

# **Far Far Away... To help expats feel more at home abroad**

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## THE PRODUCT

**Hang it on your phone and keep easily in contact with your friend abroad! Make his time abroad easier in this simple way.**



“It was very nice and unexpected to receive those messages from my friend at home, usually I don't get messages from her without a reason.”

“I wouldn't have send the message to the expat without the reminder, it turned out to be quite convenient that I did”

“I liked the reminders, now I didn't have to think about sending a message myself.”

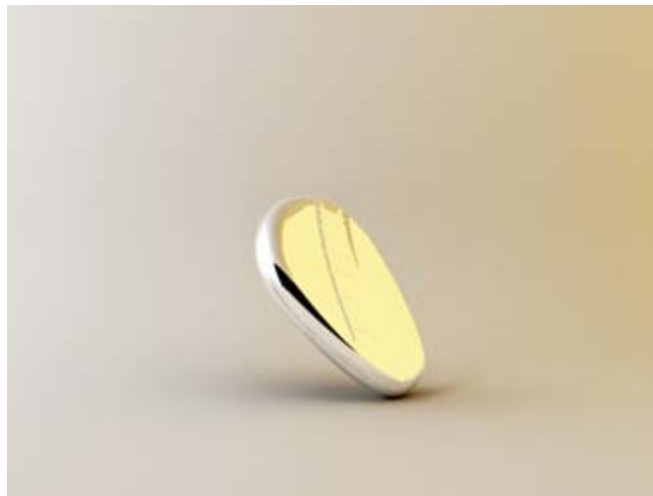
“It gave me a good feeling that I thought about the expat, though actually it was the reminder.”

- Let expat remind that you miss him with just one simple slide
- Share experiences with your friends on the side of the world
- Expat feels less lonely and closer to home
- Gift value from expat to friend
- Easy to use
- Send messages without effort
- Helps you remember the expat

## ABSTRACT

The goal of my IBP is to design a system or device that will help expats to feel more at home abroad. I used literature, interviews, surveys and a context mapping session to find out that the real problem is that they feel far away from the people that really know them. After some more research and idea generation I refined my direction in designing a system or device that will motivate friends of the expat to share their daily life with the expat with use of text messages. So I chose to design something for the friends, not the expats themselves. The biggest challenge for this project was to make sending the messages as little effort for the friend as possible, but still keep it interesting for the expat.

The result of my project is a pendant that can be hung on the phone of the friend. With a simple sliding movement a message is send to his expat friend. Context awareness phones are used to determine what the friend is doing and which message should be send.



## CONTENTS

Draft Final report Mieke Kleppe

yellow = references

green = to do

## 1. INTRODUCTION

This is the final report of my Individual Bachelor Project. At the beginning of my project I set my goal on designing a product or system that would help expats to feel at home in the country they are staying. I chose this subject because I spend three and a half months in China myself for my internship. I met lots of people there that had problems with being in this totally new and different environment where nobody knew them and everything was unfamiliar. I didn't have homesickness, but I think that everyone abroad on his own feels lonely every once in a while and can use some extra support.

### The problem

10% of the population of the big cities in the Netherlands consist of expats (Numbers from Jeroen Visser, ExpatEase). The cities of Amsterdam, Nijmegen and The Hague are working on projects to make their cities more interesting for expats(). They benefit from it when the expat enjoys his stay in the Netherlands. This gives the cities a more international image. Especially for Amsterdam this is important. They subsidise projects that help expats.

Companies try to keep their expats with trainings and workshops for the expats and their families. This is necessary because when an expat leaves this costs the company a lot of money. Recent research (Global Relocation Trends Survey(2007)) shows that 28% of the expats leave before their contract expires. 10% of assignments were not completed because expats left.

### Target group

My target group consists of expats that are in their first 6 months of their stay abroad, in the Netherlands. The definition of an expat is someone who lives abroad temporary for work or study(). The fact that the expat knows he is going back to his home country makes him very different from an immigrant. Immigrants have to try to forget their old country and focus on the new one to reduce their homesickness. (Van Tilburg, Vingerhoets & van Heck,1997) Expats know they are going to leave and will get less attached to their new country. They can reduce homesickness by thinking about home, because they will be returning home. The product I am designing is especially for expats in their first 6 months. This is the most difficult time for them. When they reach the fourth month, their homesickness will reach its top. This is the time when most expats leave back home (ExpatEase). They are in the crisis phase of their culture shock.

### Culture shock

Expats in the Netherlands often experience more problems than they would have expected. They assume that everyone speaks English and that life won't be that much different from what they are used to. But when they arrive they often find it difficult to get used to living in the Netherlands. (ExpatEase) Dutch people are really individually and egalitarian minded, also is our culture quite feminine (Hofstede). Geert Hofstede shows in his research that the Dutch culture is very different from other cultures in these aspects, which makes it difficult for foreigners to settle in the Netherlands.

\*\*\*\*\*Show picture of research of Geert Hofstede (previous presentation)

The culture chock itself comes in stages. Oberg(1960) describes four of them: Incubation, crisis, recovery and full recovery. In the incubation phase everything is new and exciting about the new culture. In the crisis phase the culture becomes familiar and the expat experiences problems with living his daily life. In the recovery phase the expat adapts, he understands the new culture better. In the last phase the expat really feels at home. In my project I focus on the second phase, because this is when the expat decides if he stays or leaves and where he

experiences most problems.

### Homesickness

According to **Baier & Welch (1992)** homesickness is a depression like reaction to a move, accompanied by ruminative thoughts about home, the desire to return home and somatic complaints. The study of **Verschuur et al (2002)** shows that the homesick share similar vulnerability factors with anxiety and depression. So people that suffer from anxiety and depression have a higher chance to get homesick. In the **survey I send to expats in the Netherlands, 39 percent of the expats say they feel homesick. They feel stressed, sad or need a lot of contact. But there was only one person that wants to return home as soon as possible. Analysing the other questions I found that most of my participants miss home, but don't suffer badly from their homesickness. They would like some things to change though. (appendix??)**

In the study of **Van Tilburg, Vingerhoets & van Heck (1997)** they questioned people with two different kinds of homesickness. The acute, away on holiday for a few weeks, and chronic homesick, permanently moved. The chronic homesick cope with homesickness by positive thinking and distraction, this because they know they can't change the situation and it is not going to change very soon. This is why they try to forget the old environment. The acute homesick know they will be returning home, that is why they cope with mental escape and pay a lot of attention to the old environment. Expats will be returning home and they know it, so they belong to the acute homesick.

\*\*\*\*\* diagrams of survey?

