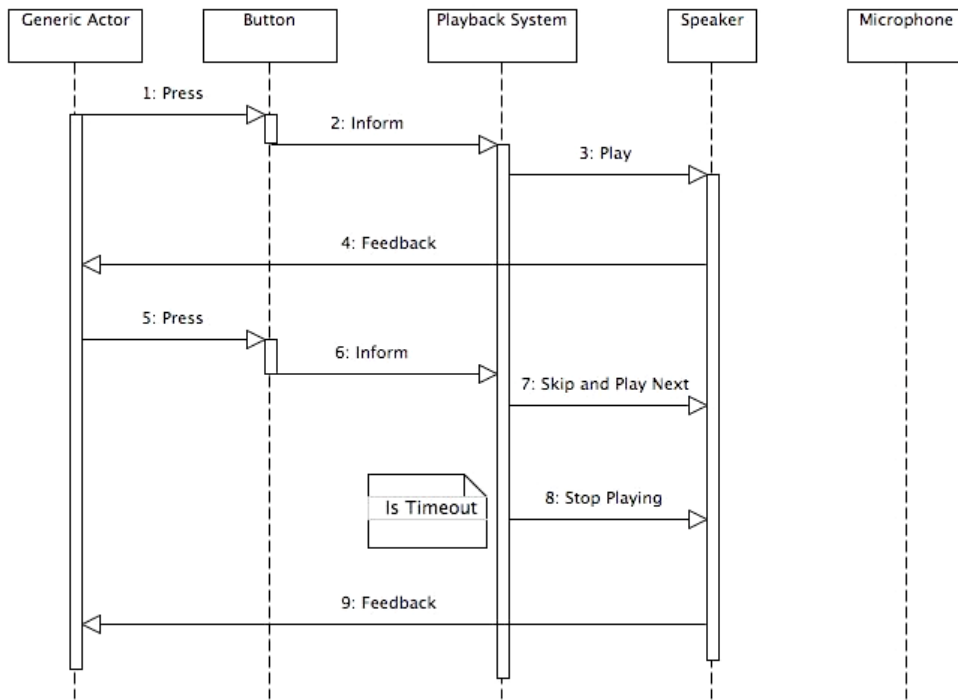
The recording is based on a playback circuit that is integrated in the recording device. The recording function is activated when and until when the button is held pressed. Once a trace is recorded, the system plays it as feedback. The person will then confirm the recording by pressing the button.



**Fig. 64** Sequence Diagram: Input

## THE OUTPUT

The output is based on a speaker and the input received from the button. When the person presses the button, the system starts playing. The next button inputs will perform a skip of the trace.



**Fig. 65** Sequence Diagram: Output

# APPENDIX II

## Assessment

## ASSESSMENT

The assessment session has been conducted in two different spaces to evaluate the practices, contexts and the interactions of two different scenarios: the recording and the retrieval of the content

The person involved in the session were:

- A 58-year-old man working as doctor, father of two sons and with a high-level education;
- A 49-year-old woman, housewife in a mid-class family and with a mid-level education;
- An approximately 70-year-old lady who suffered the loss of her husband and was living alone;
- A 23-year-old student living with his college colleagues in a shared apartment;
- A married couple composed of a 45-year-old husband and a 40-year-old wife. They were both full time professional workers in different studios and spent little time at home.

The first phase aimed to evaluate the “filling” of the shell in terms of content and context. It has been conducted around a table with a mock-up of the product. Persons were asked to role-play the days after the death of a



**Fig. 66** Mock-up

loved person having in mind the possibility to use the seashell. Before the discussion, they were introduced to the project. I’ve been sitting with them around the table and taking notes of the discussion.

The second phase was focused on the retrieval and has been conducted in fictional space that was composed of a small table where I put picture, a flower, an empty box, some candles and the shell.

Then people were asked to simulate an interaction with the grave in the traditional way and with the seashell. This phase aimed to assess the way people interact and the quality of the product.



