

Magnetic clock: Contextual Information Exchange

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DPC13 Contextual Information Exchange

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Introduction

1.1 Abstract

The non face-to-face communication of social and emotional experiences between people now go through phone or other media like e-mail, IM (instant messaging) or webcam (e.g. Skype). In communication the context plays an important role. However the context tends to be lost in these media - it hardly enables us to communicate the context in a way it is experienced by the other person. One can only imagine. Design a system to communicate the context of a remote user, across the information space.

1.2 Approach

(1). 1/10/100 method

1/10/100 is a new design process which I have not been used before. In this case, there will be three iteration in this project. Each iteration will have a complete design cycle. I will describe it seperately in the report. I hope that I can get a more concrete result from this method.

(2). General approach

New design process is not the only thing I want to learn in this project. I choose this project since I have not been through any project which is relatively abstract. I will meet different unpredictable problem during the entire process. I really want to challenge myself and find out an innovative solution. I will concentrating more on design process, brainstorm facilitation, user research and prototyping.

2. Activity week

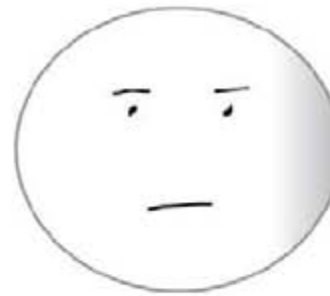
During the activity week, I start a pressure cooker project with several of my team mates. None of us was clear to the project description. We have no idea but just try to find out something. After the brainstorm session, we came out with a emotional mouse which can express personal feelings remotely and abstractly. We built several clay model to present our concept.

E-mouse:

The e-mouse is a tool to communicate social and emotional experiences to a receiving person via a computer mouse. The mouse is able to transfer the 'feelings' of a person to another person by changing its shape. The remote user can influence the shape of the mouse.

With these shapes, we would like to try to give an extra experience to the use of a computer mouse while chatting on the computer.

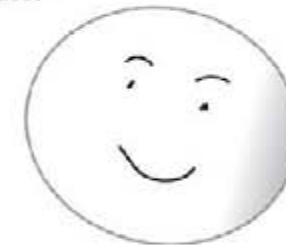
The shape of the mouse can represent his feelings, for example, a flat mouse stands for sad, a round mouse stands for happy and a twisted mouse stands for mad. We chose to create these kinds of mouse shapes, because of their ergonomic form. A flat mouse is more difficult to handle, and therefore less comfortable. This way you can feel empathy for the remote user by using this mouse. When the mouse changes into a round shape, the shape is more comfortable to use. When the remote user is mad, the mouse changes into a twisted shape. This is very uncomfortable for the receiving user.



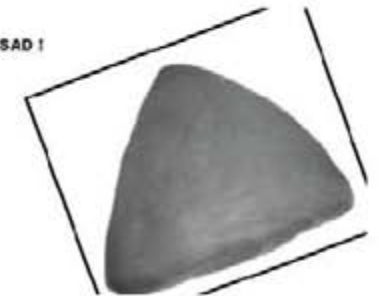
Feeling 1 MAD !



Feeling 2 HAPPY !



Feeling 3 SAD !



3. Iteration | (3 weeks)

3.1 Point of departure

In general, the project is still too vague to us. The purpose of this iteration is to work with each other and find out where we can go. The iteration will through literature study, research, brainstorming and prototyping.

3.2 Research

3.2.1 What is context?

Dey et al. in *Understanding and Using Context*

“Context is any information that can be used to characterize 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 applications themselves.”

“The user’s emotional state, focus of attention, location and orientation, date and time, objects, and people in the user’s environment.”

Schilit et al.

“Context is location, identities of nearby people and objects, and changes to those objects. The important aspects of context are: where you are, who you are with, and what resources are nearby”

Brown et al.

“Location, identities of the people around the user, the time of day, season, temperature, etc.”

Context is the surrounding in which you are in. This has an influence on what you are doing, because you will for instance not try to do important work which needs quietness and serenity in a room full of small children playing and crying.

Thus the surrounding or environment in which you are in mostly says something about what type of activity you do and what type of atmosphere is in your surrounding. A part of someone’s context is also the way he or she feels within the surrounding and feels in general. Since how a person is set in an environment also depends on how he or she feels and acts within this environment. Light, temperature, movement, sounds, scent, touch and several other factors take care of differences between contexts.

Context contains first of all out of the surrounding; the place (physical state), the people who are there (social state), the activity that is going on (informational state). Furthermore, the context exists of how the user perceives this total surrounding and the emotions this person has at that specific moment or during the activity (emotional state). Context contains thus out of four elements: the user’s physical, informational, social and emotional state.

The classical definition of the context is given by Dey in his doctoral dissertation (Dey, 2000)

Context is any information that can be used to characterize 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.

Context is a notion used in the language sciences (Linguistics, sociolinguistics, discourse analysis, pragmatics, semiotics, etc.) in two different ways, namely as

- verbal context
- social context

Verbal context refers to surrounding text or talk of an expression (word, sentence, conversational turn, speech act, etc.). The idea is that verbal context influences the way we understand the expression. Hence the norm not to cite people 'out of context'. Since much contemporary linguistics takes texts, discourses or conversations as its object of analysis, the modern study of 'verbal context' takes place in terms of the analysis of discourse structures and their mutual relationships, for instance the coherence relation between sentences.

Social Context

Media, internet, newspaper even books are influencing people's recognition of value, style and their behavior which can also be considered as a tool for exchanging the context information.

3.22 What is the value of context?

Context values; the groups

1. Intimacy, Empathy & Connectness: value in connecting to or empathizing with a closely related person. LumiTouch[3] would fit into this category
2. Extremes/Skills: value in showing skill and lifestyle to other people, possibly sharing the same extreme skill
3. Control/Reassurance: value in keeping an eye on somebody (close) and receiving reassurance through this information. This may also evolve into a negative scenario)
4. Past Experience/History Reviewer: value in reexperiencing a past context in order to revive memories. Sensecam [1] fits into this category.
5. Private Moment: private moments and privacy are an important aspect when considering a system that (constantly) (autonomously) transmits information
6. Explore/Understand: value in experiencing a different lifestyle, culture or place to understand or explore). Virtual traveling as suggested in Photo Tourism [8] would fit here.
7. Practical information: value in interpretation of context to derive practical information like: "he's already in his car so he will be home in 30 minutes")

The value of sending a context to another person over not sending the context, but concrete information is that concrete information is just words which can for instance be misinterpreted. A context tells something about someone's situation in more than what he or she could tell by words. Since words are the mainstream of communication these days, that is what we are used to. We are not aware of that there is much more communication possible on a more subtle way than words, for instance with a context which is sent. A context tells something about how a person feels, what type of situation he or she is in and whether he or she is alright. Sometimes people just want to know someone else is fine and no specific words are needed, but just a feeling or at least a more abstract message should be sent. Words are concrete and not applicable for a more high abstract level of messaging on someone's context and thus feelings and situation.

The surrounding can affect the emotions of the user that is in that surrounding. On the other hand, the user can also affect the people and the activity in the surrounding. There is an interaction between the surrounding and the people in that surrounding, which in total forms the value of context.

The value of context is for building the connection to other people, objects and self recognition. The connection can be enriched by exchanging and sharing. The connection can also be built by receiving context from others consciously or unconsciously.

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3.3 Literature study

3.3.1 Design guidelines

Extracted from Tollmar et al. (2000):

- Retain ties with everyday life through field research
- Explore sensorial modalities, in the Messenger System it is the visual
- Flexible in use, allow for expression, creativity and development of visual language by the user
- Convey impressions of presence and concern; express intention and emotion
- Richness can be found in the mapping between input of the activity and its expression

Extracted from Hindus et al. (2001):

- Intentionality and aesthetics of the artifact can make the product attractive and acceptable
- Express just enough meaning but not too much; respect the value of perceived simplicity as well as the need for enough information
- Provide control
- Social interaction should not be imposed on users; users already feel increasingly obliged to keep in touch, and can see added communication as extra responsibilities

3.3.2 Conclusions Master Students

Random conclusions

- Pursuing intimacy and connectedness provides the most opportunities for 'always on' abstracted contextual media to be of added value. All other categories require more detailed information that misses the point in this project, or they are too specific. As a result we can say that it would be wise to focus the project as such that we demonstrate the value of contextual media with connectedness as the embodying theme.
- Elements of a context: visual language (speed of displacement, type of displacement, color pallet, lighting), sounds (background, people) and motions.
- Intentionality is an important aspect for communication to work. The initiative for the exploration of another one's context should lay in hands of the user.
- Even when no direct information exchange is taking place, people want to maintain connection with others, outside the context of specific events of information exchange.
- The here and now is important. Otherwise the whole thing loses its point. If the contextual media is not presented in real time the whole thing loses its meaning. Feeling of connectedness is created through a real time always on contextual link.
- Based on interviewing 3 students:
 - After asking the participants to write down their most valuable people they usually first noted down their partner secondly parents, sisters and brothers and lastly very good friends.
 - Eventually family is very important but in terms of communication is less intimate than the communication between partners or very good friends.

3.33 Paper study

Interaction and Outeraction: Instant Messaging in Action
Bonnie A. Nardi, Steve Whittaker, Erin Bradner

This paper is about the use and effectiveness of instant messaging in a work environment. Recent empirical work has shown the importance of informal workplace communication for effective collaboration. By informal we mean interactions that are generally impromptu, brief, context-rich and dyadic.

These interactions support joint problem solving, coordination, social bonding, and social learning—all of which are essential for complex collaboration. These advantages are less with instant messaging. Particular the social context is missing, because with instant messaging, there is a lack of face to face communication. There are also advantages of instant messaging, it can be used for short questions, clarifications, coordination and scheduling and arranging meetings.

Living Networked On and Off Line, 1999
Barry Wellman and Keith Hampton

It is the shift from living in 'little boxes' to living in networked societies. People behave different when they are interacting with one other via de computer or in real life. Interacting on long distances via computers (with people you do not know), has reduced the identity and pressures of belonging to groups while increasing opportunity, contingency, globalization, and uncertainty through participation in social networks.

The Conference Assistant: Combining Context Awareness with Wearable Computing

Anind K. Dey, Daniel Salber, Gregory D. Abowd, Masayasu Futakawa

In this paper, human-computer interaction is a central discussing point. Context is explained as a specific time or location that can be used as an input for wearable computing. This is a different context, than probably could be used in our own project.

In human-computer interaction, there is very little shared context between the human and the computer. Context in human-computer interaction includes any relevant information about the entities in the interaction between the user and computer, including the user and computer themselves. By improving computers' access to context, we increase the richness of communication in human-computer interaction and make it possible to produce more useful computational services. Furthermore, a context aware application, the 'Conference Assistant' is explained.

Context Awareness in Information Logistics, 2005
Sandra Haseloff

The paper is mainly about exchanging information between humans and computers; and how context can affect the information and interaction. In the paper, they dig deeper in the lack of communication between humans and computers; and how context can solve this problem. Context is explained by a combination of the following terms: human language, background and situation of the human that is interacting with the computer and the world the human is part of. In the paper is searched for sensors that could perceive the context a human is in. Information logistics aims to optimize information supply to users' demands. One of the dimensions that significantly affect information demands is the dimension of context. The pieces of information that are relevant to a user and the optimal way of supplying them are frequently determined by contextual factors.

Towards a Better Understanding of Context and Context-Awareness, 1999

Gregory D. Abowd and Anind K. Dey

In this paper, research is presented in understanding context and developing context-aware applications. Context is explained as information that can be used to characterize the situation of an entity, where an entity can be a person, place, or physical or computational object. Context-awareness or context-aware computing is explained as the use of context to provide task-relevant information and/or services to a user.

When humans talk with humans, they are able to use implicit situational information, or context, to increase the conversational bandwidth. Unfortunately, this ability to convey ideas does not transfer well to humans interacting with computers. In traditional interactive computing, users have an impoverished mechanism for providing input to computers. By improving the computers access to context, we increase the richness of communication in human-computer interaction and make it possible to produce more useful computational services. The use of context is increasingly important in the fields of handheld and ubiquitous computing, where the user's context is changing rapidly.

Context-Awareness in Wearable and Ubiquitous Computing, 1998
D. Abowd, A.K. Dey, R. Orr, J. Brotherton

Context-aware computing is defined as any attempt to use knowledge of a users' physical, social, informational and even emotional state as input to adapt the behavior of one or more computational services. Different project about wearable and ubiquitous computing are explained.

Building Common Ground for Face to Face Interactions by Sharing Mobile Device Context, 2006

Vassilis Kostakos, Eamonn O'Neill, Anuroop Shahi

The aim of the mobile device in this paper is to assist users in building common ground by means of identifying shared context. In this case, context is explained as (shared) knowledge, assumptions and beliefs. They try to assist, the human ability to communicate with other humans within physical proximity. There are of course many different elements of common ground or shared context. For the purpose in this paper, the shared context is already stored in users' address books.

Context Awareness Perspectives for Mobile Personal Media, 2005
Antti Aaltonen, Pertti Huuskonen, Juha Lehtikoinen

In this article context awareness refers to an approach in which context information is applied to the users' benefit. Essentially, it is a question of knowing where the user is, what he or she is currently doing or about to do, the states of the user and the environment, and the relationship between these two. Finally, context awareness also requires that the obtained knowledge assist users in performing their tasks more efficiently and in reaching their goals.

Because computing (and communication) devices are now moving with people, it is increasingly important for the devices to have some understanding of the situations their users encounter. Decoding this 'user context' is a key to improving usability by decreasing the need for user input and reducing perceived complexity.

3.34 Related design

It is quite hard to find the related design directly. So I try to search the design the other way around from the definition.

-- The influence of context parameters on language use or discourse is usually studied in terms of language variation, style or register (see *Stylistics*). The basic assumption here is that language users adapt the properties of their language use (such as intonation, lexical choice, syntax, and other aspects of formulation) to the current communicative situation. In this sense, language use or discourse may be called more or less 'appropriate' in a given context. It is the language or derivative terms surrounding set paragraph, novel or article.

Personal

All kinds of online chatting software which like: Msn, Skype and etc and including their accessories.

Mobile phones include short range communication tools

Webcam or video phone calls

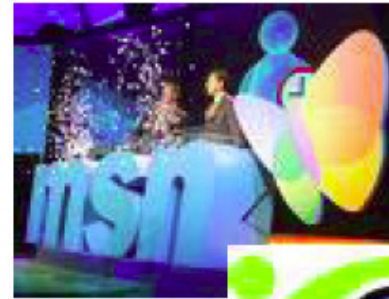
Message board or even post-it

Letters or emails

Social

Media, internet, newspaper even books are influencing people's recognition of value, style and their behavior which can also be consider as a tools for exchanging the context information.