## 2. SCENARIO

### Description of the product

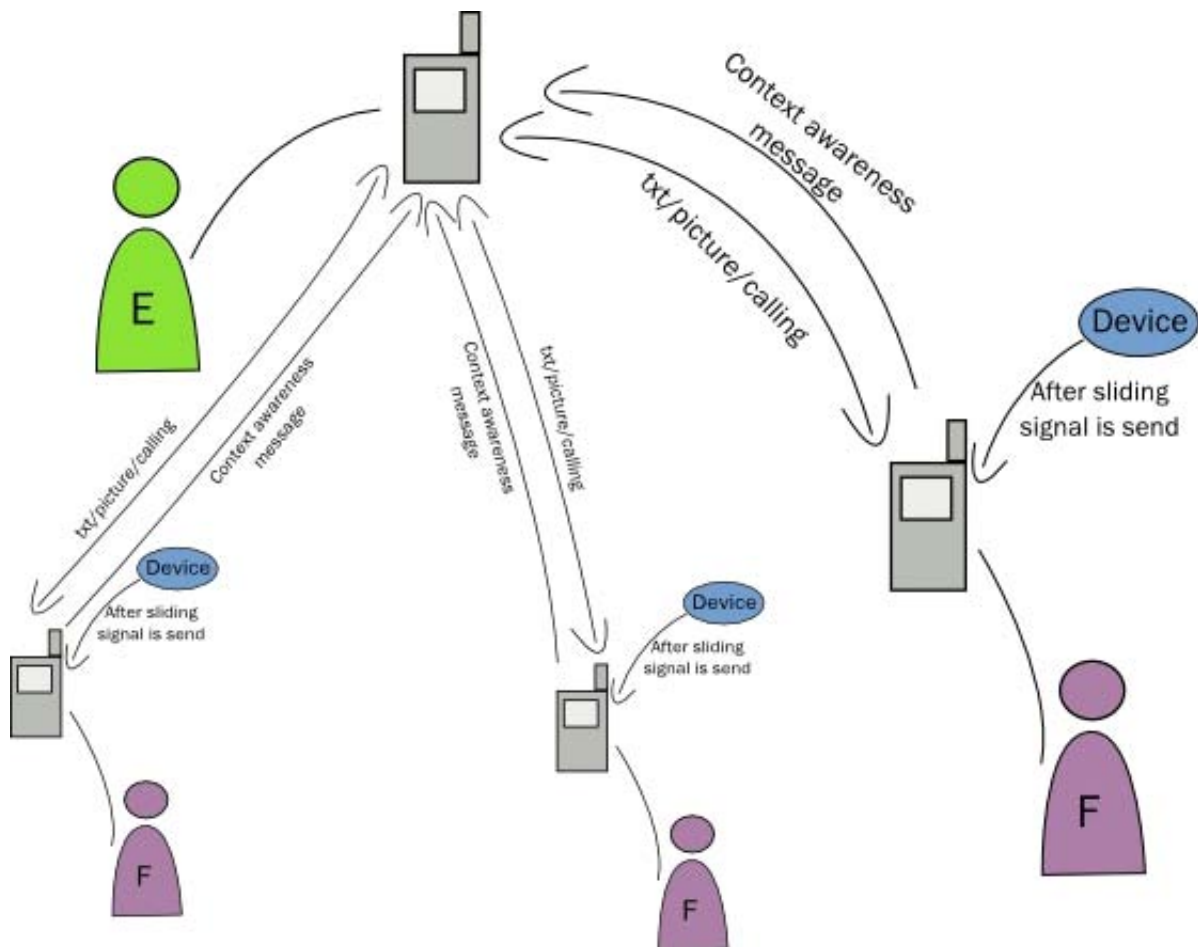
I designed an awareness system that sends reminders to friends of expats. They can, with one simple sliding movement, send a message to the expat with information about what they are doing at that moment.

The goal of the system is to help expats feel more at home abroad. The friends of the expats have busy lives and don't think about the expats that much, they don't keep them updated about their daily lives. This is what the expat misses most. (my own research)

My product changes this by making it very easy for the friends to send messages and reminding them to do so. It consists of a pendant to be attached on the phone and software on the phone.

When the friend slides over the device a (blue tooth) signal is send to the phone. The phone senses what the friend is doing (with GPS, microphone and acceleration sensor for example) and compares this to the intentions (for example an outlook agenda). Then the phone determines the current context. It then sends a messages he chooses from the list that belongs to this context. The list of messages is created in advance, by the friend.

The reminder is activated randomly about two or three times a week and only when both the expat and friend are awake. The reminder works as a motivation for the friend to send a reminder (user test result).



### Scenario

This is my scenario that I used to explain and improve my product. I talked it through with users and experts to get a better idea of what they expect of a product like this and how I could improve my product.

**GET FROM PREVIOUS REPORT, IMPLEMENT CHANGES**

**packaging van device (wat zit er in de doos, hoe ziet het eruit? Hoe ziet gebruiker hoe het werkt?)**

**() When putting software on phone, chose which context you want and select messages. (make sure this is in scenario or packaging)**



### 3. DEVELOPMENT

#### Process

In the following image I visualized my design process as made in the week before my first interim presentation. I used this process to make my planning. It contains iterations, within the different cycles, to help me develop my concept and to take the project one step further every iteration. In the process I showed four different phases. The exploration (yellow), diverge (green), converge (orange) and validating phase (blue). After every phase there is a deadline for myself, to make sure I made decisions in time, so I didn't get stuck.

\*\*\*\*\*picture process\*\*\*\*\*

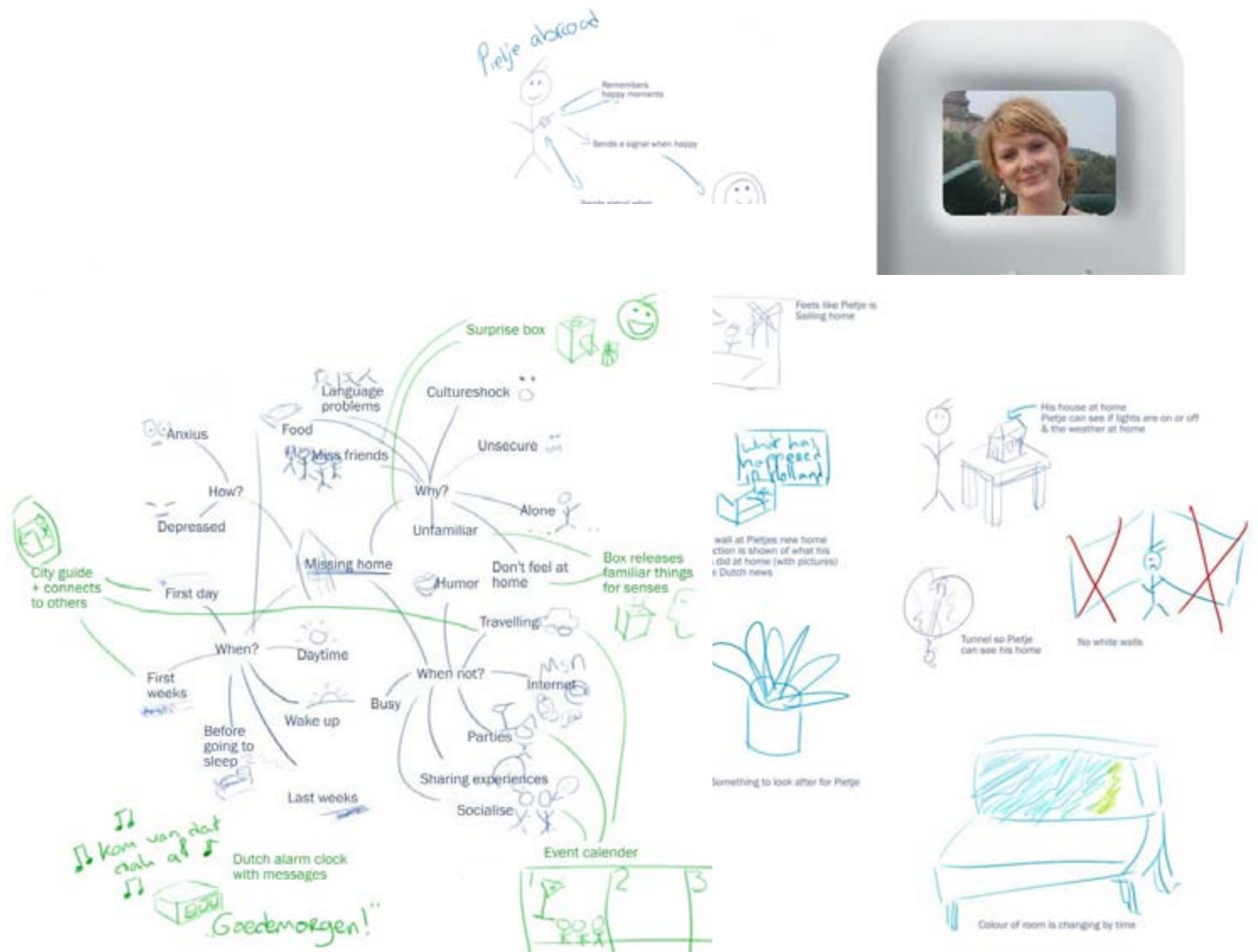
#### Development of the project

In this chapter I will show the different ideas that I had and the different directions I explored in the beginning of the project. But also the different stages that it took to get to the final product.

Pictures of different stages and why I chose different ones. Show early ideas. And show process. \*\*\*\*\* insert lots of pictures

I started with idea generation sessions before I had a direction from my user research. I thought about ideas that would help expats to socialise, share experiences, remind them of home and distract them from their homesickness. I liked the idea of using scent because scent is very much connected to memories. And I wanted to work with surprises from friends (picture ... IBP in a day) at home, that would come at different intervals.