**Fig. 67** The fictional grave

The results of the tests were interesting and useful for the design. Here is a summary of the findings:

- About the context and the moment: after some discussions, people agreed that the best moment to fill the shell would be the one the family uses to make decisions about the headstone and the whole grave. This usually happens some weeks after the death.
- About the content: there should be a biographical part as default. This should tell about the deceased, who she was and what she has done in her life. Telling the biography in first person with the deceased's own voice would be too much poignant: they prefer to have a third-person story told by a "neutral" voice, maybe a professional that they can choose. Sometimes the passed away could have thought about it before his death and could have given some directions like what he would like to be told in the story.
- About the contributions: it could be quite hard to leave a spontaneous contribution. There should be some *inspirations* from which the person could start or get inspired. Some sorts of templates are already used when the family writes the funeral banner.
- About the physicality and the interface: the system should be versatile and become part of the default adornments like lights and

picture frames. The design should take into account the different architectural solution present in the graveyard so that the shell could fit every situation. This could be done with a magnet or by deciding a dedicated spot. Moreover, it has to be protected from the weather: there could be a hole in the headstone or a little roof.

- About the experience: the shell has been appreciated for its capability of offering a support for the experience. People said that they would use it to discover their past by knowing their progenitors, for instance. The father told that it would be great to make his children know old relatives that he doesn't know either. He said that the shell 'breaches your soul'.
- About input and output: people agreed on the output but they had a long discussion about the input. On one side, having the possibility to leave a message would be a powerful experience. On the other side, there could be some issues related to bad accounts. Then the discussion went on and another interesting point came out: the seashell could be a communication centre that mediates between relatives that do not speak to each other. The father's grave, for instance, could be the means to make brothers communicate. In the end of the discussion, a part of them agreed that there should be only an output to avoid this kind of problems. Others said that there could be an input but it should be private and only the family should be able to hear the contributions, thanks to an access code. However, the bad accounts could be addressed to other family members. This issue has been addressed like important in the beginning but after some reflections people agreed that this could happen with everything, mailbox or phone. Even if this is true, I underlined that people would accept the risk only if the usefulness is greater than the drawbacks.

## MID-WAY SEMINAR

The concept has been discussed and assessed during a focus group with my colleagues too. The seminar aimed to share our critique and observations about the other projects. The discussion has been really interesting and the concept seemed to be welcome by most of the participants. Fortunately, some good critical points emerged as well.

*Problem one:* The first weakness of the concept is a usability issue related to the recording. A border-line case, as addressed by my counterpart, is “what if I record my memory but with the wrong name?” This is a very important point and obviously cannot be ignored. However, it is quite evident the whole interface needs a content manager so that contributions can be managed and moderated.

Another problem was a security issue related to the fact that a bluetooth device is expensive shell could be stolen. This is another evident issue that I had faced before but that I wanted to be discussed during the seminar. In the end, it came out that this concept could develop into two different directions that are the “artistic” and the “practical” one. An artistic solution has a strong communicative power and could make people reflect on their relations with the deceased and on the importance of memories. Its strength would be in the poetic power of the seashell and of its natural interaction. Anyhow, the concept was not practical and feasible because of the problems above. I really liked the possibility of going for the artistic solution because this kind of concepts is very capable of communicating something. But, as I’ve stated before, one of my main goals was making the concept feasible since a valid and practicable solution is something more than a fascinating artistic concept. Artistic concepts are tools for exploring society and the world we live in, but practical solutions are attempts to make them better.

At this point, I have been forced to look for some trade-offs that would have preserved the key qualities of my initial design but at the same time would have made it more practical. There were different possibilities to “practicalise” my concept but most of them seemed to ruin the entire idea. What I wanted to do was re-design my concept and keeping its key qualities. The questions were, then, how to make the seashell more practical

and how to avoid stealing.

One of the possible solutions seemed to be a wire. This solution would have reduced the value of the seashell but the shell would have lost its qualities as well. As I describe in the last chapter, I have introduced a second device that is responsible for the communication with the database server. In doing so, the value and the cost of the shell have been reduced and stealing has become a minor problem.

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