Gaming device which like joy stick and other accessories



3.41 Scenarios

--based upon moodboard values and different factors within context

The sender is indicated with (s) and the receiver is indicated with (r)

Family/Relationship

Scenario 1: A wife (r) is at home and her husband (s) is on a trip.

Value: She wants to know if he is secure, they want to have a feeling of being together.

Factors: emotional atmosphere, environmental experience

Scenario 2: Parents (s) are having dinner at a restaurant and their child (r) is at home.

Value: feeling of being secure and being together.

Factors: emotional atmosphere, environmental experience.

Work

Scenario 1: two managers which have to cooperate and are of different companies. (Can be both sender and receiver)

Value: improving and controlling

Factors: personal status/activity

Scenario 2: A secretary (r) is waiting for his boss (s).

Value: controlling and adapting

Factors: personal status/activity and social load (active)

Social

Scenario 1: A person (r) wants to know how a friend (s) is doing who is on a date.

Value: sharing and involving

Factors: emotional atmosphere

Scenario 2: A person (r) wants to know how her friend (s) abroad is doing.

Value: communicating, sharing and bonding

Factors: visuals, personal status/activity and emotional atmosphere

Home

Scenario 1: There are two roommates. One is at home (s) and one is at school (r).

Value: comforting, familiar and reassuring

Factors: sound, social load and visuals

Scenario 2: A wife is at home (s) and the husband (r) is on a business trip.

Value: reassuring, comforting and familiar

Factors: environmental experience, emotional atmosphere, sounds and visuals.

Leisure

Scenario 1: A friend (s) is drinking and hanging in a pub and his friend is at home.

Value: enjoying

Factors: social load, emotional, sound and visuals

Scenario 2: someone (s) is lying in the sun in her backyard while reading a book and her friend (r) is at work.

Value: relaxing and enjoying

Factors: environmental experience sounds and visuals.

Travel

Scenario 1: one person (s) is travelling somewhere and someone else (r) is anywhere else.

Value: transporting

Factors: motion, visuals and sound

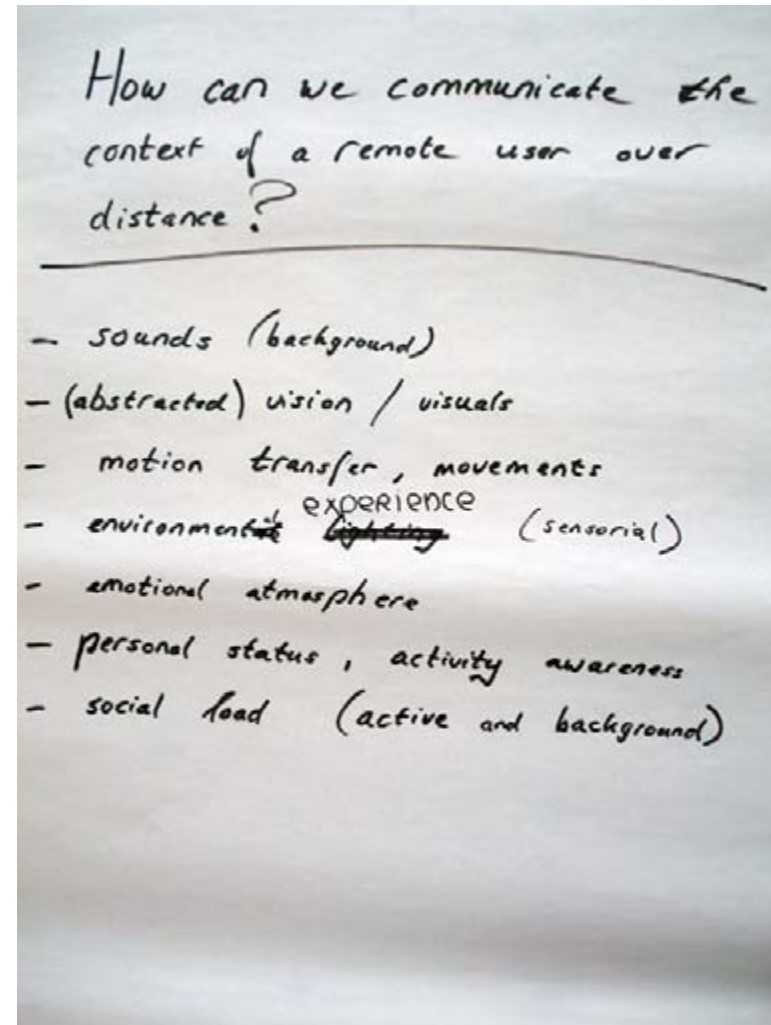


3.4.2 Conclusion

When a person is on a leisure context, sounds and visuals are important to communicate this person's context to show relaxing and enjoying. In a home context, are sounds and visuals mainly important to communicate the comfort, familiarity and reassurance to another person. In a social environment, the emotional aspect is very important to share with each other. When you want to communicate your work context, it is important to show you are controlling by your personal status or activity. When you are in a family or relationship context you want to communicate you are secure and want a feeling of being together by your emotional atmosphere and the environmental experience. When you are in a travel context and you are transporting, this is communicated by motions, sounds and visuals.

3.5 Brainstorm

We didn't want to restrict ourselves from the beginning so that we didn't choose any specific scenario. The brainstorm session was expanded by the carriers but the scenarios. We have used brutethinking, mind map and lotusblossom to create more ideas.



same soul of taste

tears let upper context

brain-reader

Context displayed in keys

'reads' context

public context
 billboard (advertising)

personal context
 language

10

TASTE + the CONTEXT

want to try a new context?
 taste it!

vision => sound (music)

context-smoke machine

2-way watch

yesterday-hat

screen displaying yesterday's context

partners-watch
 Context Plant

Plant changes dependent of context

Project Company identity visible on building

Shape context

influences the environment by what people do in it. (interior)
 For instance in a club:

a lot of bar activity

touch-surface-glove

feels what causes user's feeling

Transfer texture

Back-up Context
 Collect the context of your own and experience it later

Taste Switcher

Switch the taste of the food

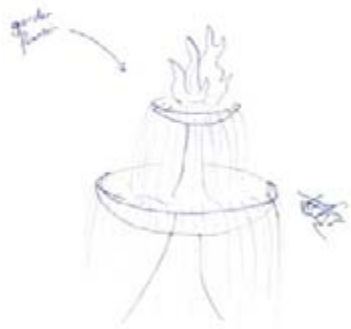
Context Interactor

Build connection between two person who have similar context

movement of \pm

Context coat

Water & Fire contextual art-piece ①



Comparison of sides
transited to amount
of water & fire
cold & pure water
warm & pure fire

Digital Content Window ⑤



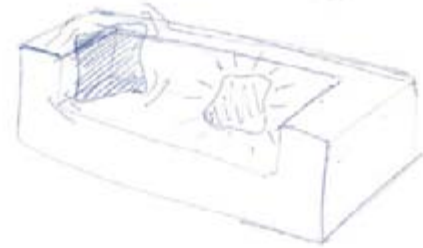
digital window as line
display content view



real window as content frame (to make for use)

Context pillows ④

pillow community
the other
- side
- windows
- walls
- ground
} replace for use



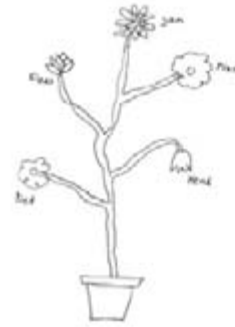
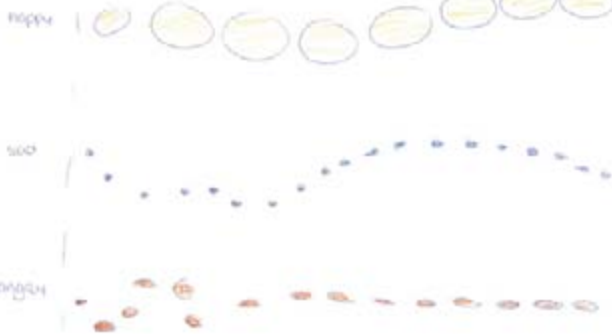
Influence-able tattoo ②



tattoo that comes from out of communication
interaction of some or the
together create a tattoo

EMOTIONAL CONTEXT PATHS ⑥

what's your face says something about how you feel



Plant with flowers
that represent
your contacts and
their activity or
status

Shadows (Schimmen spiel) ③



social feed as base



translated to shadows on the wall
Schimmen spiel (Schimmern)

MOVE THE OBJECTS, CHANGE CONTEXT ⑦

person changes the physical setting



person sees that it changes



PATTERNED PATHS



Through glasses you
only can see motion and
patterns of others on the
wall



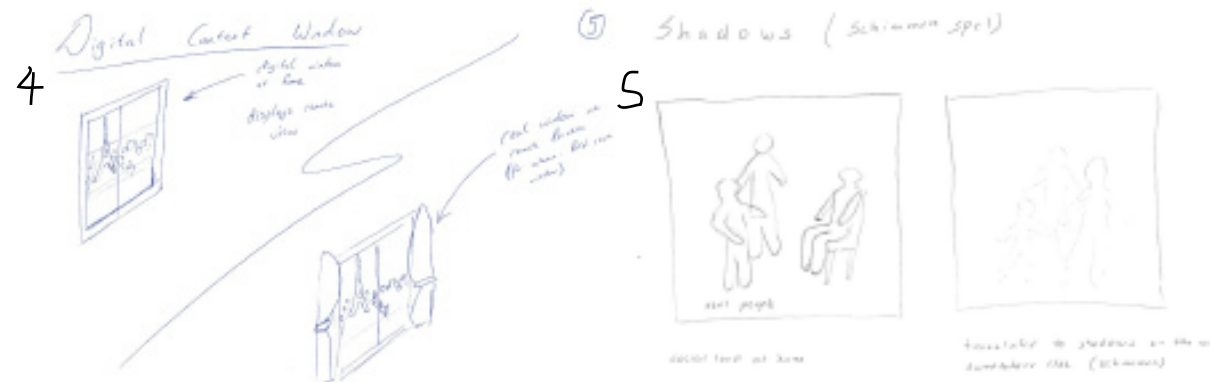
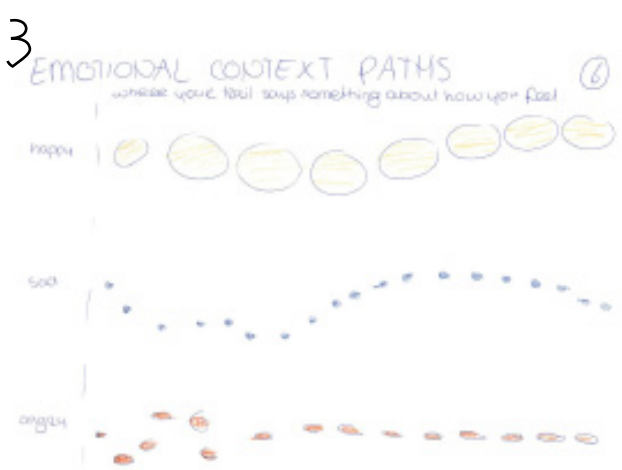
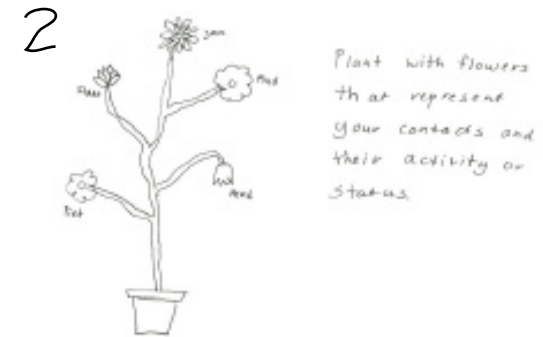
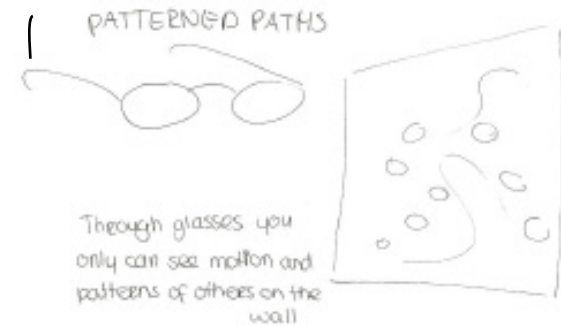


3.6 Idea selection

The 'Lotus blossom' brainstorm and a drawing brainstorm led to various ideas of contextual information exchange. To guide these ideas to the scenarios we came up with, we decided to combine different ideas out of the brainstorms. To do this, we selected the following ideas as a start for our concepts.