Changing from expat to friend to design for





## 4. DESIGN

*In this chapter I will explain why I made certain decisions about the final product. I will start with the basis and end with the final shape. The development of the actual product and the other ideas I had can be found in the previous chapter.*

### Requirements

*The most important requirements and the reason why I made most decisions are listed here:*

- The friend should be motivated to send messages with at the moment information.*
- The device should make it as easy for the friend as possible to keep in touch.*
- Device should be carried around all day.*

### 4.1 Connecting with home

*The first big decision was the one of choosing a clear direction for my project. Before this ideas were going in all directions, but none of them had a good basis. I chose for making a system or product that would help expats to stay in contact with friends in their home country.*

Participants of my context mapping session all agreed on the fact that it is difficult to build up new in depth friendships in the Netherlands, like the ones they have with friends at home. They know their friends at home for a long time, and because of the experiences they shared together they know a lot about each other. The people the expat meets abroad are all new and the Dutch are not really open to new friendships with foreigners. They already have a group of friends and no need for more friends. So in the Netherlands in depth relationships are missing and this was the biggest problem the expats encounter, the expats feel far away from everyone. I decided to focus on designing something that would help them feel closer to the people they know from home.

Also the results from my first survey support this. Communication devices are seen as the most important things expats brought from home and friends and family are missed most. (diagram survey)

Some of the concepts that came from this direction:

- A playful shared diary combined with camera. It will help people to remember the fun moments and to write about those moments to their friends. Their friends on the other side of the world are also able to share their experiences.
- Binoculars that you can use to write messages to your friends and see the messages they left for you. The two people feel a special connection because it feels real, like something they can both see, written in the stars.
- Wearable with which you can feel warmth and body contact from the other person. They can also let each other know when they feel happy or sad.
- Make each others music play list. They can both communicate their feelings through music and share new nice music.
- Keep each other up-to-date with short messages.

Picture 19: This poster of the expat session concentrated only on connecting with friends at home

### 4.2 Everyday experiences

*Taking another look at my research, I noticed that everyday experiences is what expats miss about their friends at home. They are not aware anymore of what their friends back home are*

doing. I redefined my direction into: Letting the expats feel closer to their friends, by making them aware of their everyday experiences.

During the context mapping session I noticed that all participants talked about the simple things in the lives of their friends that they missed most. They want to share their experiences with their friends at home, but also want to know more about their life. The friend thinks this is not interesting for the expat, so doesn't talk about his own life, if nothing happened. These results I have validated with my survey. 71% says they would like to know more about the daily life of their friends and 53% really don't know enough of this daily life. (show results) Markopoulos (2004) proves that sharing simple experiences through messages and pictures makes people feel more connected to each other. This is the direction I chose: use these everyday experiences to help the expats feel closer to friends at home with short messages.

Picture 17: Picture on one of the collages.

Participant misses talking next to the fire with parents about their day.

Picture 18: Whole poster of the context mapping session.

### 4.3 Motivating friend to send messages

The next decision I made was to design for the friend and not the expat himself. This was quite an unexpected change in my project. The design has to motivate the friends to send messages to the expat. I chose to work with reminders to achieve this.

The expat really misses his friends at home, but his friends miss him less. The expat is all alone, he doesn't know anyone in his new environment. His friends have most of their friends and family around. Their life is still busy. They don't think about expat as often as the expat thinks of them. The expat often keeps a blog or facebook page up to date. So the friend doesn't feel a big need to contact the expat a lot. He doesn't think his life is interesting enough for the expat, therefore he doesn't contact the expat a lot. The expat on the other side feels a bit reticent to contact his friends. Because he is always the one contacting his friends, he doesn't want to bother them too much. This is what I have learned from talking with expats. It is the reason I chose to make a device that would **motivate the friends** to send messages about their daily lives. Short messages like the ones that are used on Twitter (), which has become more and more popular during my project. The messages contain at the moment information about what you are doing at that moment. People like to share this and feel closer to others when they know what they are doing. ()

In my idea generation I developed different ways of motivating the friend to send a message. For example with a game, with use of competition between friends, automatically detect changes in the environment or just ask.

I chose to use a simple and subtle reminder because it is important that the friend does not find the device annoying and he shouldn't put any effort in it. In appendix F more about this subject.

Picture 16: Phone asks for message

Picture 14: 1 buttons for each category

Picture 15: Idea generation for device on expat side

## 4.4 Context awareness

*I wanted to make the effort needed for the friend as low as possible. This would help in the motivation to send a message. This is quite a difficult task in combination with keeping the content of the messages valuable for the expat. I chose to work with context awareness phones to keep the effort low for the friend. Context awareness is described by **Dey and Abowd (2000)**: “Any information that can be used to characterise the situation of an entity. An entity is a person, place or object that is considered relevant to the interaction between a user and an application, including the user and application themselves.”*

### Making the decision

Before the interim I chose to let the friend type a message, so it stays most interesting for the expat. But this is still too much effort for the friend. I chose to work with categories after this and had several idea generation sessions to work this out. **(pictures)** The friend can choose which message he wants to send for each category. This can be a text message, sound, picture or movie. He can make a list for each category, the software chooses a random message from this list when a message is sent. I also thought about adding scent to the list, but this would make the project a lot more difficult and it would also make it necessary for a device on the expat side.

Still many possibilities to select the categories were possible. One direction was to have buttons on a device that would represent the different categories. This was the direction I chose to continue with, but after talking with experts I decided to change this. Because it is too difficult to remember which button is which category and the friend had to look at the device to send the right message, which is too much effort. Another idea I had was that the device could sense where it is, for example with RFID stickers, that could be put on places that the friend regularly is, like at home and at the office. When my coach attended me on context awareness phones, I did some more research in this area. It turned out this was the perfect method for me. With the sensors in phones right now, there are already enough categories to differ. An example can be seen in **picture 12**. For my project I started with four different contexts, work, relaxing, party and travelling. **Picture 13** shows the different contexts and how they could be sensed.

**Picture 11: Button to send message**

**Picture 12: Context awareness phone Häkkinen(2005)**

**Picture 13: Contexts**

### Context awareness phones

is that not all phones have the possibility to do this. 75% of the phones available have blue tooth, USB and an agenda, with these it would already be possible to use the system, only the context awareness would be less accurate. 15% also have GPS, which would be perfect for context awareness. I couldn't find percentages on acceleration sensors. I have found these numbers by comparing different phones on kieskeurig.nl.

### Accuracy of context awareness phones

Of course it is important that the information that comes out of the context awareness is as accurate as possible. The QoC represents the Quality of the Context (**Buchholz et al, 2003**). The lower the QoC the less accurate the information is. In **Siewiorek's (2003)** research can be seen that the individual outputs of the sensor are accurate by itself. The model that **Siewiorek (2003)** uses, causes problems when the sensors make mistakes or the agenda of the phone is not right (for example when a meeting is cancelled or takes longer). **Roodenburg (2004)** shows that when you combine the sensor outputs with the predefined scenario (agenda), you can determine if one of them is not true. The difference in this last model is that it not checks the individual inputs one by one, but combines them. First it checks whether the predefined

scenario fits the sensor outputs. If this is true it goes to the scenario context. If it doesn't fit, it chooses its best fit. Which makes the context awareness system more accurate and the chance for mistakes much lower. Only when most of the sensors give wrong information, there is still a problem, but this chance is very small when the phone is working properly.

## 4.5 A pendant for sliding

### a pendant

I wanted to make a physical device that the expat could give to his friend. It is a reminder by itself. Whenever he sees the device he thinks of the expat. When it is attached to his mobile phone, he sees the device every time he uses the phone. Another advantage from attaching the device to a phone is that the friend will always carry his phone with him and thus, so the device.

To determine which shape and how it should be attached to the phone, I made lots of drawings and clay models. Possibilities were for example a sticker, a pendant or a clip. I did user tests with them. Asked which ones they liked best, what they thought would be the most convenient and what they personally would or would not carry around. I chose to continue with the clip, which I presented the last time. It turned out there were lots of problems with it. For example how it can be attached to every phone, what kind of material would it be and if the electronics would fit. After my presentation I took another look at the clip, did some more idea generation sessions and did a QOC analysis. **Picture**. I chose to trade the clip in for a pendant. It is easier to attach it to every type of phone, people liked it in the user test and also putting it on your phone is much easier than it would be with the clip.

Q: What should be the basic shape / attachment to phone or something else?

