

NADIA HESSELLUND UTZON nhu@itu.dk KIRSTINE SOMMER KJÆRGAARD ksom@itu.dk ANDREAS WIBERG SODE anws@itu.dk TOM BUHL LARSEN tbuh@itu.dk EMILIE HENRIETTE HOLM eheh@itu.dk

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ABSTRACT

The following report describes our iterative design process from our first brainstorm, the conducted fieldwork, the sketching face, our video creation, the prototyping, to the final exhibition of our design. The development of our final interaction design concept, BottleSpot, has been divided into three themes. In the first phase of the process, we have through different field work methods explored written communication in order to find opportunities for interaction. The insights from the field work lead to an opportunity statement used for inspiration in the following design process. Secondly, by means of idea generation and sketching techniques we formed three concepts which were presented at the Mid-Crit session. The features from each of these concepts were then evaluated and the best merged into one final concept. In the third and final phase of the design process, prototyping and user testing were used to polish and refine the concept. Additionally, this phase was used to evaluate the choices taken throughout the entire design process in order to end up with a tangible solution.



INTRODUCTION

Reading and writing have long been a part of human history. From simple symbols left in caves to the complexity of today's modern alphabet, humans have communicated through messages. Before the discovery of telecommunication, writing was by nature a slow form of communication. Today most written personal communication has turned digital with communication forms such as Messenger, email and Snapchat, the latter more and more instant in its form. Many of these communication forms are now linked to digital artifacts that people carries with them, making them always "within reach" wherever they are. By reflecting upon this availability we have taken 'a step back' and explored ways to combine the analog and the digital world.



1. SETTING THE PROBLEM

1.1 Choosing a focus

The overall task for this semester's interaction design course was to design a new digital solution on the topic of Reading and Writing. Reading and writing are very integrated social practices in modern society today and we therefore began our design process with discussing different reading and writing settings in everyday life. We categorized our thoughts to specific situations involving people and artifacts. By means of brainstorming we tried to produce as many ideas as possible, with a focus on our own memories of situations with the use of reading and writing.

In the beginning of the brainstorm we tried to find "problems to be solved" within society, but soon found that this approach limited our creative thinking process. We therefore tried to be more openminded and changed our focus to people's experiences with writing and reading. As a way of narrowing our focus we chose only to be concerned with written messages.

Technical artifacts are highly interconnected with people and the way they live their lives. When designing a new digital solution, we therefore needed to explore the everyday realities that we were designing for (Löwgren & Stolterman, 2007). We found the difference between digital and analogue communication forms interesting and in our fieldwork we wanted to take a look at the way people make use of and feel about written messages - both digital and analogue.

1.2 Fieldwork

The selection of appropriate methodologies was crucial in our attempt to get as many useful insights from our fieldwork as possible. We chose to make use of semistructured interviews because of this qualitative method being essential in understanding people's perspective on different situations (Blomberg et al., 2003). Recording the answers from the informants also allowed us to examine and conduct a deeper analysis of the findings from the fieldwork.

We reflected upon former analogue ways of communicating, and found the 'mindset' and the act of sending a message in a bottle interesting. Because of it being a very slow way of communicating, it differs a lot from current written communication forms. We chose to conduct homemade messages in bottles to friends and family to get an understanding of people's reaction to this unexpected way of receiving a message. We considered this method as a form of probe, because it allowed us to interact with the participants without dominating or influencing their actions, and without them being aware of our intentions with it. While not being actual cultural probes, these messages in bottles still provided us with some inspirational thoughts and insights (Gaver et al, 1999).

The tricky part during the fieldwork phase was how our focus did not concern a specific social situation but the individual experience of conducting and receiving written messages. We chose our target group to be people no younger than 18 years old, because we wanted the informants to be able to reflect upon their experiences with their use of different communication media.

The following are some of the main aspects we examined in our fieldwork:

- In what ways do people conduct and feel about written messages today?
- How do people feel about analog messages as opposed to digital messages?
- Do the time aspect has any influence?