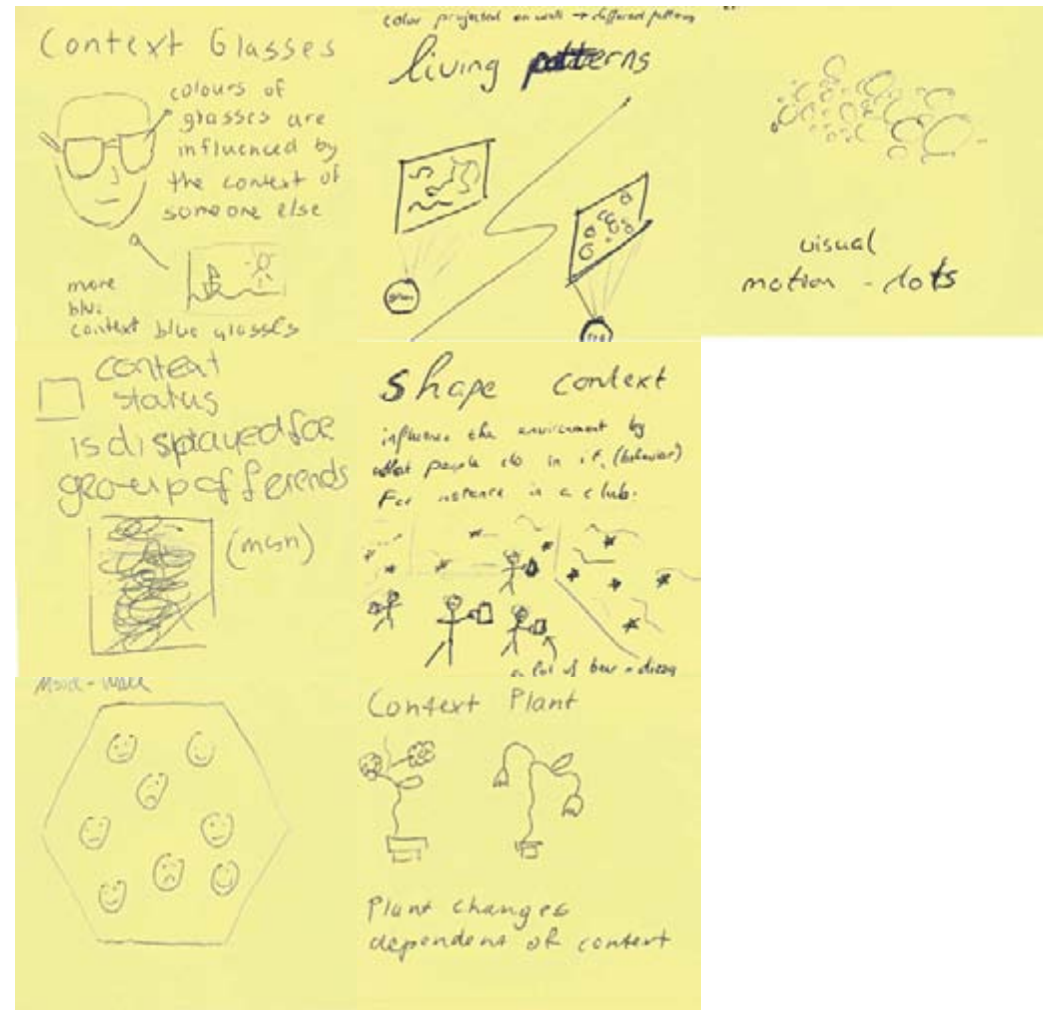
Drawing brainstorm

- (1). Patterned paths idea, through the glasses you can see motion and patterns of the senders.
- (2). Plant idea, a (digital) plant with flowers that represent your contacts and their activity or status. (Closed flower can represent sleep for example.)
- (3). Emotional context paths idea, persons can leave a trail of dots on the floor. The dots represent the context or emotion the person is in. The trail says something about how you feel.
- (4). Digital context window idea, the sender sends his window view to the receiver, which can see the view on a digital window. This way a part of the (visual) context is transferred to the receiver.
- (5). Shadow idea, the sender sends the silhouettes of persons on that place to the receiver. At the place of the receiver those silhouettes are projected on the wall as shadows. This way to social load and activity are displayed at the receiver's home.



Lotus blossom

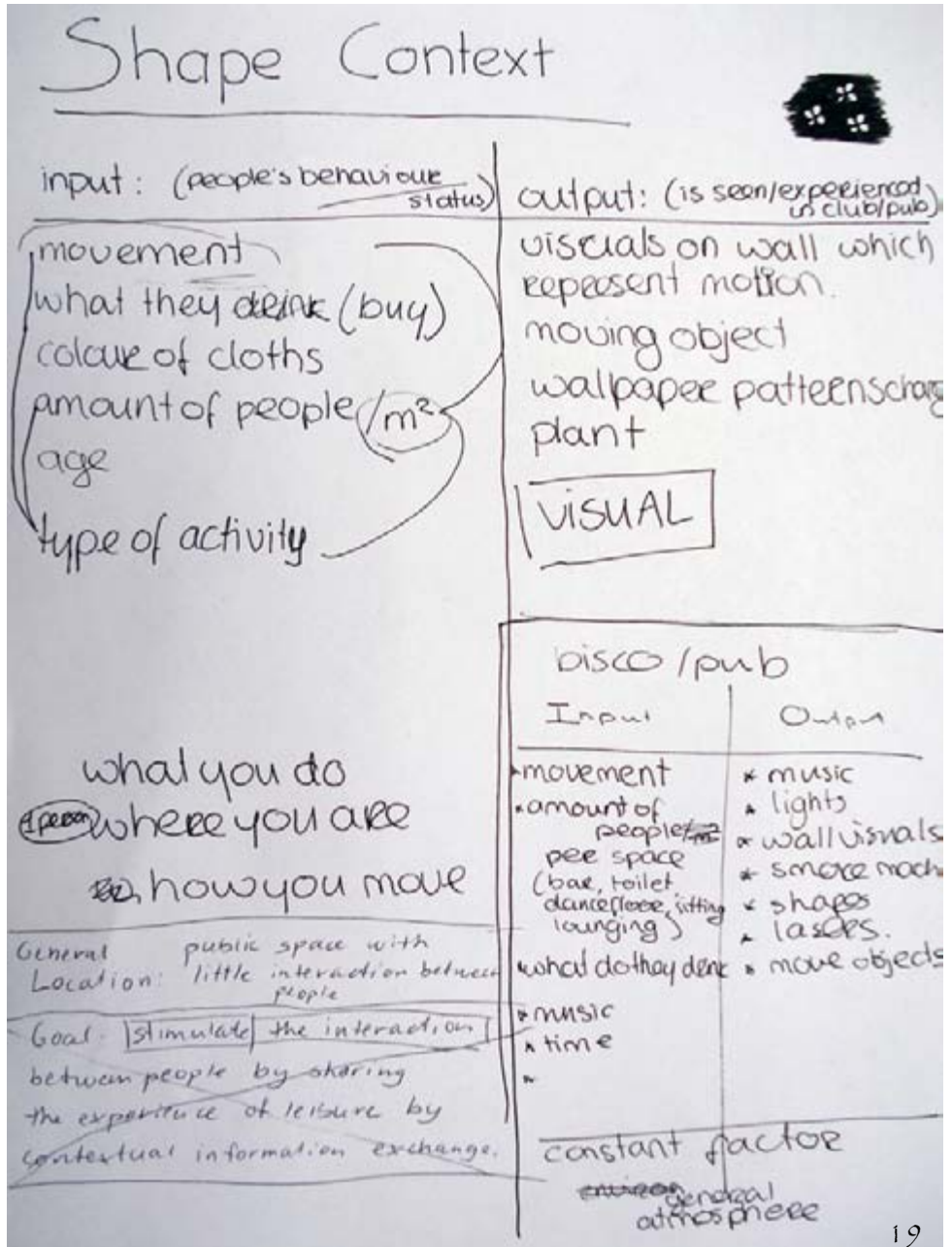
- (1). The colour of the context glasses changes dependent for the context of someone else. Example: the sender is on the beach, the glasses of the receiver colour blue.
- (2). Context status on MSN is displayed on the background of the text window.
- (3). Wall with faces of different contacts, which displays context.
- (4). Dots that are displayed on the floor, that change dependent of someone's context and motion.
- (5). Shape context idea, is that people can change their own environment by their behaviour. In a club, the amount of drinks people buy will change the visuals on the wall for example.
- (6). Plant that can show to the receiver the context of the sender. The plant changes dependent of the context, when the person is awake or feeling happy, the flowers are open (left picture) when someone is sleeping or sad the right picture can be shown.
- (7). Living patterns idea. The colour that is projected on the wall will change the pattern on the wall. This pattern is only visible when a specific colour is projected to the wall.



3.7 Select scenarios

We start to choose scenarios and values from the mood board in order to choose our final concept. More detail information can be seen from the graph next page. We changed our problem statement into "How can we share the experience of enjoyment and relaxation of leisure through visuals, motions and the environmental sensorial experience?"

The final scenario we chose is leisure since we think it concerns more factors and it will be a good example for our further development. The place which we decided was a pub. Then we start to think about what can be the inputs and what can be the outputs.



	one scenario	Factors						
	two scenarios							
Categories	Values	Sounds	Visuals	Motion	Environmental Experience (sensorial)	Emotional Atmosphere	Personal status/ Activity Awareness	Social load
Family/ Relationship	Love							
	Secure							
	Intimacy							
	Appreciation							
	Support							
Work	Skills							
	Improving							
	Self-actualizing							
	Adapting							
	Controlling							
Leisure	Energizing							
	Relaxing							
	Enjoying							
	Self-releasing							
Social	Communicating							
	Involving							
	Sharing							
	Bonding							
Home	Living							
	Reassuring							
	Recharging							
	Privacy							
	Central							
	Familiar							
	Comfort zone							
Travel	Freedom							
	Ongoing							
	Exploring							
	Transporting							
	Rejoining & Separation							

Paths

Imagine, it's evening and you are walking down the street. You walk by several bars and discos and think about how it would be inside those places. The building does not express anything of what's happening inside. You get no connection at all with the indoor context. Wouldn't it be interesting if the context of the people and the atmosphere of a discotheque are communicated to the outside through the building? The paths gives you this contextual communication opportunity. The context of the inside is defined by the amount of people inside, their type of activity and the atmosphere of the club itself (for instance type of music and lights used). This is translated into visuals which form a path in front of the building. When walking by the building, this path will move with you a bit as a hologram. The visuals represent the context of the inside. Its colour pattern stand for the mood and type of activity people do, and the amount of differences in colour and amount of circles represent the busyness and the atmosphere of the club. This way, when you walk by, you get an impression of the inside context.



Relax Atmosphere



Pleasant Atmosphere



Busy Atmosphere

Projection

Imagine, it's evening and you are walking down the street. You walk by several bars and discos and think about how it would be inside those places. The building does not express anything of what's happening inside. You get no connection at all with the indoor context. Wouldn't it be interesting if the context of the people and the atmosphere of a discotheque are communicated to the outside through the building? Shaping gives you this contextual communication opportunity.

The context of the inside is defined by the amount of people inside, their type of activity and the atmosphere of the club itself (for instance type of music and lights used). This is translated into blocks that are projected on the building. The blocks itself represent the amount of people that are in the building. The colour of the blocks stand for the activity that those people are doing (sitting, dancing, drinking etc.). This way, when you walk by, you get an impression of the inside context.



Relax Atmosphere



Pleasant Atmosphere



Busy Atmosphere

Wheels

Imagine, it's evening and you are walking down the street. You walk by several bars and discos and think about how it would be inside those places. The building does not express anything of what's happening inside. You get no connection at all with the indoor context. Wouldn't it be interesting if the context of the people and the atmosphere of a discotheque are communicated to the outside through the building? These wheels gives you this contextual communication opportunity. The context of the inside is defined by the **amount of people** inside, their **type of activity** and the **atmosphere** of the club itself. The wheel is a physical object which communicates the context inside the pub to the outside. The speed of the rotation represents the music inside more or less like an equalizer. The color of the wheels will also change according to atmosphere inside the pub. The direction of the wheel will change according to the adaption of the pub like more people are joining or leaving. In this way you can easily feel the context inside the pub and probably you would like to join them to influence the context yourself.



Example Atmosphere

Silhouettes

Imagine, it's evening and you are walking down the street. You walk by several bars and discos and think about how it would be inside those places. The building does not express anything of what's happening inside. You get no connection at all with the indoor context. Wouldn't it be interesting if the context of the people and the atmosphere of a discotheque are communicated to the outside through the building? Shaping gives you this contextual communication opportunity. The context of the inside is defined by the amount of people inside, their type of activity and the atmosphere of the club itself (for instance type of music and lights used). This is translated into visuals that are displayed on screens on the outside of the windows. These visuals simulate silhouettes, which represent the amount of people and their activity in a coloured surrounding. This way, when you walk by, you get an impression of the inside context.



Relax Atmosphere



Pleasant Atmosphere



Busy Atmosphere

3.9 User research

From the first part of the user research, it can be concluded that people can identify the context of the inside of the building better with the silhouettes concept, since the silhouettes resemble real people and activities.

The most favorite concept was the silhouettes concept, since it represents clearly the inside context. Paths on the other hand is not favorite, since you can not see the path when it is busy on the street. The wheels and projection are also less favorite, because the context of the inside is not immediately clear to people walking by. Though the growth of the projection was clear, but not when walking by, you'd have to look at it a bit longer, or have seen it before.

From this can be concluded that the silhouettes concept is most suitable for our problem statement. (How can we share the experience of enjoyment and relaxation of leisure through visuals, motions and environmental sensorial experience?)

(More detailed data can be found in Appendix A)

3.10 Final prototype

There was no sophisticated prototype during this iteration due to the time limitation. The prototype we used for presentation was the poster above.

3.11 Evaluation of [Iteration]

Research:

We researched upon what is context about. From this we could make the factors. We also read the reports of the masters. These helped us to come up with the values, which we derived from our moodboard. We also researched upon information exchange and context awareness. We however did not use this, since the found information was too broad to apply within this process. We also found some existing designs upon contextual information exchange, but did not apply what we found. Maybe we should have looked more for information exchange, but it was hard to find any literature which was not on computer.

There are a lot of possible design research processes with researching and defining a problem statement and making scenarios. The way we did it was a good order for this project.

The moodboard was helpful to see the different categories within context. It was better if we would have derived them from research, since now we thought of them ourselves. The values helped us to see the different types and this helped us to select our direction.

Making the scenarios helped to give us an overview of which categories were interesting. The values and factors got meaning and we could see interesting combinations which made the choice for direction easier.

We decided which direction we wanted based on the values and our identities, thus what was interesting for us to choose as a group. We made the problem description based on the values and factors and structured them to the essence of the problem.

(Planning and process can be found in Appendix B)

Ideation:

We did the brainstorm too early in the process and therefore it was too broad, because of the broad problem description. We should have done a more specific creative session, for which we needed a more specific problem description first. We selected the ideas upon personal preference and which fitted to the problem description. It would have been better if we would have set requirements and have selected the ideas based upon those. This could have made it easier.

Concept development:

We should have had a complete new brainstorm for sub-ideas of the chosen concept. Then chose again, work it out and get feedback, instead of the four first ideas we came up with. It was good to get feedback from possible users. But we should have asked for more specific and objective feedback for the choice of concept. The pictures did not give a good and full idea of what the concepts were about. A small wizard of Oz would have been more realistic for the users. The user research was not structured and focused. We should have thought of specific criteria. Since we had not done that, the choice for our final concept was not grounded. User research could have been implemented more and sooner within the process.

Final Concept:

We only thought of one way contextual communication, but it is more interesting if we would have thought of a two way contextual information exchange and had included distance. It could have been a requirement. Strong points: a clear communication, recognizable, easily feasible, easily adaptable to another context, the visuals can be anything. Weak points: too concrete, we did no research upon the colours, we just tested the pictures and not for real, just one way communication. It is a nice concept, but there was not enough time to work it out fully, which would have led to better results. We should have been more clear about what exactly is the input and the output.