	Pendant/ keychain	Jewelry	Sticker	Clip to phone	Cover for Phone
Always with you	++	-	++	++	++
Adaptable	++	+-	+	-	-
Prominent	+	++	-	++	++
Easy to carry	+	+	++	+	++
User test	+	+-	+	++	-
With phone	++	-	++	++	++
Not impede	+	-	+	-	+-
Installation	++	++	++	-	-
	+++++++ +++++++		+++++++ +++	+++++	+++++

### Sliding

The interaction style that came with the clip was a sliding movement to send the messages. Everyone was positive about this part, but I decided to take another look at this as well. To see if it was possible to put some more feeling in the movement. **Brainstorm**. Bringing two things together on one device came out best in the end. But this movement is actually the same as sliding. So the sliding is still the interaction used for sending the messages.



## Interaction

	Hold tight	Connect	Bring together	Rub	Shake
Low effort	+	+-	+-	-	-
All situations	+	+-	+-	+	-
Not unwanted	+-	++	+	++	+
Fun	+	+	++	+-	+-
Value	+	++	++	+	-
	+++++	+++++	+++++	+++	--

Picture 8: the clip

Picture 9: clay models

Picture 10: QOC analysis sliding eerste

## 4.6 A friendly pendant

*After my first final I took a look at things I like, and asked myself why I liked them. First of all I like organic, soft and smooth forms, things inspired by nature. This is something I tried to do in my model as well.*



After I made the decision for a pendant I started with a few basic shapes. I looked at how I could put 'meaning' in the shape. What I could use to metaphors, how I could use nature to inspire me. **Brainstorms + 3d model?** But none of it was good enough and actually looked like a product. Joachim Karelse told me to take a look at other **small objects** that carry electronics

and let myself be inspired by those shapes. I went to stores and looked for new products on the internet. This gave me a much better idea of how I could actually make the product. I decided to use the electronics that would come in the final model as a starting point for the size. They also gave me a **global shape**. With this in mind I made **several Photoshop** models. Based on my drawings, the inspiration pictures and the real products. Out of these sixteen different shapes I chose the best three, made some more details in them and went to users. I asked them to grade them all and argue which one was the friendliest, which the most personal and which one would be most suitable for communication. The shapes that showed a direction were seen as ideal for communication (either the shape or the sliding part). **Shape one** was found a personal shape because it had the shape of a face, users also found it interesting and having a unique shape. It was also the most friendliest because it was soft, round and had the shape of a face. It didn't get the highest grade, but I found the form language more important. When I printed the shape in its real size it turned out that the pendant should be something longer to make the sliding more comfortable. After this it was still small enough to carry it with you. I made the basic shape in SolidWorks and started working on the slider.

## 4.7 An intuitive slider

There are not much products that use sliders, so not much inspiration there. For this reason I took my inspiration from my previous user test where I asked people which shapes they liked. The triangles and ribs were appreciated most for sliding. I made **different variations** on these and showed them to users again. This slider is a combination of which aspects were considered to provoke a sliding movement. It is something lower than the product, so it feels as a different part and it is long, so you think you have to slide your finger over it. I used the ribs for the feel and to give direction. That the spaces in between increase gives it the feeling of movement. I put the whole slider under an angle to make the appearance more interesting.

Other details are the different fillets that I added, the groove for your finger at the back and the injection mould line. These are all to make the product more real and interesting.

The device contains a LED. To give feedback when you send a message. But also to show when you receive a reminder, that you can use the slider to send a message. This came from my paper user test earlier in the project.

## 4.8 The interaction

**diagram?????**

## 4.9 The materials and manufacturing

The product will be injection moulded. Which is very easy with these kind of products and very cheap for mass production. The 3D model is ready to be used to make a mould. The materials down here were the most interesting for my project. I chose to work with PC because it is cheap, strong and easy to manufacture.

*Smile recycled plastics*

**This picture** shows a sheet of Smile recycled plastic. It is made of old mobile phone covers. The sheet can be moulded in the preferred shape. What I like about this is that it is recycled and especially that it is recycled from mobile phone covers. These old covers could get a new life



next to a new phone.

Another positive aspect of this materials is that every sheet and every bit of the sheet is unique. So every product made of it is also unique.

Of course it is not possible to use this material for injection moulding. And it will be much more expensive when its used for mass production than the other materials mentioned.

### *Biopearls*

Biopearls are made of plants and are therefore biodegradable and environmentally friendly. They can be made in different varieties and look and feel like traditional plastics. One reason I don't want to use this material is that the plants made to product these biopearls can also serve as food. When there are still so many people in the world hungry and food is getting so expensive it shouldn't be used for these kind of purposes in my opinion.



### *Polycarbonate*

The more traditional of these materials. Very strong, cheap and recyclable.

**I will use polycarbonate to injection mould the product. It is a cheap and strong material. It is not as environmentally friendly as the other two materials mentioned above. But the recycled smile plastic makes it not possible to injection mould, which makes the production a lot more expensive. I like the biopearls for the fact that they are less bad to the environment as PC, but with the food crisis at this moment I find it irresponsible to make plastic out of food. This is why I choose for the more traditional polycarbonate.**

- **All (final) pictures should be scale 1:1**

# 5. USER

The user was an important input for my project. Especially in the beginning, when I found inspiration and a direction from my users.

## 5.1 A formative user test

This user test was valuable for me in a few ways. The most important for me was to get comments on my design and concept and be able to improve the product with this. I also tried to test if my goals for the project were met.

### set-up

The goal of my project actually consists of two sub goals:

1<sup>st</sup> goal: Make expats feel more at home.

2<sup>nd</sup> goal: Motivate friends to send messages about their everyday life.

The goal of this user test is to perform a formative test that will help me to improve my concept. The second goal of the test is to see if my main goals for the project are met.

In the first two versions of this user test I only wanted to test if my goals were met. I wanted to do this by following participants for a day and use a Wizard of Oz and send the reminders and messages myself. Talking this through in the awareness class with Koen van Turnhout and other students with awareness projects, we thought that the outcome of this user test would always be positive. If I was to follow them for one day, they would always react to the reminders, just to 'help' me with the user test. Another disadvantage would be that I would follow every participant for only one day. To get results I would send 4 reminders on this day, which is quite different from my concept.

Another problem with the first two versions were that I wanted to test everything in one test, which made the test very complicated, not only for me, but also for the participants. In this version I chose to test a simplified version that still would meet my goals. This also helps me to test the participants for a longer period.

The final appearance will be tested in another test.

Participants: I will test 2-4 Dutch people that currently have a friend abroad. More would be better for the results, but with the time this is impossible.

Prototype: I will not build a prototype for this user test, it will not be possible to build a prototype that will work properly and send real text messages. Testing without prototype allows me to do multiple user tests at the same time for a whole week. Both the expats and the friends will use their own mobile phone. The reminders will be text messages that I send to the friends in the Netherlands. They send an empty message back to me, which will be almost no effort for them.

Final design	User test
Pendant on phone	Participants will use own mobile phone
Reminder on pendant (vibrate, light, screen on phone)	Text message
Slide to send a message	Reply with empty message
Phone senses context	I choose context based on time schedule friends made before the test.

Test:

1<sup>st</sup> goal: I will ask the expats to fill in a simplified abc-questionnaire before and after the test. This to see if they think more about their friend and if they feel more connected. After the test I also send them a questionnaire about how they experienced the user test week.

2<sup>nd</sup> goal: I will start by asking the friend how often they have contact at the moment and through which medium. I will ask him to chose context, send his time schedule for the coming week and type at least one message per context.

In a period of 7 days I will send a maximum of 6 reminders to the friend. I will make sure he knows that he can ignore the reminders. If he replies with an empty message I will send a message to the expat. I select the current context from his time schedule and send a corresponding message from the list made by the friend.

At the end of the week I send them a questionnaire about how they experienced the week.

Nog plaatje toevoegen

## Results

I performed the user test with three pairs of participants. The three Dutch expats are abroad at this moment for longer than three months. In Italy, China and New Zealand. Their friends are all in the Netherlands and good friends (in one case also sisters) of the expat.

The friends were free in what kind of messages they wanted to send for each context, they could choose to make a list of messages per context. The three friends all chose to send different types of messages. Looking at the results I think these messages had a huge effect on the user test, therefore I will look at the results individually.

### *The types of messages*

#### *Expat & Friend 1*

Friend 1 had chosen for 6 different contexts, study, party, holiday, train, spare time and work. One message per context. The messages were a full text message (around 160 characters) and very personal. Messages begin with a greet to the expat. Followed by what the friend is doing at that moment, with a feeling she gets with this activity (it is boring or 'gezellig'). Then a question for the expat (how are you doing?). And at the end a kiss.