Based on the mentioned aspects to be explored, we formed a research statement that clearly stated what we wanted to achieve from our fieldwork:

We want to examine and compare the way people conduct and receive personal written messages - both digital and analogue.

Our fieldwork consisted of two phases, where the first round of interviews provided the basis for a new and more defined research question for the last round of interviews: We want to study how (if any) the time aspect influences the digital written communication between young Danes in different media.

The questions in our second round of interviews were more concerned with if the time aspect (the answering time and the fact that people mostly know if their message has been read etc.) had a notable influence on the way the informants conducted and felt about their written messages.

The collected data was analysed and summed up into the most important insights for our further work.

1.3 Insights from fieldwork

The list below illustrates some of the most central insights from our fieldwork:

Interviews:

- All the informants often use digital media (SMS, Facebook, Messenger, Snapchat) when conducting written messages.
- The time aspect has a big influence on the digital written communication, because it often stresses the sender or can make the receiver feel guilty for not answering back "in time".
- Instant digital communication forms are not necessarily less personal than analogue communication forms. E.g. some informants regarded Snapchat as a very personal way to communicate.

'Message in a bottle-experiment:

- All the informants were overwhelmed and touched by this unexpected message where the sender has put effort and time in writing it.
- None of the informants wanted to spent too much time in conducting a written message but liked to receive a message where the content is thoughtful in its nature.
- The excitement of finding a personal message on a specific location made the message very valuable.



Especially, we found one of the informant's (Mette Wallach) reaction to 'the message in a bottle experiment' useful for our further work. Mette's immediate reaction was to answer back by sending a Snapchat showing her gratitude to the sender. Afterwards, she reflected upon her answer and felt bad about not putting enough effort in it, because she found the message being of much more value to her than 'a simple snap'. She also felt a bit stressed by the fact that she got home late that day, which could had resulted in the sender getting disappointed by her late answer.

The fieldwork indicated how the response time has a big impact on the informant's way of sending and receiving messages. The written communication forms available today "do not provide good support for managing unavailability and inattention" (Birnholtz, Hancock, Smith, Reynolds, 2012). Based on the insights, we reflected upon introducing a 'slow message concept' within our own design solution. To narrow our perspective, three key points were chosen: *Slow message, location* and *unexpectedness*. We reflected upon new forms of availability regarding the use of our design, which lead us to the following opportunity statement: How may we design a frame for written messages which is intuitive and simple to use without the expectations of an immediate response?

2. GETTING THE RIGHT DESIGN

2.1 Ideation and Sketching Process

With the opportunity statement in hand, our design process had reached a point where it was time to think in solutions. We started off with looking for interactions within the design space and what these might mean for the concept we were planning to create (Buxton, 2010). We discussed different physical framings, what kind of people and artifacts could be involved, the situations and the context of use. Buxton's concepts of divergence and convergence were used in the process, to open the design space and to specify the ideas developed from the opportunity statement.

At this point, our design solution could be anything from a smartphone to a spot on a sidewalk. At this stage in the process, we did not yet know what kind of demands our potential users would have to our design concept. Instead, we focused on creating the best possible settings for the communication, allowing the users to define the content.

Based on the insights from the fieldwork, we considered how much effort the potential users were willing to put into creating a message. We also considered how we could prevent the receiver from feeling obligated to answer back. As most written communication today is available on smartphones and computers, we considered the availability of the message. Inspired by the 'message in a bottle experiment', we thought of the possibility of attaching a message to a physical location and thereby creating a *private space* within a *public setting*. By limiting the receiver's possibility to receive the message, we hoped to create an element of surprise for the receiver. We decided to focus on one-to-one communication, as the insights from our fieldwork showed how this was the most commonly used form of communication.

With this in mind we moved on to sketching and getting ideas down on paper. In this process we explored and questioned the opportunity statement and the insights from the fieldwork (Buxton, 2010). In order to get the most out of this process, a group sketching session was used as a tool for boosting our creativity and to inspire each other. This method gave us the opportunity to draw on each other's sketches which created new concept ideas. Three of these ideas were chosen.