4. Iteration II

4.1 Approach

Iteration I is the only iteration which worked as a team. I have found a lot of useful information during iteration I. Especially, I learnt how to deal with a inconcrete problem. So, my goal for this iteration will be the following:

- (1). Look into the weakness of iteration and improve it
- (2). Further research about communication
- (3). Define a scenario and work on it
- (4). The outcome should be concrete and can be further developed
- (5). Share the information with other team member
- (6). Evaluate the process every week during PCM

4.2 Research

Value of communication

"A man is as alive as he can communicate," L. Ron Hubbard wrote. And communication is a facet of life which he explored very deeply indeed, ultimately writing hundreds of thousands of words about this vital subject. Communication skills are essential in any sphere of human interaction. In fact, when all is said and done, on whatever level, communication is the sole activity all people share.

What is communication?

In Scientology, communication has been defined – an accomplishment that has led to a much deeper understanding of life itself.

Communication, in essence, is the shift of a particle from one part of space to another part of space. A particle is the thing being communicated. It can be an object, a written message, a spoken word or an idea. In its crudest definition, this is communication.

This simple view of communication leads to the full definition:

Communication is the consideration and action of impelling an impulse or particle from source-point across a distance to receipt-point, with the intention of bringing into being at the receipt-point duplication and understanding of that which emanated from the source-point.

Duplication is the act of reproducing something exactly. Emanated means "came forth."

The formula of communication is cause, distance, effect, with intention, attention and duplication with understanding.

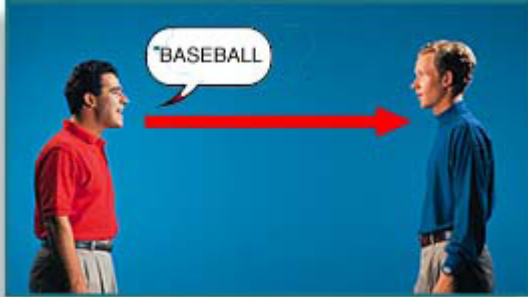
The definition and formula of communication open the door to understanding this subject. By dissecting communication into its component parts, we can view the function of each and thus more clearly understand the whole.



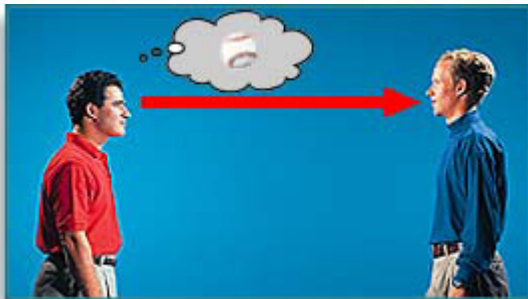
Any communication involves a particle which can be in one of four categories: an object...



... a written message...



... a spoken word...



... or an idea...



Any successful communication contains all the elements shown here. Any failure to communicate can be analyzed against these components to isolate what went wrong.

Other problem can be categorized as:

- Accuracy of the context
- Willingness of receiving context
- Real-time
- Consciously or unconsciously context exchange
- Privacy

Awareness

The definition of awareness:

“An understanding of activities of others, which provides a context for your own activity”

Four type of awareness:

Workplace awareness, which is knowledge of tasks within the virtual environment, availability awareness, which relates to the availability of people and objects, group awareness, which promotes the feeling of belonging to a group, and contextual awareness, which includes physical, social and mental context

Awareness is both a perception of the users of a system, and an aspect of a system that facilitates that perception. Awareness here is not used in the sense of having heard of, nor, in the sense of thinking about someone, but in the sense of experiencing what is believed to be an external perception, whether synchronous or asynchronous. Awareness in this sense must be perceived to be synchronous or near-synchronous.

4.2.1 Application

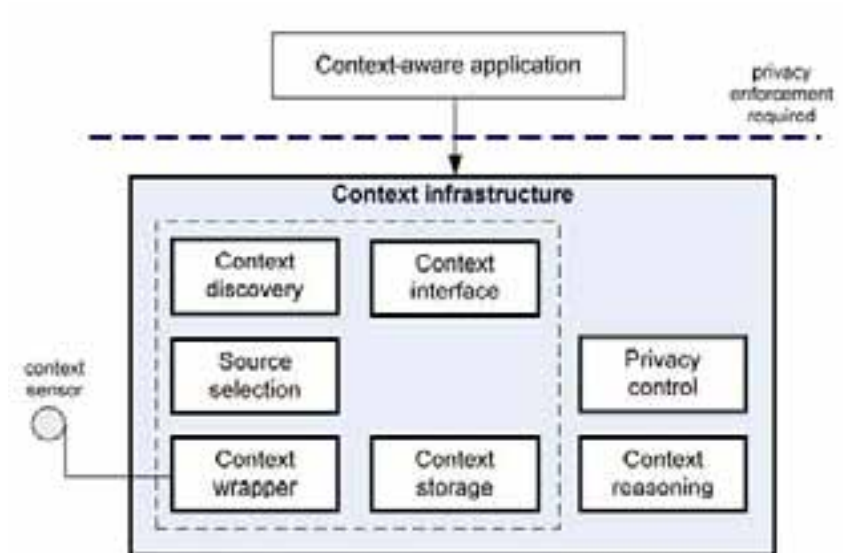


Figure 1.3: Generalized functional view of the context infrastructure.

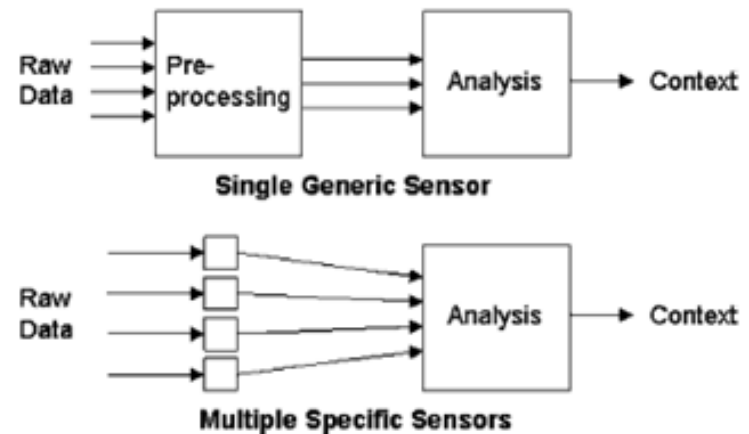


Figure 1. Use of a single generic sensor versus multiple specific sensors for context-awareness (adapted from Van Laerhoven et al. [32]).

4.22 Related design

(1). Real-time emotion mirror

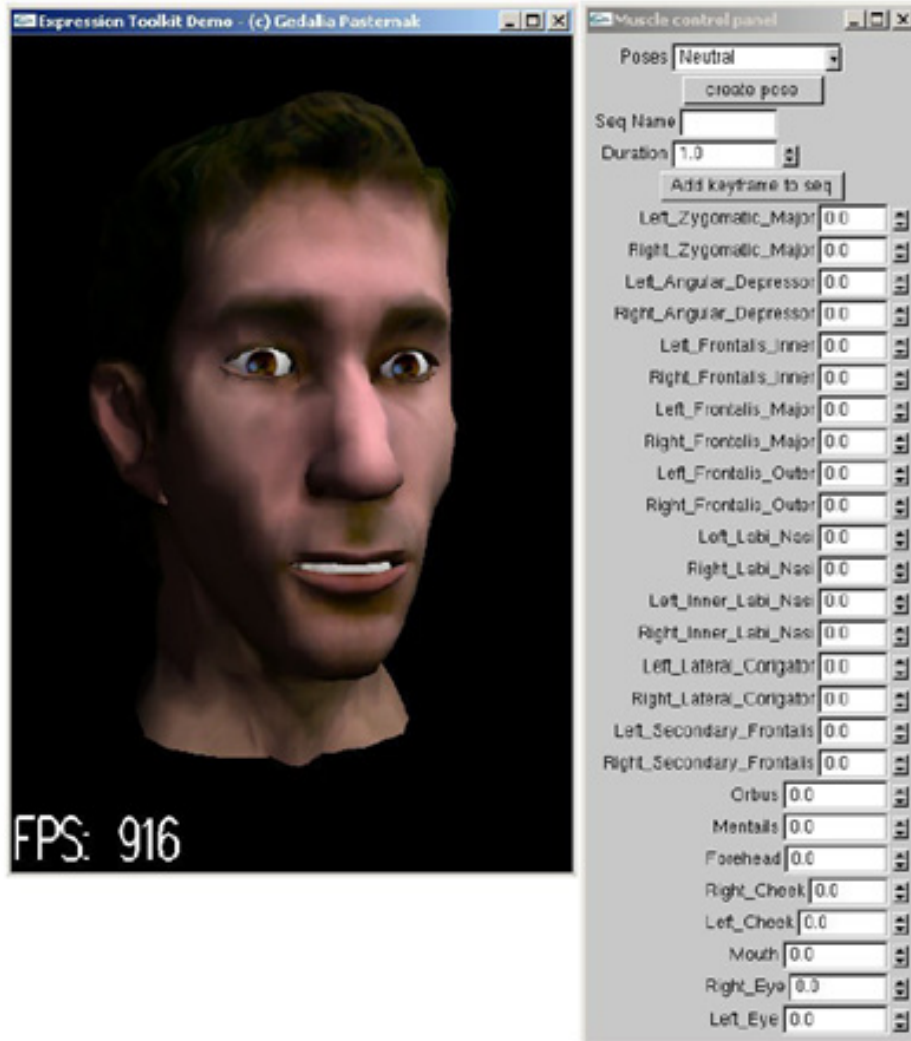


Figure 4 – A screenshot of the Expression Toolkit including the 3D model window and a GUI in which a lot of facial muscles can be manipulated by giving contraction/detraction values.

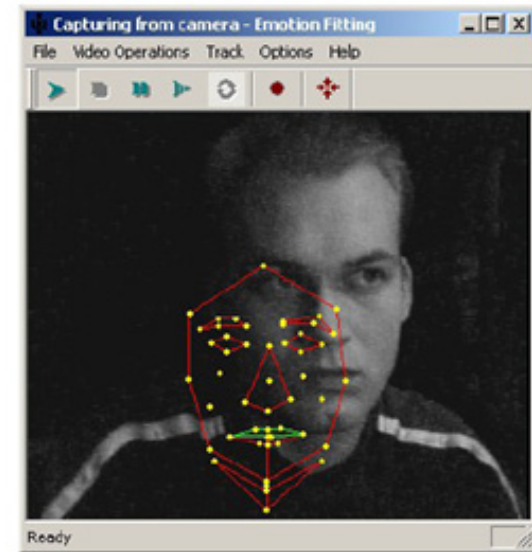


Figure 1 – the initial mask shape before the 'auto-fit mask' feature.

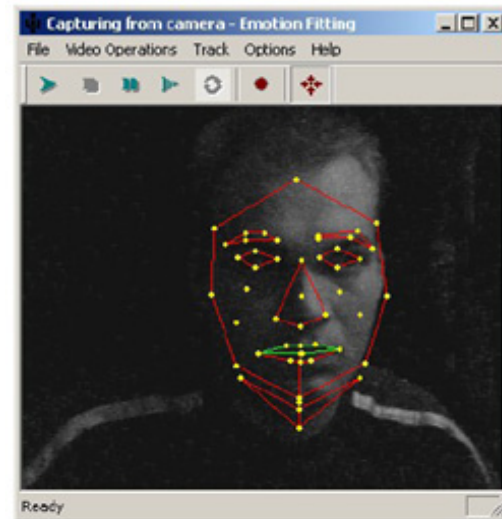


Figure 2 – shape and position of the mask after the 'auto-fit mask' feature.