Reactions:

Friend: "I think that she liked receiving these messages, she always says she would like to have more contact with me."

Expat: "Very nice and unexpected, usually I don't get messages from her without reason." "I liked hearing so much of her."

#### *Expat & Friend 2*

Also 6 contexts; study, sit outside, going to a restaurant, meet with friends, travel, sports. One message per context.

The messages were a short description of what the friend was doing at that moment (I am lying in the sun).

Reaction from expat:

"It felt like an automatic update, I would prefer a more personal message with a beginning and end."

### Expat & Friend 3

Friend 3 also chose 6 different contexts; Working at uni, working at home, staying at parents for the weekend, cooking, spare time, sports. Friend 3 chose to have two or three different messages for each context.

Messages are more personal than Friend 2's, but still a description of the activity. For example: "Everyone is working very hard here, bluh" or "Salad with tomato, bacon, mozzarella and a delicious pesto dressing...".

#### Reaction from expat:

The expat liked to receive these messages but missed some details, other text messages from the friend are longer and more interactive. Expat: "A message like 'Busy, busy, busy...' is funny, but doesn't say much."

#### Conclusion:

The reaction of the expat depends a lot on the type of messages. They prefer personal messages with a beginning and end, more like a standard text message.

#### Redesign:

Default messages should be like an example for a personal message. For example: "Hi, at the moment I am sitting in the train, I am quite bored. How about you? Kisses!". This encourages the friend to write more personal messages. It also gives him a better idea of what is expected.

#### Redesign:

In the calendar on the phone specific messages can be added for a specific activity. This to keep the messages more interesting and especially for that moment.

#### Reminders:

##### facts:

	Usual (week)	Reminders replied	Reminders ignored	Other contact
1	½ mail + ¼ phone	3 (1 time typed own message)	3	1 mail
2	2 mail + 1 sms	4	2	1 mail + 1 IM
3	½ mail + 1 phone	5	1	-

The messages were ignored because friends forgot to send a message back (2) or because they just didn't want to send a message at that moment (4).

#### Reactions to the reminders:

Friend 1: "Sometimes I liked the reminders, but I rarely send text messages so sometimes it was a bit too much, one or two reminders should be enough for one week" "I didn't feel obliged to send a message, I just send one when I wanted to." "I wouldn't have send the message without the reminder, it turned out to be quite convenient that I send the message"

Friend 2: "Because I could chose to ignore the reminders I didn't find them disturbing. Sometimes the reminders came at moments I wouldn't think of sending a message myself, that was quite funny. "

Friend 3: "I liked the amount of reminders, there definitely shouldn't be more." "I liked the reminders, now I didn't have to think about sending a message myself." "It gave me a good feeling that I thought about the expat, though actually it came from the reminder." "I would like to know which message will be send and maybe the opportunity to chose between the

messages.”

### **Conclusion:**

They all send more messages than they usually do. Two or three reminders for one week is really the maximum, which was the idea for the final product. The reminders were overall good received by the participants.

### **The effort:**

Friend 1: “It is a bit weird that I don't know what message I am sending, but it is easier.”

Friend 2: “I liked that when you have no time, you can still send them something, which is nice.”  
“Sometimes I don't like it that the messages are so unpersonal.”

Friend 3: “I will send more messages this way, I don't have to think about what to send, and because it is fast it is most of time possible to send a message.”

### **Conclusion:**

It is important that friends get to see which message they are sending. Because it is fast they sometimes send messages at times when they otherwise wouldn't.

### **Redesign:**

Friends should not only see the context that is at the moment, but also the message that is send. Nobody wanted to send a message without knowing what it was.

### **ABC**

I only received two of the three second ABC questionnaires back, the ones of expat 2 and 3. I could see that of expat 3 the connectivity has grown on questions where the connectivity of expat 2 became less or stayed the same. I think this has to do with the type of messages that are send. Many of the questions are about the feelings of the other, and Friend 2 didn't write about this at all in the messages. Other questions are not filled in by one of the expats. It is therefore very difficult to get real conclusions from this ABC questionnaire. On average, nothing changed in the outcomes when comparing the two, but I think this is mostly because of the impersonal messages that are send.

### **Discussion about this test**

The most interesting for me, and the project, are the answers I got to the questions. They showed me that the expats appreciated the messages, but it is important that the messages are personal. It shows me that the friends like the reminders, but do want to know what they are sending. And it shows that when it takes no effort to send a message, more messages are send and at different moments. These answers from people helped me to improve the product. This formative, qualitative part of the user test was for me the most interesting.

The ABC questionnaire expats had to fill out before and after the test was the quantitative part of the user test. To get representative results from this questionnaire I should have tested more people. I saw that the types of messages again had influence on the answers. Expat one was a lot more positive after the test, just like Expat 3, where Expat 2 felt less connected. So the types of messages have a lot of influence on the connectivity. The overall effect was positive, but more participants should be tested to really verify that the concept works. Also should time have been ruled out if a more extensive user test would have been possible.

Because I found it important that the context in which I did this user tests were real, I only tested three pairs of expat and friend. This did gave me enough feedback on if the product will work, how they experienced the user test and what is important for redesign. Which was for me the most important to get out of this user test.

The goal of my project actually consists of two sub goals:

1<sup>st</sup> goal: Make expats feel more at home.

2<sup>nd</sup> goal: Motivate friends to send messages about their everyday life.

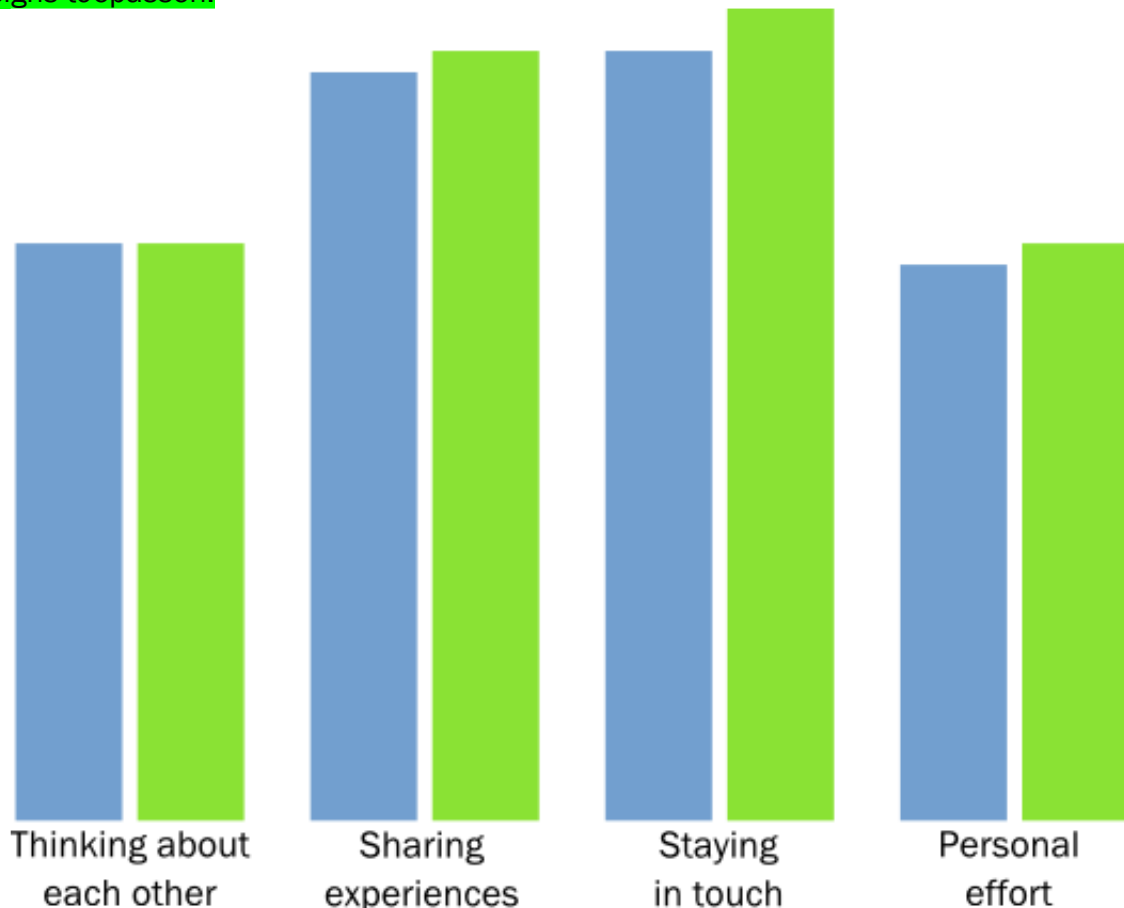
Are these goals met? explain!