2.2 Mid Crit

The ideation and sketching process lead us to three design concepts to be presented for the Mid-Crit. The first concept, Personal Spaces in Public Places, focused on the surprise of receiving an unexpected message. It was presented as an app, where messages were placed on different locations using GPS. The second concept, Digital Bottle Message Network, was an online forum where the participating users were able to follow the journey of a physical message in a bottle around the world. The last concept, LookUp, was presented as a 'good night-message-app', that allowed the user to write and attach a personal message for someone in the stars.

The feedback from the Mid-Crit highlighted how the slow message aspect in all our concepts as a strength. The users having to "unlock" a message on location was also seen as an interesting aspect for the further development of our design concept.

2.3 Moving from three concepts to one

Based on the feedback from the Mid-Crit we discussed the possibilities and limitations within the three concepts in order to find the strongest features for our final concept. We chose to continue with a slightly changed version of our first concept, *Personal Spaces In Public Spaces*, and integrated the best features from the other two concepts.

Slow message:

The slow message feature is what differentiates our design from most known digital forms of written communications. People will only receive the message at the right location with their phone, which eliminates the aspect of response time.

Location:

The location feature allows the users to attach messages to a specific location using GPS. In this way, the surroundings are actively combined with the message and the receiver has to interpret it in context to a particular spot.

Unexpectedness:

The receiver does not get any notification before entering the location, where the message has been placed. With this we have implemented an unexpected element into our design concept. Additionally, the receiver can not see who the message is from before "unlocking" it - much like finding a message in a bottle.

2.4 Important choices and limitations

Based on the insights regarding people feeling pressured to answer back, we decided that the sender would not get any notification when the message is received. Through the notion of serendipity, not knowing when, or if the message will be read by the receiver, we prevent the time aspect from being an influence on what is written. This functions as one-way communication with no obligations to respond immediately.

As the app makes use of GPS, we reflected upon the ethical aspects of this technology. By not receiving any notification the sender will not be able to use the app to track the receiver at a certain location.

We find it likely that the sender will place the message on a location where the receiver is expected to walk by in a near future. Despite of this, we chose to set a time limit for how long it is possible to find the message. Some messages may be irrelevant after a given time, which is why we wanted to allow the sender to chose how long the message should be available.

We also decided on implementing a function where the sender is able to place the message within a certain radius. By this, the message can be placed on both smaller and larger locations.

3. GETTING THE DESIGN RIGHT

3.1 Prototyping

In the phase of *Cetting the Design Right*, we chose to integrate more interaction in our final concept. Instead of only receiving a notification, we wanted our design concept to foster more bodily interaction, something that was originally included in the *Look Up* concept. Therefore we implemented an active element, where the receiver needs to scan the surroundings in order to find the hidden message. By this, the act of receiving the message is done in a more active way instead of just looking down on a screen. Bodily engagement with physical and virtual environments is an important aspect of cognitive work, like when people leave notes for themselves on strategic positions (Klemmer et al., 2006). The receiver has to stop up and use the body to find the message.

An important part of the phase of *Getting the Design Right* was conducting a prototype for our design concept. In the prototyping phase we got a more concrete understanding of the functions of our design. Rather than just *thinking the idea through*, prototyping enabled us to *work it through*. This kind of backtalk from reality helped us to uncover possibilities as well as limitations within the design concept (Houde, S., and Hill, C., 1997).

The prototype consisted of a "smartphone" made out of cardboard with a green bottle in the middle. We wanted the informants using the prototype to be able to get a sense of scanning the environment and to illustrate the message in a bottle appearing, when scanning the right spot.

Prototyping - first draft..





3.2 User Testing 1.0

In an attempt to get a better understanding of the potential user's *experiences* with our design, we wanted to explore our design being acted out by putting the design into peoples life.

We chose to test our prototype on the actor from our video because of him already "being in character". He needed to imagine a specific situation where he would use our design. We found that the actor had no difficulties imagining how the design would work both technologically and practically. He found the idea of leaving a message on a specific location as an exciting new way of communicating, because of the unexpected element when finding the message. In general, the creating of the video helped us reflect upon our design being used in the everyday life.