► **Love Detector Products**



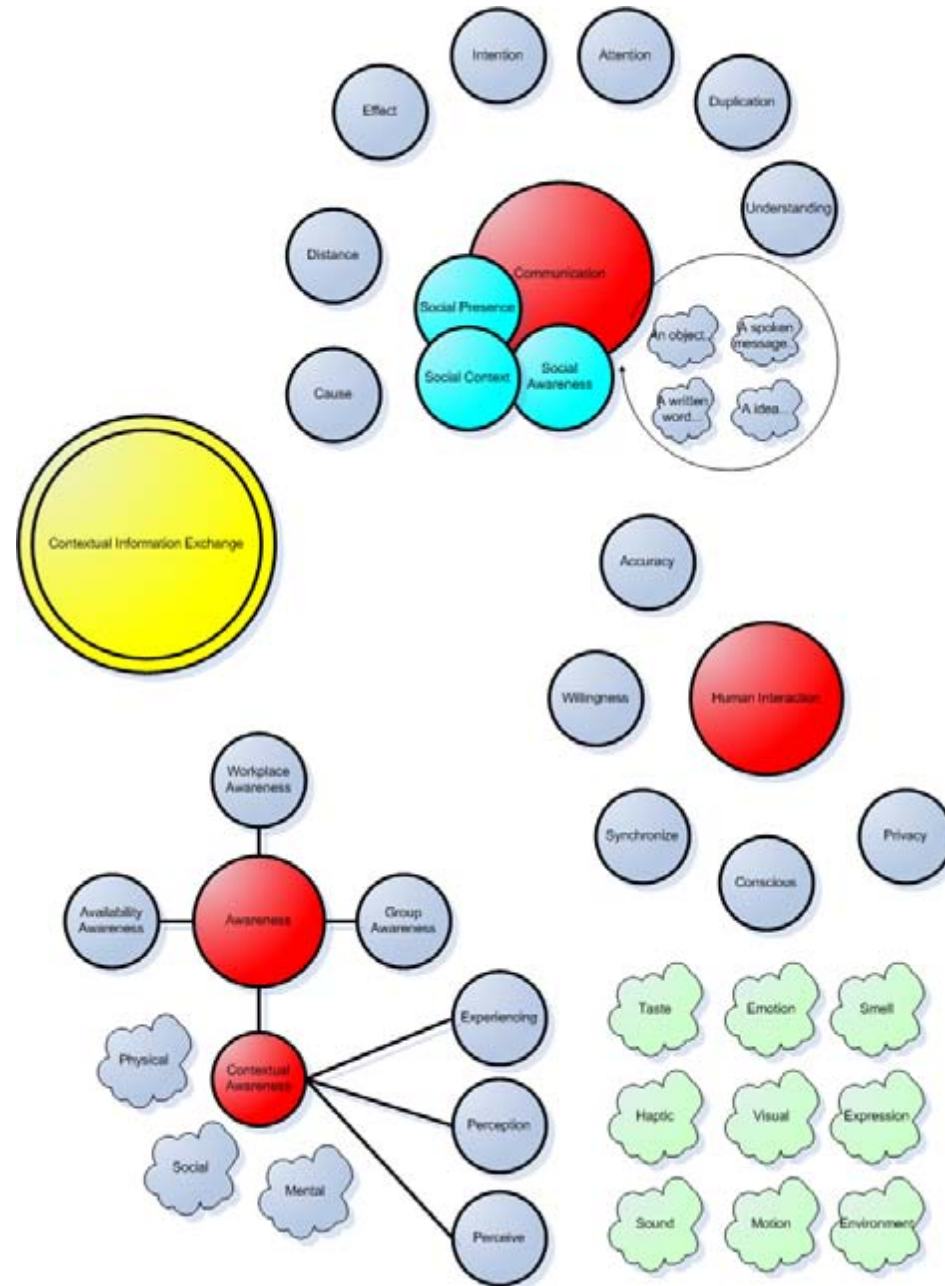
Voice-to-emotion analyzer

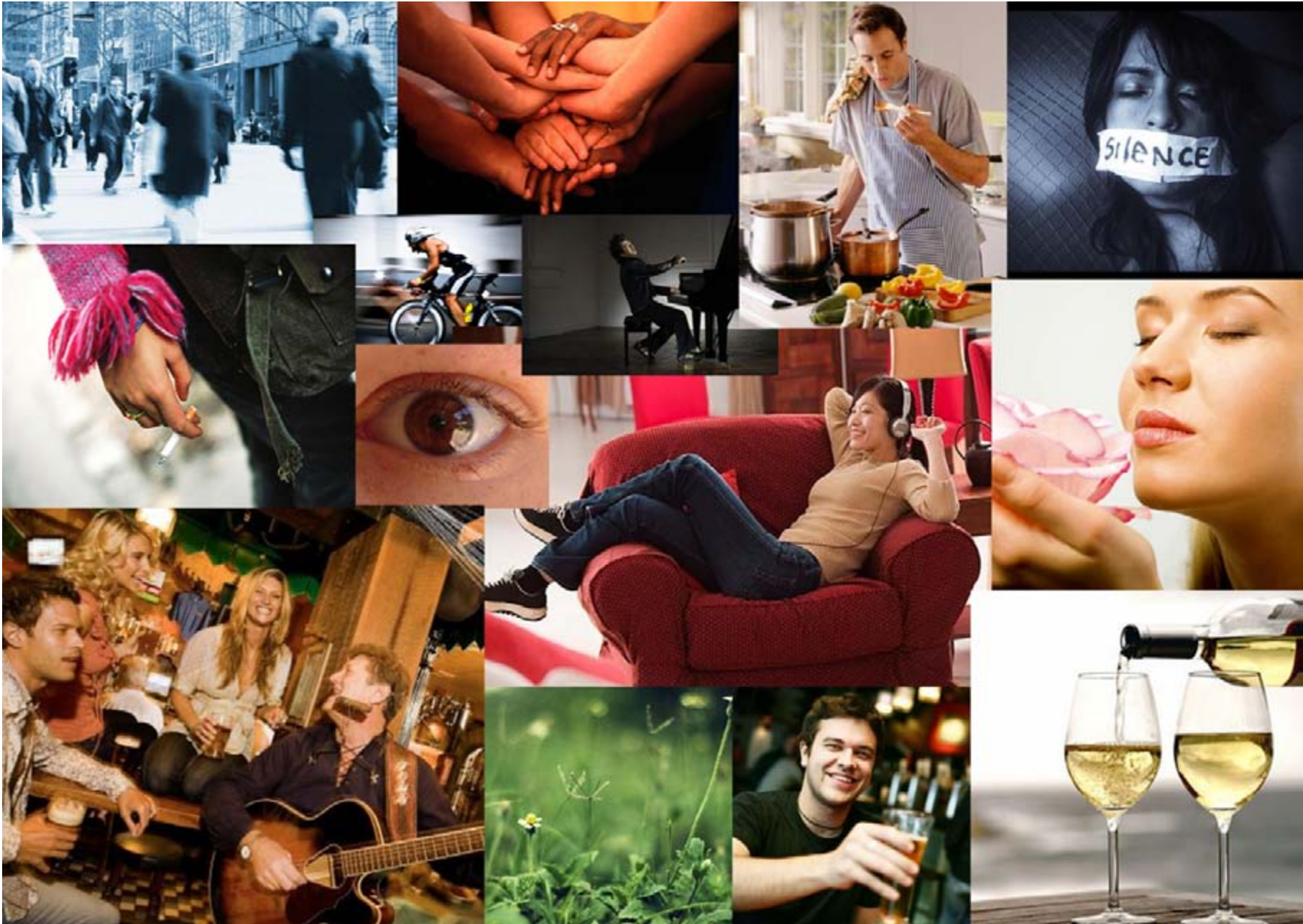
Different emotion reflection

Steven Seagal Emotion Chart

Happy	Sad	Petulant	Lonely
Amused	Skeptical	Furious	Wistful
Confused	Bored	Sarcastic	Regretful
Aroused	Terrified	Proud	Mischievous

4.23 Connection of research





4.3 Mood board

I found out that mood board was specially efficient to define factors from my last iteration. I decide to follow it and define factors which can be used for my brainstorm session.

4.41 Brainstorm session

The brainstorm session fro iteration II will be lotus blossom and mix&match. I defined eight different factors including: function, technology, sensorial, haptic, passive, artistic, business and personal. All the ideas will be selected and further mixed with other ideas in order to create more. I really want to expand ideas logically and see how it works.

Problem Definition

How to improve human interaction to influence their feeling of share, connectedness and social presence by contextual information exchange?

There was still no scenario defined before the brainstorm session. It will be determined by the user research.

Brainstorm Session (Domain Grey, 12:30-13:30 26-03-2009)

Introduction 05 mins

Warm-up (Team) 05 mins

Lotus Blossom (Team) 30 mins

Mix & Match (Two person) 15 mins

Group present (Two Person) 5 mins

Total: 60 mins



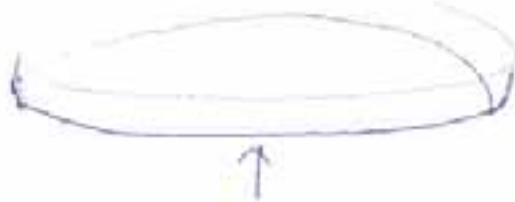
4.51 Four concepts

Concept I

Problem Description:

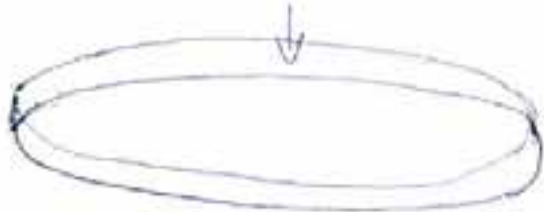
How can I improve human interaction to influence users' context of share, connectedness and social presence by information exchange.

How to improve the feeling of connectedness by sharing the context.



Coil made generate magnetic field when get electricity
The distance can represent the distance between two close people.

Magnetic



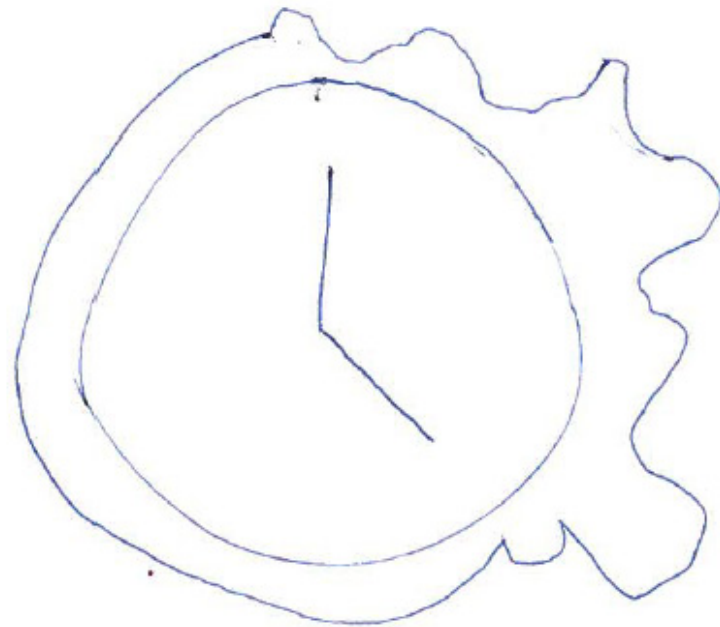
Concept II

Status Flower



use projector to create a status flower
The shape, color and style can represent
different information of remote user.

Concept III. Context shape clock.



use shape to indicate the mood or social load of remote user hourly.

Concept IV Couple Glasses



Fill the water in the couple glass for your friend or lover over distance.

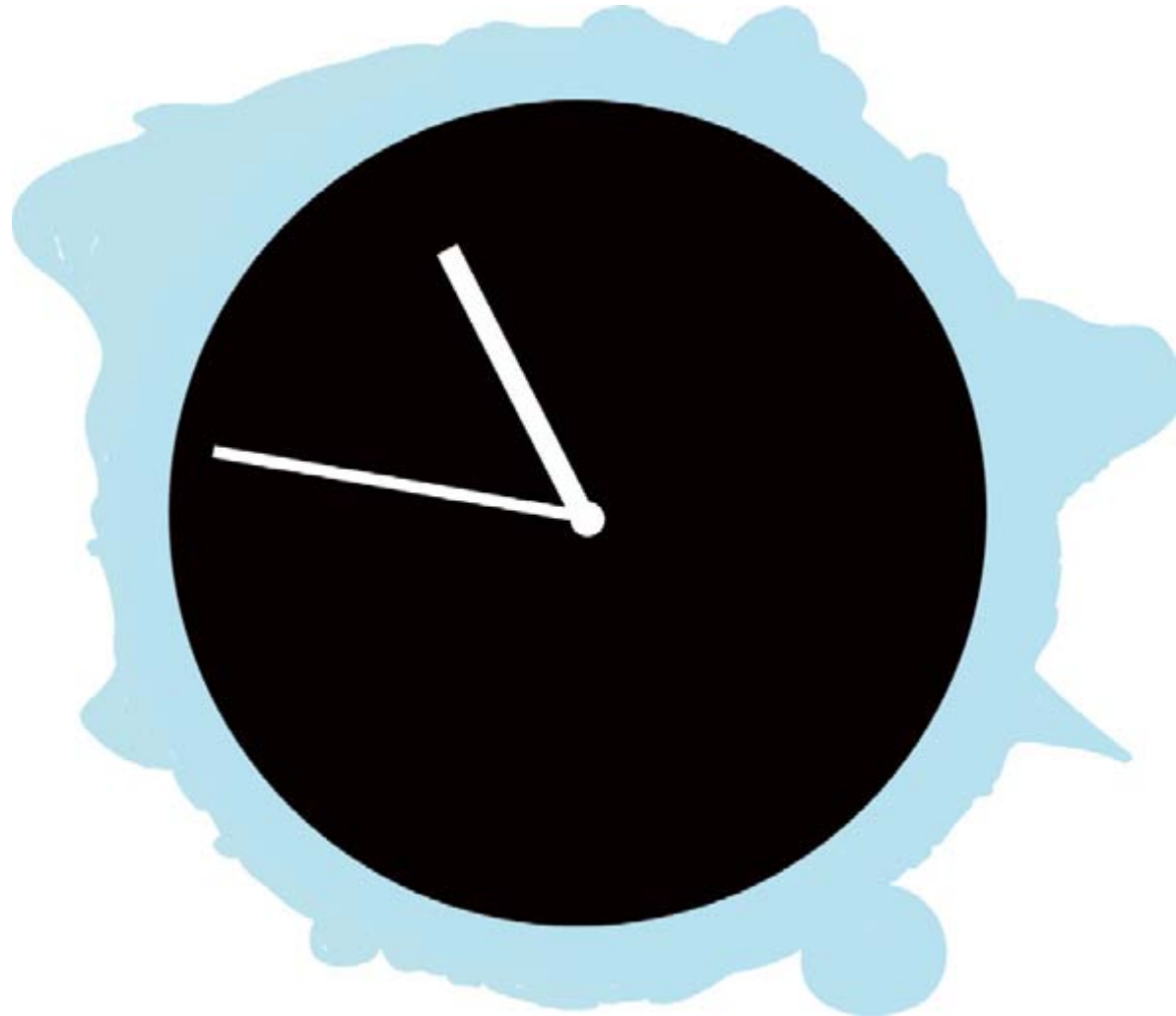
4.52 | Idea selection

I choose six points for evaluate my concept which are innovation, connected feeling, abstracted, interaction, feasibility and extendable. The result is quite clear. I will use context-shape clock as my final concept. The most thing I like from this concept is its extra value. The clock can record the context by the time which means the user is not necessary to receive the context real time. And this point can be further developed in the next iteration.

Idea Selection							
	Innovation	Connected feeling	Abstracted	Interaction	Feasibility	Extendable	Total
Magnetic plate	7	5	6	6	6	6	36
Status Flower	8	7	8	5	4	4	36
Context-shape Clock	8	7	8	7	6	8	44
Couple Glass	6	8	6	7	7	5	39

4.61 Final prototype

There is no way I can make a real model within one week. The prototype I used for exhibition was a movie which explain how this clock works and its value. The input of the clock was not decided since there is no special research to support. I will simply use emotion to explain my concept.



4.71 Evaluation of Iteration II

Research:

I mainly focus on what are communication and the value of communication within this iteration. I think this information is the missing parts from the first iteration. Well, I have done a small user research about the communication status so that I can have a clear overview about the real life communication. However I didn't combine it with my next step. I have also made a mood board about different way of communication. I think it is quite helpful to see the categories and use these factors for the brainstorm session. That's what I learnt from the first iteration.

From the research, I found several missing parts from the last iteration. But some part is still too vague and I didn't specifically look into one similar product and its design process. I think this can be the starting point of my next iteration.

Ideation:

I didn't keep brainstorming with my previous team but with several of my friends since I want more inputs. From the creative session, I feel that my crew was not so efficient that my last team since they feel vague about my problem description and the theme. So I changed the methods and divided into three parts. It works better than I thought. The idea was quite ok and has a lot of potential for further development.