Nog plaatje erbij om uit te leggen hoe en wat

voorbeeld van schedule???

(more messages -> more connected -> less homesick.)

redesigns toepassen.



## 5.2 Survey

This was the first time in the project that I came in contact with users. I held a survey under expats in the Netherlands. I used the results for inspiration and for selecting users for my context mapping session.

set-up

I started my user research with interviews with expats on the phone and in meetings. These outcomes would serve as inspiration for my project. Because I found too much users, interviews would take too much time, a survey would be better and faster to analyse. As my next step is to have a generative session with my users I needed to select users. This is also a reason why I chose to work with a questionnaire.

I made the survey based on the basis of my first interviews, to be found in appendix A. These interviews functioned as a pilot test for my survey. I talked this through with Jacques Terken, user

expert. I decided that I wanted the survey to be as easy accessible as possible, to get as much results as possible. For this reason I made an on-line questionnaire with multiple choice answers, this has another advantage that it is easier to analyse. I thought the questions and answers well through and made the answers more abstract when there were too many for one question. Before sending the survey to my users I did a pilot test. I let someone fill out the questionnaire and let him think out loud. I looked at his reaction to see if there were mistakes or things that were not clear enough. After fixing **this I send the questionnaire to my users.**

## results

**As stated before my questionnaire will be used for inspiration and selection. I received 18 responses, which is not enough for a formal study, but it gives me a better idea of my users.**

**One of my conclusions is that people are the most important for the expats.** This is what they miss most (figure 2) and belongings with which they can communicate are the most important for them (figure 3). They miss their family and friends most (figure 2) and they feel at home when they are among other people (figure 4). This can be an interesting aspect for my project. The main reasons for the expats to find other expats is that they speak the same language and to share experiences. Interesting responses came also from the question why they think they don't have enough contact with home. This is what they replied: It is difficult to call, because I need to be at home; I miss happenings and simple experiences of friends; because of the time difference; I am limited to phone, but I want to do things together; I try to avoid contact because contact makes me feel frustrated.

Another thing that can be concluded is that a solution would be best for when they are alone or a solution that makes sure they are not alone. It shouldn't become a product that just remind them of home (figure 5)

## 5.3 Context mapping

*This session determined the direction of my project and was therefore very valuable to me. It gave me insight on which topics are most important for my target group.*

### background

According to Sanders and Williams (2001) is the only way to make truly human centred designs, by involving users in the front end of the project. They say there are different ways to do this, which get different results. These are:

<i>What people</i>	<i>Method</i>	<i>Knowledge</i>
Say / think	Interviews	Explicit
Do / use	Observations	Observable
Make / dream	Generative sessions	Tacit / latent

**Table 1 (text from Sleeswijk et al, 2005)**

I never tried to find out in a project before what people really want in the future with a product. I think this is an interesting topic in my project. I use the creativity of my users and what people really think that is important as inspiration for my ideation phase. I will use the method context mapping to achieve this, Jacques Terken introduced this method to me. This method uses product proposals and/or collages to find deeper lying motivations, needs and values (Stappers & Sleeswijk-Visser, 2007). This happens because people make designery artefacts and tell the story that comes with it. This story is very important, because it tells you the thoughts and values behind the artefacts.

## goal

At the end of this session I know what important themes are in the eyes of my users and what they think is their ideal situation. I will use these themes and the collages as inspiration for my ideation.

## Participants

I chose to work with one group session. In a group people can react to each other and it gives a more global view of the context. I do have to make sure that I get enough individual responses and the moderation has to be good.

4 to 6 participants is best for a group session. 4 people are enough to give the participants a group feeling and with 6 people it is still possible to give enough attention per individual. (Sleeswijk et al, 2005)

I invited 6 participants, I chose the participants for their diversity. For this I looked at gender, country and if they feel homesick. Diversity in the group will make the discussions more interesting. I have chosen one designer in this group. It's good to have someone in the group with experiences with creativity. This will motivate the others.

## Session planning

The session will take about two hours and will consist of two rounds. The participants will make collages or storyboards or a combination of those two, they can choose this themselves. This because a collage is very easy accessible. The first round will be to get familiar with the technique and to reveal the context as it is now. The second round will be to show the ideas and dreams of the participants. In this second round the method can be more abstract.

## Results

### Pictures of the collages

In this session I found that what they miss most about home are their friend. And more specifically the simple things they do with their friends. What they talk about. Their daily lives. What makes these people special is that they know each other for such a long time already, they know everything about each other.

But when the expat leaves, he gets no longer updated on the lives of his friends. He is no longer aware of what they are doing. Because of this the expat feels no longer connected to his friends. This is what makes living abroad so difficult.

## 5.4 Other tests

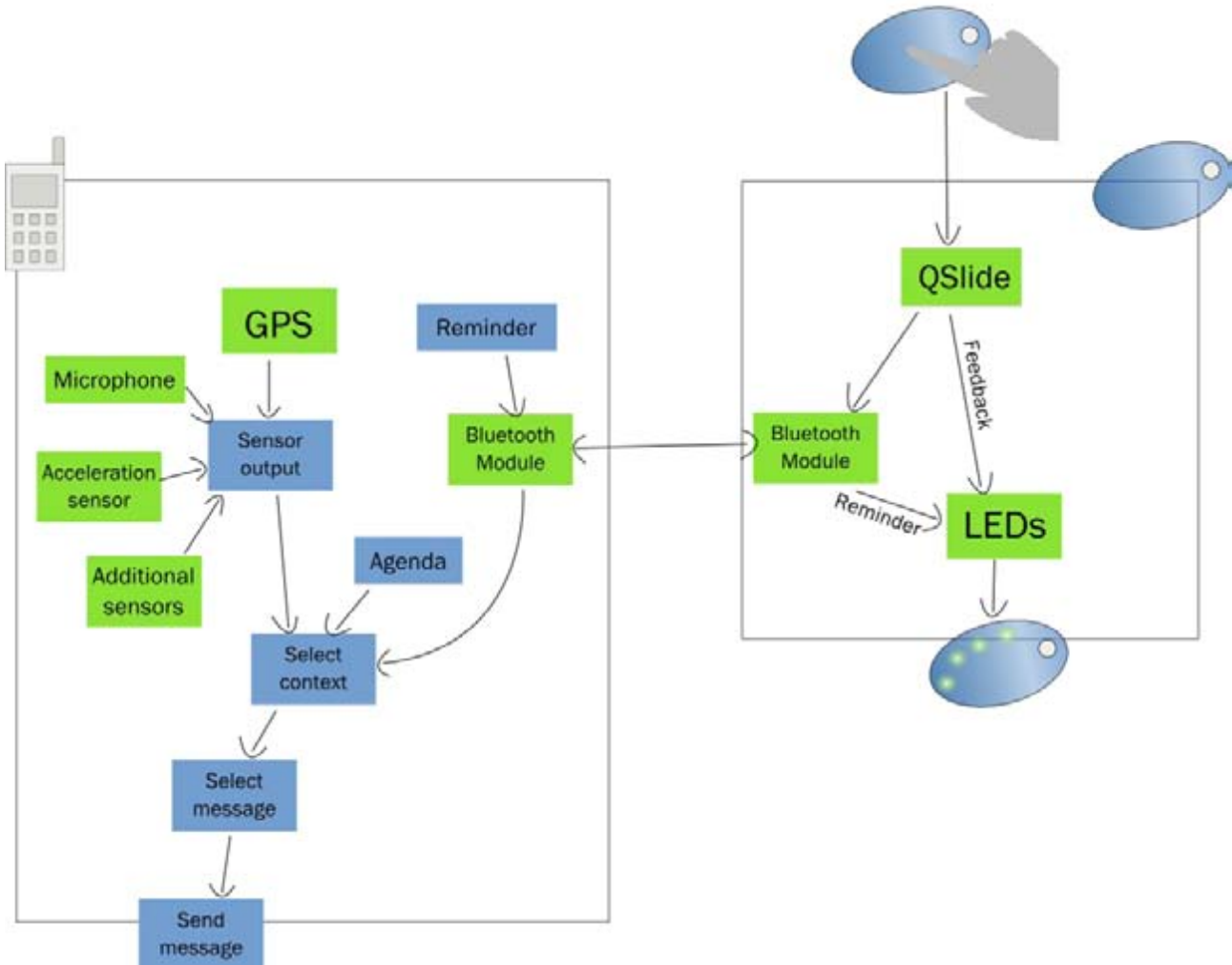
I performed many small tests for different details of the concept. I talked my scenario through with users, after which I made some changes. I also did small tests on the shape, interaction and details.