3.3 User Testing 2.0

After the video shoot, we conducted some 'in situation interviews' with some of the same informants from our previous fieldwork. The informants were asked to choose a spot, where they would use of our design. Most of them chose a spot where they had a shared memory with the receiver (friend, girlfriend, family). The prototyping phase uncovered three categories, where the informants would use our design:

- Using the surroundings for messages to surprise the receiver or evoke some kind of emotion. Some of the informants would like the opportunity to add a song or video to the message to make it even more personal.
- One informant would use the app for practical purposes. She would e.g. leave a message within a certain radius of her house, saying: "Hey, remember to walk the dog!" Her children would then get reminded of their duties the moment they came home from school.
- Some of the informants would use the app just for fun, leaving jokes or silly messages for friends and family.

During our exhibition, a fellow student pointed out how he would use the app for communicating with his ex-girlfriend. They do not talk any more, but they have a lot of shared memories on different spots in Copenhagen. Instead of texting her, he would use our app because he finds it less "up-front". The ex-girlfriend does (purposely) not receive it right away and she does not have to answer back.

The feedback from the user tests gave us a glimpse of what kind of messages the potential users would write by means of our design. As shown, the informants had very different approaches regarding the framing of the content and in which situations they would use it. They were all very fond of the surprising aspect of attaching the message to a specific location for the receiver to find. Some of informations expressed how they would like the opportunity to personalise their messages. Depending on the situation they would write both short and long messages and they would use the app for messages to be found in the distant future or to surprise someone e.g. on their anniversary.



3.4 BottleSpot in action

Our final design is an app named *BottleSpot*, which combines the elements of location and the feeling of sending a message in a bottle. Technologically, the app makes use of GPS and the logo of the app illustrates a message in a bottle. To use the app, both the sender and the receiver are required to have installed the app on their smartphone.

Based on the user tests we added the possibility of personalising the framing of the message. When writing the message, the sender will be presented with a basic style sheet where he can choose between different paper and font styles. The messages can consist of both short and long content. Depending on how much effort the sender wants to put in personalising the message, he can attach pictures, videos and music to the message.

By holding up the phone, the sender chooses a specific spot in the surroundings and places the message on a coordinate by pressing on the screen. The sender now writes and attaches the message and registreres the receiver's phone number. The sender can set a specific radius to place the message within as well as an expiration date on the availability of the message. When the message is sent, an animation will appear on the screen showing a piece of paper being rolled together and fly inside a bottle which ends up disappearing. When the receiver enters the right location, a notification will illustrate that the phone number is registered and that a message has been received. The receiver then scans the environment and when pointing the phone towards the right coordinate, a bottle appears on the screen. When pressing the bottle the content of the message is unlocked.



3.5 Reflections on the final design

Based on our insights stating how people do not want to spend too much time writing a message but at the same time like to receive a special made message, we had to consider how to motivate the sender. Because we are designing an app for a smartphone we can count on the potential user's previous experiences with this artifact. Also, we made the app easy to use by including only a few functional steps when writing the message. We also reflected upon how the gratification of giving without expecting anything in return - like when giving someone a present or sending a message in a bottle - also should work as a motivational factor for the sender.

4. CONCLUSION

With our final design concept, BottleSpot, we have created a space for new ways of interacting by means of people's use of their surroundings. Our final design is based on the key words: slow message, location and unexpectedness, formed from our fieldwork. These draw on people's experiences with and relation to the unexpected experience of finding a message in a bottle. Though, more design iterations could have been useful for a further development of the app. New user tests could have been used to encounter new possibilities for interaction within our final design.

We have created a final design solution for written communication which establishes a particular experience when receiving a written message. We consider this communication form to be used in a number of ways - whether it is to leave a surprising message for loved ones, leaving practical information for work colleagues or sending funny jokes to school buddies.

We consider our location-based message as the trademark of our design, as it differs from current written communication forms. The slow-message concept eliminates a potential pressure of feeling obligated to answer because of its one way and non-committal nature.

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