Planning and design process can be found in appendix D

Concept development:

The concept development phase was not good enough due to lack of time. The idea selection phase took longer time than I thought. There are too many parameter and properties have not been decided. The user research has not been organized due to this reason. It was really a pity since some of the feedback from user would really help me decide my next direction. I would get more feedback from exhibition and add another user research in my next iteration. The feedback from the exhibition was not so direct since some of the parameters have not been decided. The user would prefer emotion since they want more direct contact. Emotion has been considered as the main status reflector. But on the other hand, I still doubt whether it is necessary to use emotion in this case. In order to solve this confusion, another objective user research would be necessary in the next iteration.

Final Concept:

I only thought of one way contextual communication, but it is more interesting of I would have thought of other way of contextual information exchange and interaction in between. This could have been a requirement.

Strong points: a clear communication, recognizable, easily feasible, lots of potential, can be viewed later, subjective, sets up more topics or reason.

Weak points: no research upon the shapes, unknown parameters and direction, no direct interaction, not real life

It is a nice concept, but there was not enough time to work it out fully, which would have led to better results. I should have been clearer about what exactly are the input and the output.

5. Interim Exhibition

5.11 Feedback

The feedback from the exhibition was quite handy. Most of the visitor likes my concept specially because of its extra value. The subject is interesting. It is a pity that the parameter of my concept was not decided. Some of the visitor suggest me to organize an user research to find out. The prototype will be even more attractive if it is physical. Most of them are looking forward to the pattern I am going to use for the shape.

6. Iteration III

6.11 Approach

The outcome of iteration II was quite extenable. I am going to focus more on the user research instead of research in order to get more concrete support. Meanwhile I will focus on different pattern, style, interaction of the clock. My last goal is to make a physical model during this iteration.

6.2 Research

6.2.1 Ambient Intelligence

Definition

Ambient Intelligence refers to an exciting new paradigm in information technology, in which people are empowered through a digital environment that is aware of their presence and context, and is sensitive, adaptive, and responsive to their needs, habits, gestures and emotions.

It can be defined as the merger of two important visions and trends: "ubiquitous computing" and "social user interfaces". It builds on advanced networking technologies, which allow robust, ad-hoc networks to be formed by a broad range of mobile devices and other objects (ubiquitous- or pervasive computing). By adding adaptive user-system interaction methods, based on new insights in the way people like to interact with computing devices (social user interfaces), digital environments can be created which improve the quality of life of people by acting on their behalf. These context aware systems combine ubiquitous information, communication, and entertainment with enhanced personalization, natural interaction and intelligence.

What is Ami about?

Ambient Intelligent environments can be characterized by the following basic elements: ubiquity, awareness, intelligence, and natural interaction. Ubiquity refers to a situation in which we are surrounded by a multitude of interconnected embedded systems, which are invisible and moved into the background of our environment. Awareness refers to the ability of the system to locate and recognize objects and people, and their intentions. Intelligence refers to the fact that the digital surrounding is able to analyze the context, adapt itself to the people that live in it, learn from their behavior, and eventually to recognize as well as show emotion. Natural Interaction finally refers to advanced modalities like natural speech- and gesture recognition, as well as speech-synthesis, which will allow a much more human-like communication with the digital environment than is possible today

Digital environments that is sensitive and responsive to the presence of people

Embedded:

Many invisible distributed devices throughout the environment

Context aware:

That knows about their situational state

Personalized:

That can be tailored towards your needs and can recognize you

Adaptive:

That can change in response to you and your environment

Anticipatory:

That anticipates your desires without conscious mediation

Challenge for ambient intelligence:

Interaction:

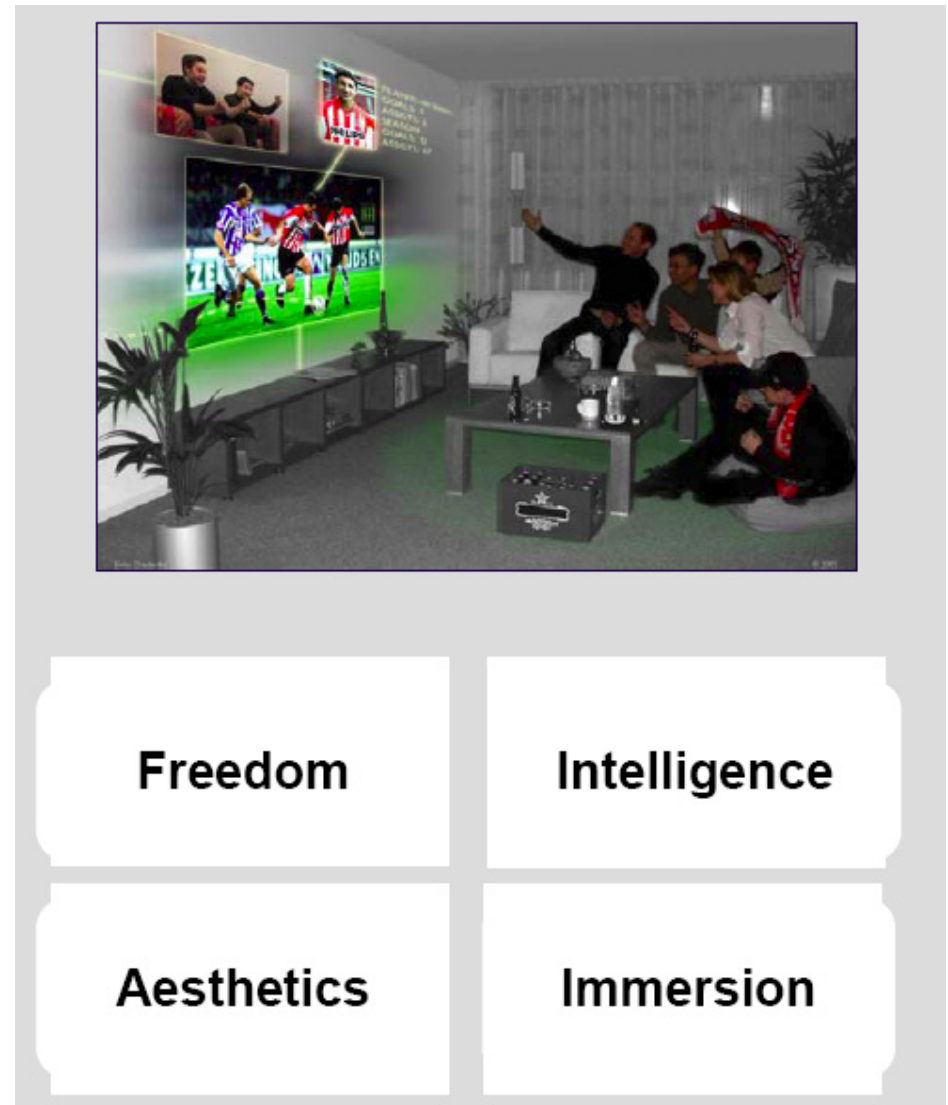
- Integrate multi-modality with context awareness and intuitive feedback mechanisms
- Integrate smart media access into surroundings (audio, video and light)
- Develop interaction concepts for novel Ami technologies

Innovation:

- Involve multiple parties in the user centered design cycle at large
- Concentrate on well-defined business domains (i.e., hospitality, fashion, furniture, well-being, city beautification)
- Develop new business models for Ami innovation

Involvement:

- Involve ordinary people in the user centered design cycle at large
- Let people experience the Ami future and live in it yourselves
- Make Ami part of education



Freedom


Intelligence

Aesthetics


Immersion

6.22 Related design

PHILIPS



PHILIPS



iCat
Interactive user-interface robot

- Emotional feedback
- Interactive control engine
- Tangible object
- Dialogue interface
- Open source software based
- Programmable



MiraVision

Mirror display

- Dual- function Display & TV
- Optimal display brightness (in contrast to classical solution)
- Interactive interface



Ambient Experience

Relaxing clinical environments

- Ambient atmospheres
- Large projections
- NFC tagging
- Persuasive technology

6.23 Clock



Quattro Multi-Function Clock

As the next in Near Near Future's 'Strangely Familiar' series of gadgets, this Quattro prototype alarm is a solid translucent block that has no visible buttons or markings. As the Quattro is rotated, its function changes—on the side it's a radio, tilted up it's an alarm, and horizontally it's a clock, each indicated by a contextual change in the display on the front. It gets better: the Quattro recognizes when you get close and lights up touch-sensitive buttons. Then it gets even better: a wirelessly connected teddy bear triggers the alarm's snooze function when you give it a hug. I want this future very badly.



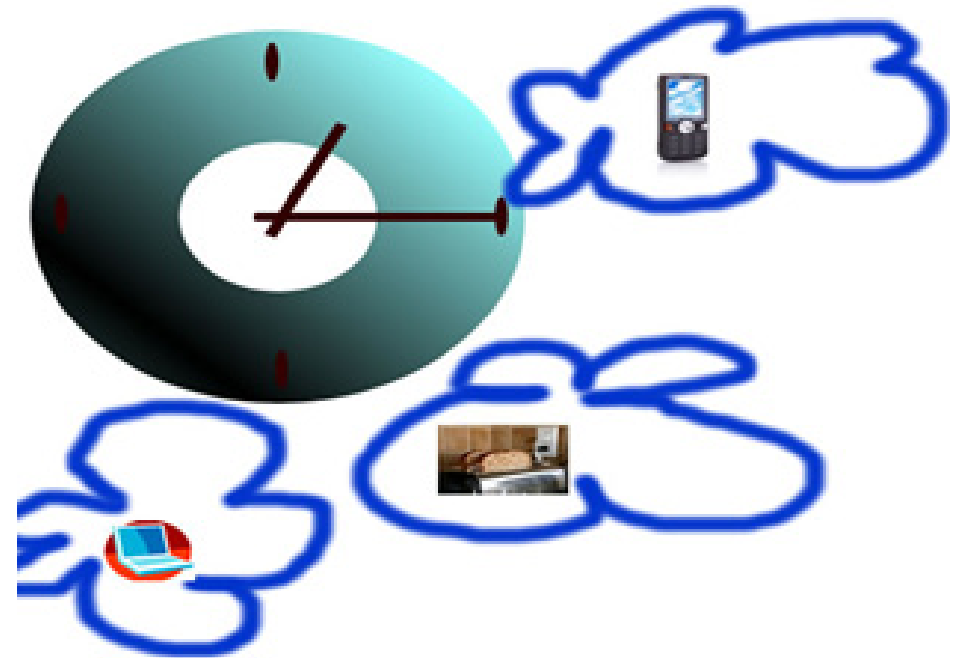
Family awareness clock

A "family-aware clock" which has a hand for each member of the family that points at their location.



Energy AWARE Clock is an electricity meter that resembles an ordinary kitchen clock.

Energy AWARE Clock is designed to make energy awareness a part of everyday life. The clock visualizes the daily energy rhythms of the household and reminds us of the ordinary kitchen clock, both in form, place and use. Take a glance at your Energy AWARE Clock - in the same way you glance at the clock every now and then - and be enlightened. Energy AWARE Clock shows electrical utilization of its environment in real time. If the dishwasher is switched on it shows immediately on the display of the unit. Yesterday's graphs fade away slowly and today's consumption is drawn on top of previous days, making it possible to compare your energy use for several periods.



Clock-talk

Clock Talk is a simple concept of creating a network of devices and systems within a home. The clock acts as the base station and controls the lights, temperature and your morning music. Implemented using Xbee, the clock senses when you wake up and programs these devices to get ready for use. The devices constantly transmit their status to the clock. The instant the user wakes up they are preprogrammed to function for a behaviorally modeled amount of time and then switched off. The clock has a touch interface where all devices it talks to are displayed and can be taken offline with a touch. This project is an exploration of creating a time response system using radio signals.

6.24 Internet of things

Today, developments are rapidly under way to take this phenomenon an important step further, by embedding short-range mobile transceivers into a wide array of additional gadgets and everyday items, enabling new forms of communication between people and things, and between things themselves. A new dimension has been added to the world of information and communication technologies (ICTs): from anytime, any place connectivity for anyone, we will now have connectivity for anything (Figure 1).

Connections will multiply and create an entirely new dynamic network of networks an Internet of Things. The Internet of Things is neither science fiction nor industry hype, but is based on solid technological advances and visions of network ubiquity that are zealously being realized.

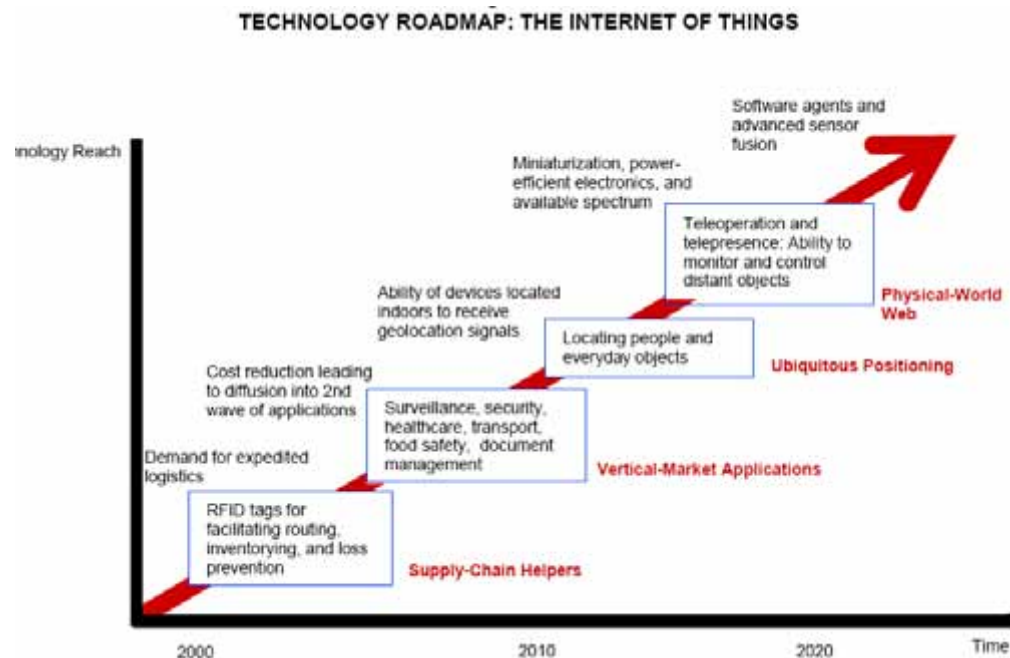
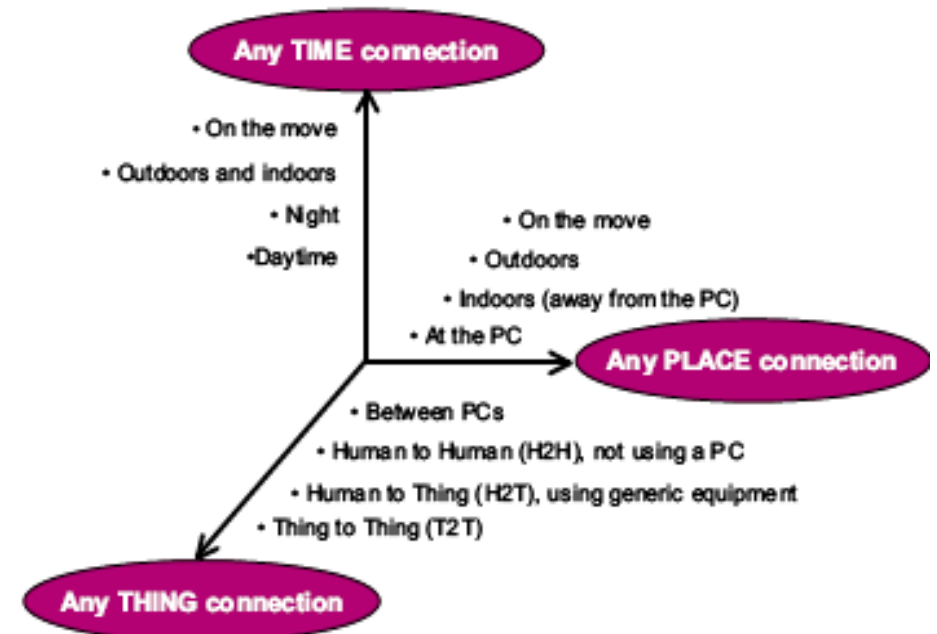


Figure 1 – A new dimension



Source: ITU adapted from Nomura Research Institute

6.31 User research

I am going to practice culture probes to get a more objective user research. The main tool will be a notebook, voice recorder(mobiles) and microsoft feedback system. The notebook is for recording information and status. The voice recorder will be analyzed in order to find out the topics. The microsoft feedback system is a tool to present your feedlings as a reference.