### Pictures



## 6. TECHNOLOGY

My design consists of two parts. The software on the phone, that works together with the hardware of the phone, and the hardware in the device. This pictures shows how they are connected.



### Prototype

The goal of this prototype is to communicate the product. I also want to use it for a final user test of the appearance. I used a micro controller with as outputs the LED's and an LCD screen (to simulate the receiving phone). The LED's can be green or red. Red for the reminder and green to show the message is send. The LCD shows the message that is send. The program divides the message into characters and sends them individually to the LCD, with after each character a control signal. Which message is send depends on the intensity of the sound. To be able to measure this I made a circuit which 'memorizes' the value for a few seconds. This because the output of the microphone as itself is not easy to process for determining the intensity of the sound, as can be seen in picture 6. In the C program on the micro controller I used an AD converter to process the signal. I used two pressure sensors to make the sliding part, for the first prototype. For my second prototype I used a QT160 touch sensor, which is an older version of the one I will use in my final technology. This sensor gives a high value when a finger approaches the electrode. Picture 7 shows the circuit.

I used rapid prototyping for the casing of my product. I wanted to use this technique because it is more and more used by companies and design studios for prototyping, but also

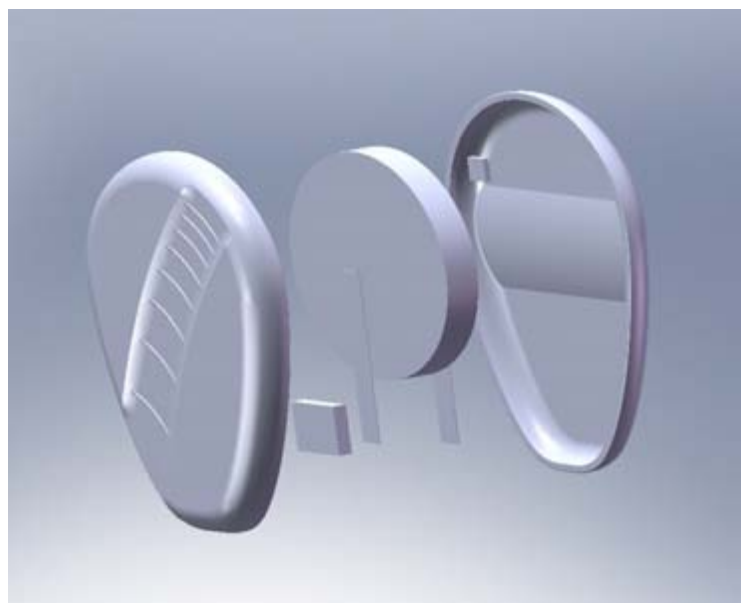
manufacturing. Another reason is that my model is so small, it is almost impossible to make this model with all its details by hand. I used my 3D model and adapted it a bit to make it ready for rapid prototyping.

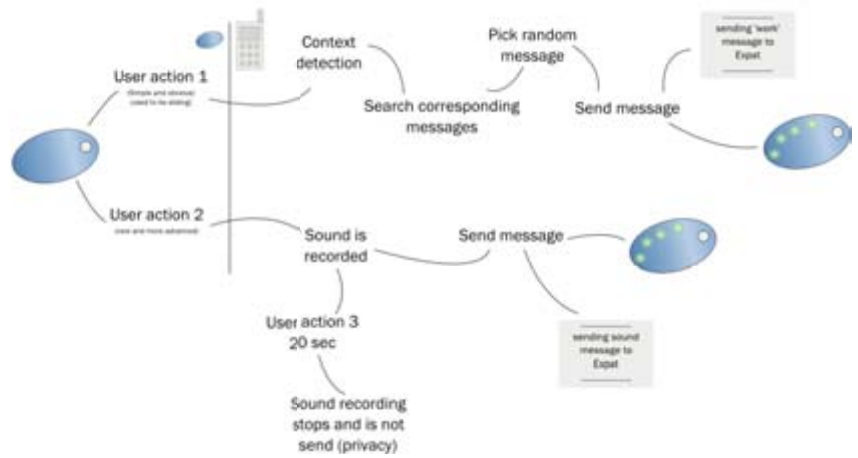
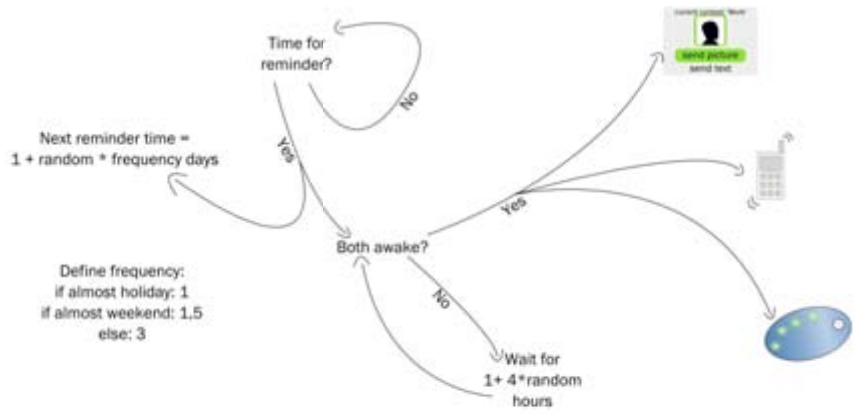
### **Final technology vs prototype**

	<b>Final technology</b>	<b>Prototype</b>
<i>Material</i>	Polycarbonate	Polycarbonate
<i>Manufacturing</i>	Injection Moulding	Rapid Prototyping
<i>Lighting</i>	LEDs	LEDs
<i>Connected with</i>	Mobile phone	Phone prototype
<i>Message</i>	SMS message is send	Shown on LCD screen
<i>Shape</i>	Final shape	Final shape
<i>Dimensions</i>	50x35x8 mm	50x35x8 mm
<i>Slide sensor</i>	QT1106	QT160 (older version)
<i>Context awareness</i>	Microphone, GPS, Acceleration sensor, agenda	Microphone
<i>Communication with phone</i>	Blue tooth (LMBTA068)	Wires
<i>Battery</i>	VL3032 (rechargeable)	Plug

### **Final Technology**

On the following image can be seen how the system works and what the software actually does. **NOG AANPASSEN.** | Which technologies are used can be seen **in the table a**bove. How the electronics fit in the device can be seen **in these pictures.**





## 7. BUSINESS MODEL

Note for Hu Jun: I will have a meeting with Bert Pompe tomorrow to talk this through. He has his own company. Brombacher said they really don't help anyone with competency 5 this semester and we cannot be judged on this aspect.

- denk aan kleur, voeg toe aan business model. (zwart + shiny = professioneel & mannelijk)  
Maar moet wel passen bij elke telefoon
- business : achterkant voor mogelijkheid logo noemen
- Meer verhaaltje over de user, characteristics, needs, interests, motivation
- current solutions, competitors

Product and service:

The product makes that expats feel more at home abroad, by making them feel closer to their friends at home.

The market:

10% of the population of the big cities in the Netherlands consist of expats. Many of those expats are in the Netherlands to work temporarily for a company. About 30% of these expats leave before their contract expires. This costs these companies a lot of money, therefore they want to do everything to keep the expat in the Netherlands, working for them.

Target group:

The product itself is designed to be used by friends of the expat. Those friends are still at home, living a busy life. But the person benefiting most from the product is the expat. He receives the messages.

The actual costumers are the companies the expat will be working for or the city he will be temporary moving to. These parties will send the product to the expat before he moves. He can give the product to a selection of friends he wants to stay in contact with.

Costumers, needs:

There are two potential costumers, that will be prepared to buy the product.

1. Companies that employ expats. Lots of companies employ expats, they especially need higher educated employees. If they can't find them in the Netherlands, they will go and look for them abroad. This process is quite expensive and becomes even more expensive when the expat leaves before his contract expires, which happens in about 30% of the cases\*\*\*\*\*. These companies are prepared to pay money for a solution that will better satisfy their employees and will prevent them from going back home too soon.