Set-up

These tools will be assigned to four persons which are our age for 4-5 days. Later on, the data will be collected and analyzed. Tester will recorder following information on the notebook:

- (1). Time
- (2). Gender
- (3). Type of contactor
- (4). Topics
- (5). Type of communication
- (6). Active or passive
- (7). Number on the picture (Microsoft feedback system)

Some of the coversation will be taken randomly.

More detailed information can be found in Appendix E.

Conclusion

The results from the notebook was not as satisfied as I expected. It is really hard to find the unconcious communication. Most of the communication was happened due to certain reason like homework, confirmation and etc. Most of the communication was short (ca 1-2min) not just to the family member but also to the friends. The microsoft feedback system was just used as a reference and it also didn't give much useful information. Fortunately, some of the voice pieces gives some information which I was looking for. It is quite clear to analyze the first sentence they have said and what do they care the most. Well, it is still hard to say that the analyze was 100% correct since this is a quantitative research not a qualitative research. The result shows that most of people would care about the status of their friends/families. There is no preference within the status such as emotion, motion and etc. In this case, I decied to use social status to be the parameter. The social status would also enhance their feeling of being connected. The result also shows that they need some short time communication tools. The value will be even enlarged if I take this into account.

6.41 Brainstorm session

I am going to stick to lotus blossom and mix&match since the brainstorm session in iteration II was quite efficient. I am learning how to release the intuitive innovation by a logical method. This can be a good chance.

New problem statement:

How to communicate the context of social status based on the clock model?

I defined eight factors of possible variations such as: color, pattern, shape, sensorial, function, interaction, time and others.

I choose to do the brainstorm session individually instead of think as a team. I will see which way is more efficient.

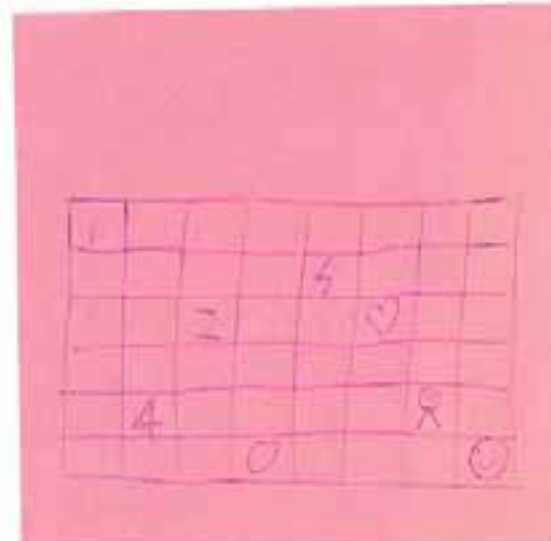
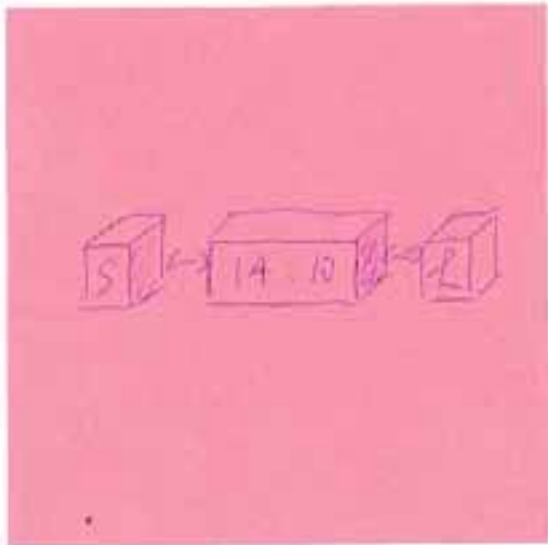
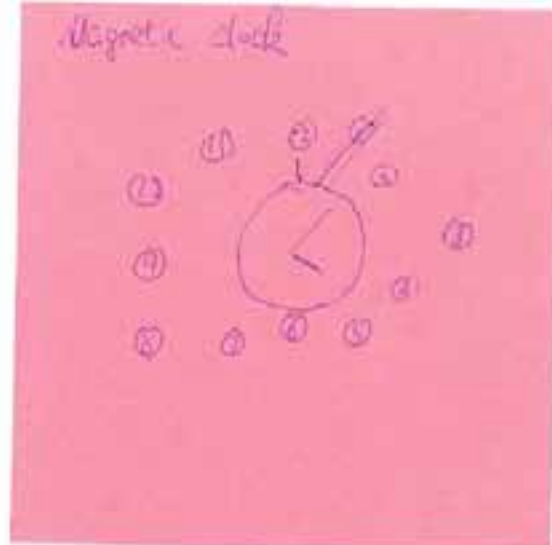
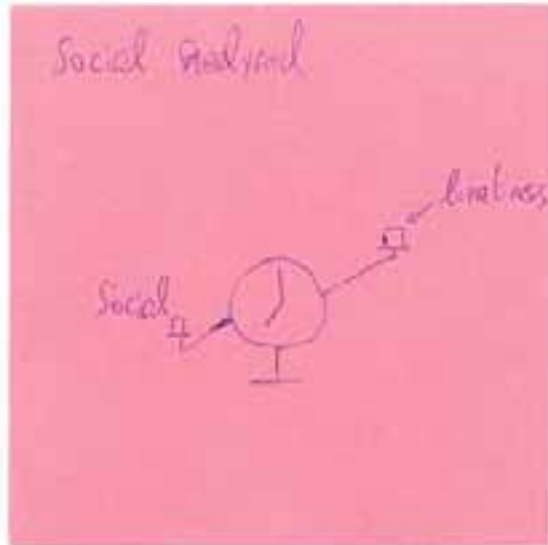
6.42 Moodboard

I made a moodboard about all kinds of clock for inspiration.





Mix & Match



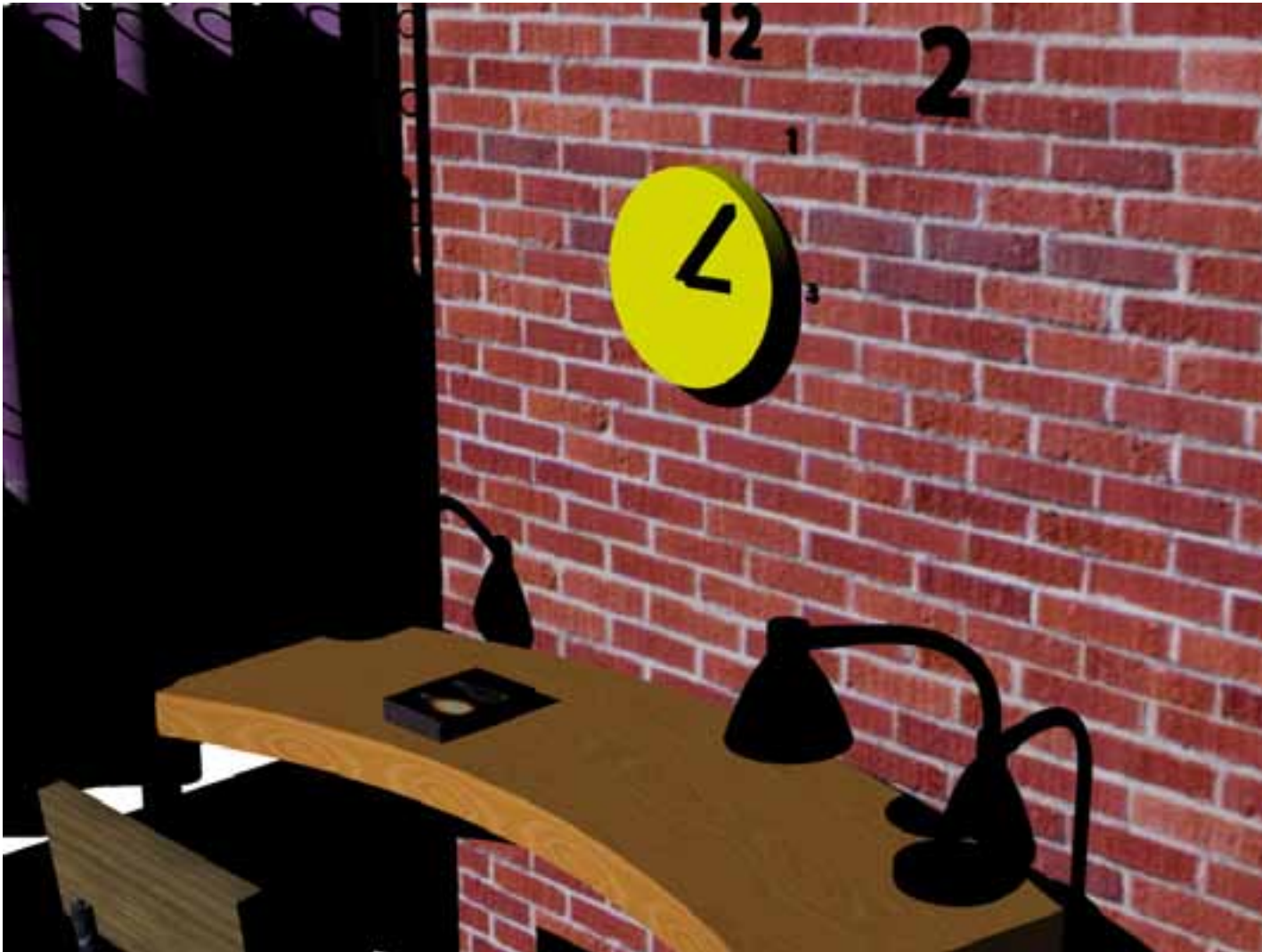
6.43 | Idea selection

The idea selection was quite obvious in this iteration. The magnetic clock was the only one which has the extra value. The abstraction is also better than other concepts. Feasibility has also been taking into account.

Idea Selection									
	Innovation	Connected feeling	Abstracted	Interaction	Feasibility	Extendable	Extra value	Total	
Steelyard	6	6	5	5	6	6	5	39	
Sandglass	7	7	7	8	6	5	5	45	
Magnetic clock	7	7	8	7	7	8	8	52	
Pattern 1	5	5	4	5	7	5	5	36	
Pattern 2	8	6	7	6	6	5	5	43	
Pattern 3	7	6	4	5	6	6	6	40	

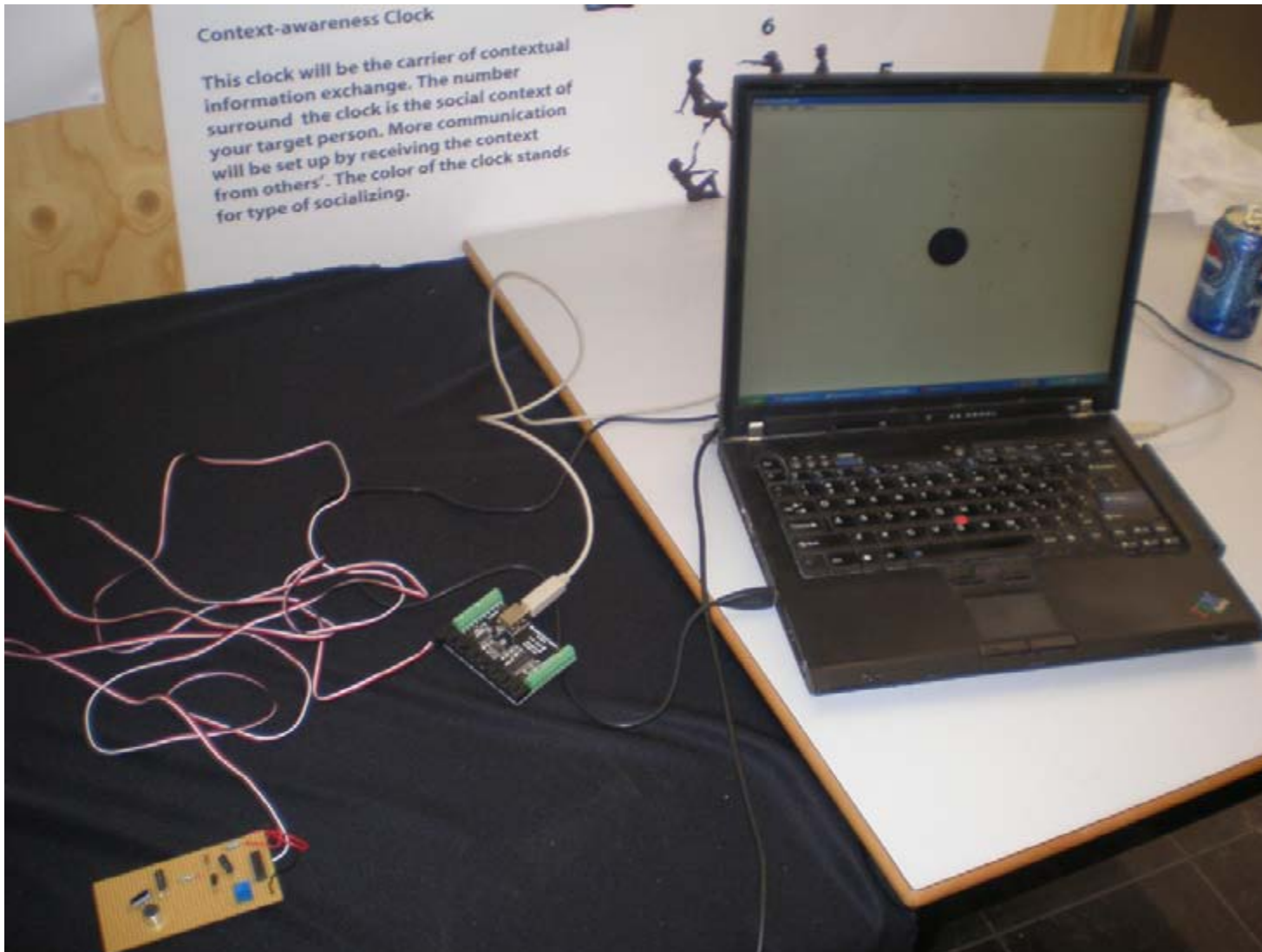
6.5 Final concept

The number around the clock will change according to the social status of other's. The size of the number and the distance to the clock are proportional. Larger the size, longer the distance stands for socialing and vice versa. The color in the middle will show dynamic situation of social environment.