2. Big cities with a lot of expats. Amsterdam and The Hague for example, where 10% of the population consists of expats \*\*\*\*\*. Especially Amsterdam is looking for ways to be more attractive to foreigners.

How does product contribute:

Both of these costumers would buy the product and send it to the expats before they come to the Netherlands. They distribute the devices to their friends. Their friends will keep in contact with them through the device. As the expat is more aware of what his friends are doing, he will feel more connected to them. This will help him to feel more at home, which helps him to stay

longer abroad.

Competitors:

At the moment there are no competitors. The only company in the Netherlands that helps companies with expats to make them feel more at home is ExpatEase. They give workshops to expats and their families to help them adapt to the Netherlands.

What is different about my product? What is innovative about it?

There is nothing on the market for expats at the moment. The only thing that is being done to make them feel more at home is workshops that are given to expats. For the product itself, the new and innovative part is that information from context awareness is used to send messages with what you are doing at that moment. Because of the simple interaction it takes no effort to share this information.

Product:

The friends of the expat receive the product from the expat. With this gesture he says he wants to keep in touch with him while he is away. The product consists of a pendant that can be attached to his mobile phone. At random times, two or three times a week, when they are both awake, the friend receives a reminder. The friend can react to this reminder by simply sliding over the product. By this action the phone senses what the friend is doing, he uses a combination of the agenda and different sensors already on the phone, such as a GPS sensor and a microphone. It selects the current context and chooses a corresponding message from a list of messages (text, sound or pictures).

Through these messages the expats is aware of the daily lives of his friends. From my research \*\*\*\*\* I concluded that this is a problem for expats at the moment. \*\*\*\*\* The expat feels more connected to his friends at home because of this awareness.

The reminders help the friend remembering to send messages. The friends are often busy and not always thinking about the expat. The reminders help to keep in contact regularly. Another advantage for the friend is that he doesn't need to think about the time difference.

The actual product will consist of a device and software to be put on the phone of the friend.

Bottlenecks:

One bottleneck is that after a few weeks the product is not interesting any more and would be used less. This should be tested. Another bottleneck is that not all phones are prepared for context awareness. But this is changing rapidly at the moment.

Other possibilities with the product:

Instead of only use the product for expats it can be used in the same way by everyone who is far away from the people he loves. For example people who are in the hospital for a longer period or people in an old peoples home. In this case the home of the hospital could buy the product and provide them to their patients. The product could be sold on the internet, but also at the Office Centre or directly to the companies.

Another possibility is use the product not only to send messages to one person, but send the message with what you are doing to multiple people or to twitter, facebook or hyves for example. The goal of the product is not any more to make one person happy by sending messages, but to share what you are doing with the world. This is getting more popular by the day. People are telling what they are doing at that moment on the internet by using twitter or

facebook. This product could be the bridge between these network sites and the real world. Companies like Vodafone or Nokia could sell the product, It would be a real gadget that you can attached to your phone and use to always keep everyone informed about your life.

**SWOT (product)**

<b>Strenghts</b>	<b>Weaknesses</b>
– The expat receives more messages.	– Not everyone wants a pendant on his phone (can be used as a key chain instead).
– The messages contain at the moment information about what his friends are doing, which makes him feel more at home.	– The information might not be rich and valuable enough to the expat, because every time the same messages are send. (This is why friends can make a list of possible messages for each context and they can change this list whenever they want to.)
– It is an awareness system where friends choose to send messages.	– The friend might not want to send the same message every time (there is a possibility to change the messages and make a list of different messages)
– Reminders motivate friends to send messages.	– With time differences the same contexts might be used every time.
– Reminders only happen on times when both the expat and friend are awake, so the friend doesn't need to bother about time differences.	– Context awareness is not possible on every phone.
– The interaction is easy and fast, so no effort for the friend to send messages.	
– The device is small and attached to a phone and will therefore always be carried with the friend.	
– The expat doesn't need another device to receive messages, he can use his phone.	

<b>Opportunities (future changes)</b>	<b>Threats</b>
– Record sound with a second interaction to make it more interesting. This is not a static thing, but still easy for the friend. Though privacy issues might make a problem.	- The product is bought by the company, send to the expat, who gives it to his friends. So the product has to go through a lot of steps to reach its user.
– Take pictures	- Product is used for only the period the expat is away.
– There might be always a possibility for the expat to see what his friends are doing. Reminders motivate the friend to send some extra information.	
– After usage product can be adapted so it	

will become a souvenir.	
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<b><i>Process tree of the product</i></b>
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Product is manufactured
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Sold directly to companies with a lot of expat employees. Also a possibility for smaller companies to buy it on the internet.
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Company sends package with multiple products to his future (expat) employees.
---

Expat selects a few friends and gives them the product.
---

When expat is away product is used to send messages.
--

When expat returns product can serve as a souvenir.
---

## DISCUSSION

My final test results were quite positive and show, for as far as I can test it, that the product works. I talked with many expats and got positive reactions from this. Also the participants of my test turned out to be positive, even though some of the friends were a bit sceptical in the beginning. The reminder helps them to remember their friend and when they send a message they feel good about it. Because it takes no effort to send a message they send messages in situations where they otherwise wouldn't have done this.

There are still some points of improvement on this design. For example the pendant itself. It is possible to attach it to every phone, but some people might not want a pendant on their phone. These people could use it as a key chain instead. It misses the connection with the phone, but they do always carry it with them.

Another drawback is that context awareness and blue tooth is not possible on any phone. Although most new phones do have this possibility. More and more phones are getting these options, but still some people might not be able to use the device with their phone.

Another thing that might be possible is to look for possibilities to use the product in different environments. For example children sending messages to their grandparents. Their home could distribute the devices in this case. The only thing the grandparents need is a phone for receiving the messages. In hospitals it would also be an option.

Another possibility for sales would be using the device to keep your status on-line up to date. In this way a much broader target group would be reached.

I have also thought about some more possibilities for the product itself. Some ideas:

- You could also have the possibility to see what your friend is doing, after a reminder the friend could send some more personal information.
- Use a second interaction to record sound. This is still easy for the friend, and valuable for the expat.

These things would cause a change in the concept and would need to be tested before implementation.



## REFLECTION

It was more difficult than I thought it would be to do this whole project on my own. In a team I usually motivate the team and thereby myself. In a team I am usually the one forcing the team to make decisions. I never had much problems with this in my last few teams that I worked in. But suddenly when a decision has to be made by me alone and there is no-one that knows as much about the project as I do that I can talk with it makes it a lot more difficult, it all depends on me. I noticed that talking with other people and making a clear analysis helped me a lot in making decisions.

I realised that what I like most about projects is making a process and deciding how things should be done. But then when I have to do it all by myself, I am suddenly less motivated. I like making the process and planning better than actually doing the project. With a few exceptions. Which are the user tests and tinker with electronics and programming.

In this project I liked the user part at the beginning best. The context mapping session helped me to get a clear direction and gave the project a twist that I couldn't have predicted at the start of the project.

I would like to learn more methods and specialise myself in the user area. For this reason I will start the Human-Technology-Interaction in September. Here I will get technology classes as well as psychology.

Technology is another part that I am always interested in. In this project I was able to use the skills I already had and of course learn new things. For example working with the LCD, this wasn't as easy as expected. It helped me to understand my micro controller and the compiler better.

Design is the area that I am less interested in. Though I have grown in the competency Form & Senses. I learned more about design during my internship. In this project I tried to apply this knowledge. At my first final I got comments on my design. This forced me to be more critical about my own designs. I asked myself if I would have found my design (the clip with the globe) good enough if someone else had designed it. The answer is no. It doesn't actually look like a product, its not professional at all. I did another design iteration and forced myself to be more critical this time, with result I think.

On idea generation and selection I learned how important it is to know your problem. I also like to involve other people in this phase of the design process, to broaden my mind. Even if it is an individual project.

Because of my process the outcome surprised me. The problem as I described it in the beginning turned out to be different after my user research. Which gave an interesting turn for myself to the project. In the first weeks I did an IBP in one day and I thought then that the outcome would be something like this. I couldn't have predicted the outcome I have now. That is what I like about making a design process. In the beginning I say what I want to have achieved by the end, but this is still very abstract, I have no idea about the real outcome yet. It is a challenge to make a process that can be used in different situations and leads to the best outcome.

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