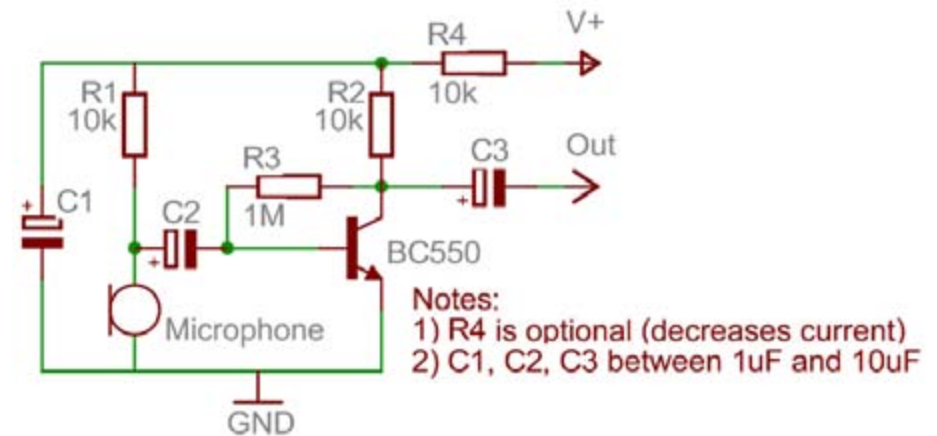
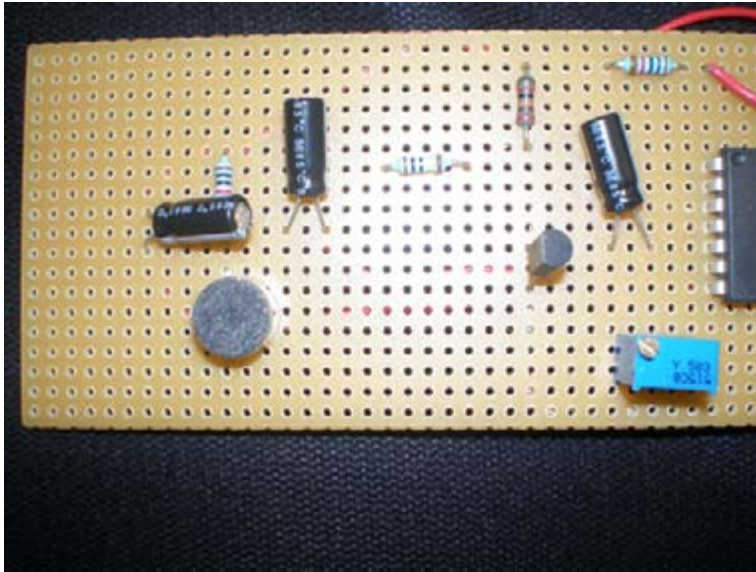
6.6 Final Prototype

The final prototype was consist by a sound sensor, phidget board and a flash program. I will introduce them seperaatly.



6.61 Sound sensor

The sound sensor consists of a microphone and an amplifier circuit. The sensor works perfectly but the value is not useful due to its short range. The sensitivity is enough only when you talk close to the microphone. I have increased the amplification but it is still unfunctional.



6.62 Flash program

The flash program is for reading the value from phidgets and calculating the coordinates of the numbers. I used random numbers in the program since the value from sound sensor is not functional.

Code can be found in Appendix F



6.7 Evaluation of Iteration III

I didn't focus too much on research during this iteration. I just simply look around to see if there is any comments compare to other product. The user research is one of my focus. It is not as objective and qualitative as I expected. But the conclusion do support my brainstorm session and the problem do exist. Maybe I should try to practice more times and apply some other tools. That's what I have learnt. The brainstorm session was quite efficient still. I get a lot of inputs from others. Sometimes it is better not to explain a lot. Just let them think randomly and release their intuitive innovation. The final concept I have chosed is what I am looking for. It fits my problem statement. But I should do more research or redesign on patterns and colors. It will make my final prototype more artistic and concrete. Prototyping is always my weak point. But I think I have practice both hardware and software. The program works fine. The only thing missing is the value of the sound sensor due to hardware limitation. I could have done a lot better if I can focus more on the pattern research.

7. Reflection of DPC13

In general, I am quite satisfied with this project. Most of the project is done only by myself. I have learnt a new design process 1/10/100 method. Evaluate each iteration afterwards really help me figuring out what should I do next. You still have chance even you have made a mistake. Research part went quite OK although it was vague from the beginning. I have facilitate three brainstorm session with teams and individuals. The outcome was a lot and I chosed one with most potential. User research can be improved by some other tools. I should further practice culture probe and gain more experiences. Prototyping should also be improved. But I am making my progress and I am happy with it. I have learnt how to deal with an inconcrete subject from my team mates and my coach. Now I am capable to complete a project on my own. I think confidence is what I benefit the most.

8. Appendix

8.1 Appendix A

User Concept Number Correct

User 1	Paths	1	
	Silhouettes	3	
	Projection	2	
	Wheels		
Preference	Projection		

User 2	Paths	2	
	Silhouettes	1	
	Projection	3	V
	Wheels		
Preference	Silhouettes		

User 3	Paths	1	V
	Silhouettes	2	
	Projection	1	V
	Wheels		
Preference	Silhouettes		

User 4	Paths	3	
	Silhouettes	3	V
	Projection	2	V
	Wheels		
Preference	Silhouettes		

User 5	Paths	2	
	Silhouettes	1	V
	Projection	3	
	Wheels		
Preference	Silhouettes		

User 6	Paths	2	
	Silhouettes	1	
	Projection	3	
	Wheels		

Preference	Silhouettes		
-------------------	--------------------	--	--

User 7	Paths	3	
	Silhouettes	1	
	Projection	2	V
	Wheels		
Preference	Projection		

User 8	Paths	2	
	Silhouettes	3	
	Projection	2	
	Wheels		
Preference	Silhouettes		

User 9	Paths	1	
	Silhouettes	3	
	Projection	2	V
	Wheels		
Preference	Silhouettes		

User 10	Paths	3	
	Silhouettes	3	
	Projection	1	V
	Wheels		
Preference	Projection		

What happens inside:

Busy and dancing people. Discolights.
Hoerenkast' because of the colours and in combination with silhouettes.
Relaxed ambience because of the yellowish colours of the building and visuals.
Blocks give an association of the busy-ness in the building. Doesn't like closed windows with visuals.

Dancing, disco feeling.
Hoerenkast' association because of the colours and the silhouettes of the people in the building..
When the blocks are coloured, people are dancing, the rest (uncoloured boxes) are people that are not dancing. More busy when everything is coloured.
Windows, because you can see very clearly what is happening inside.

Loungespace, early in the evening, calm music.
Loud music, party
Chic building, yellowish, contrast of building with abstract forms. Early in the evening
Cooler to see people, gives clearer representations and is more fun to look at.

Happens not much, happy colours that could represent different kinds of people. Purple is missing.
Dancing, busy party, because all windows are full.
Partial busy, people stand still in the building, happy colours represent the dancing people, green is a more passive colour, big and small groups of people
People behind the windows clearly represent activity and how busy it is in the disco.

Party, not a normal evening but a special party, colours look like confetti
Normal evening, seems kind of calm because of the empty windows.
Museum, a special evening, themaparty.
More direct what it has to represent, percentage of people that are displayed on the windows can represent how many people there are in the building
Paths are not that good because you can't see it if there are many people outside.

Christmas, someone important inside, red carpet association
Red light district, privacy, private area, chilling
Family visiting, decoration

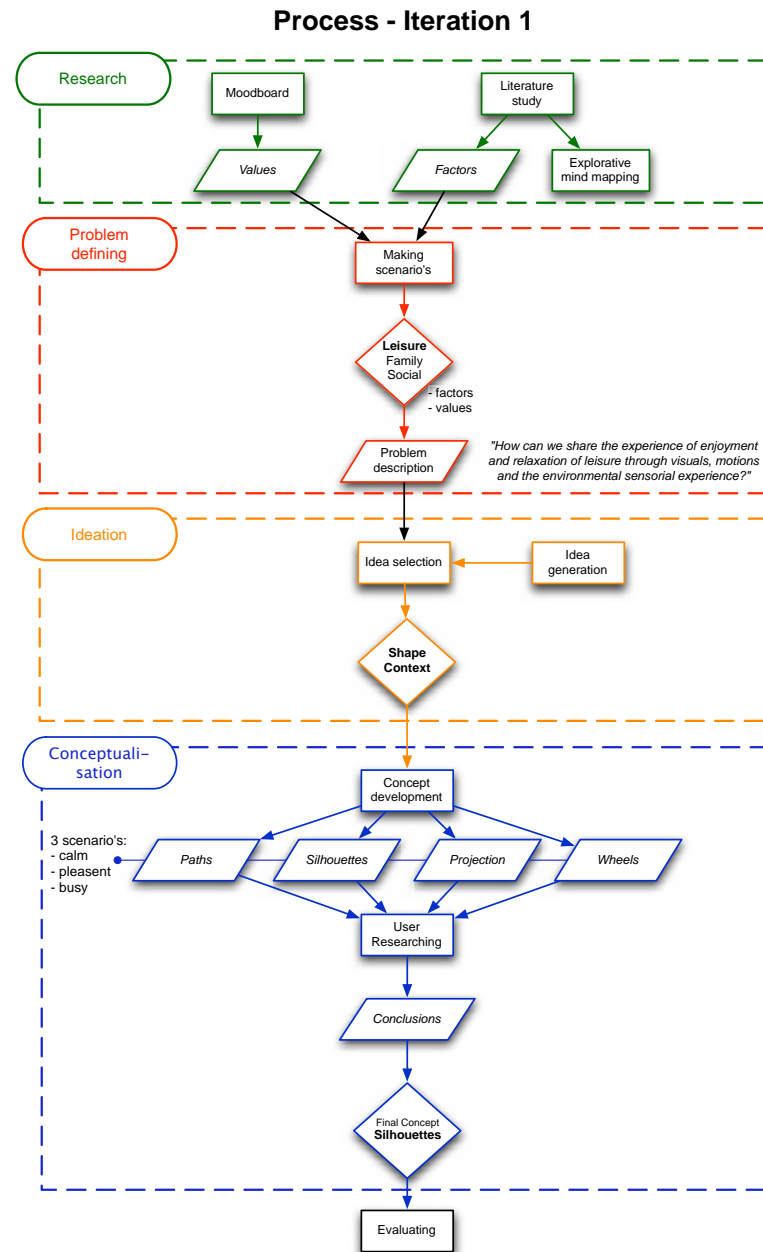
Carnaval
Gay party, intimate, romantic
Techno party, grows with amount of people that is in the building.

Mode show, chic
Laser show, normal party
Carnaval

Dance party, displays amount of people that are in the building.
Sensatoin, busy, certain music
Private party, certain group of people, art background, half-busy, blocks will fill the building

90's music, machine music feeldings
Trance music
Formal dinner, calm

8.2 Appendix B



February

- 6 2 kick off project
- 3
- 4
- 5 Search for research
- 6 Research/Moodboard
- 7 9 Present research/Creative session
- 10
- 11
- 12 Creative session/additional research
- 13 Creative session/idea selection
- 8 16 Prototyping
- 17
- 18
- 19 Prototyping/Evaluation
- 20 Presentation/Evaluation/Individual direction



8.3 Appendix C

Questionnaire 1

How often do you contact your family?
brother/sister/parents once-twice a week
grandparents/uncles/nephews once every 2-3 weeks

How often do you contact your friends?
around twice every 3 days

Why do you contact your family?
keep them updated of situation, make appointment to meet

Why do you contact your friends?
to hang out

In which way do you contact your friend?
Email/msn/phone mostly

In which way do you contact your family?
skype/phone

Do you contact them actively or passively?
active

How long do you think is the best for communication?
generally short and multiple updates

Questionnaire 2

How often do you contact your family?
parents every week, others once a month

How often do you contact your friends?
everyday

Why do you contact your family?
most of the time for special occasions like birthday

Why do you contact your friends?
to catch up and decide where and when going out again

In which way do you contact your friend?
sms/phone/msn/personally

In which way do you contact your family?
phone/personally

Do you contact them actively or passively?
both

How long do you think is the best for communication?
depends on the activity and by phone or msn 10-15 mins

Questionnaire 3

How often do you contact your family?
once or twice a week

How often do you contact your friends?
everyday

Why do you contact your family?
out of love

Why do you contact your friends?
interest and want to do fun things

In which way do you contact your friend?
msn/sms/real life/physical

In which way do you contact your family?
physical/phone

Do you contact them actively or passively?
active

How long do you think is the best for communication?
depends on tools, goal and etc

Questionnaire 4

How often do you contact your family?
parents every day, every two weeks

How often do you contact your friends?
2-3 times a week

Why do you contact your family?
to keep in touch, congratulate, talk and make appointments

Why do you contact your friends?
to make appointments, talk about what have done etc

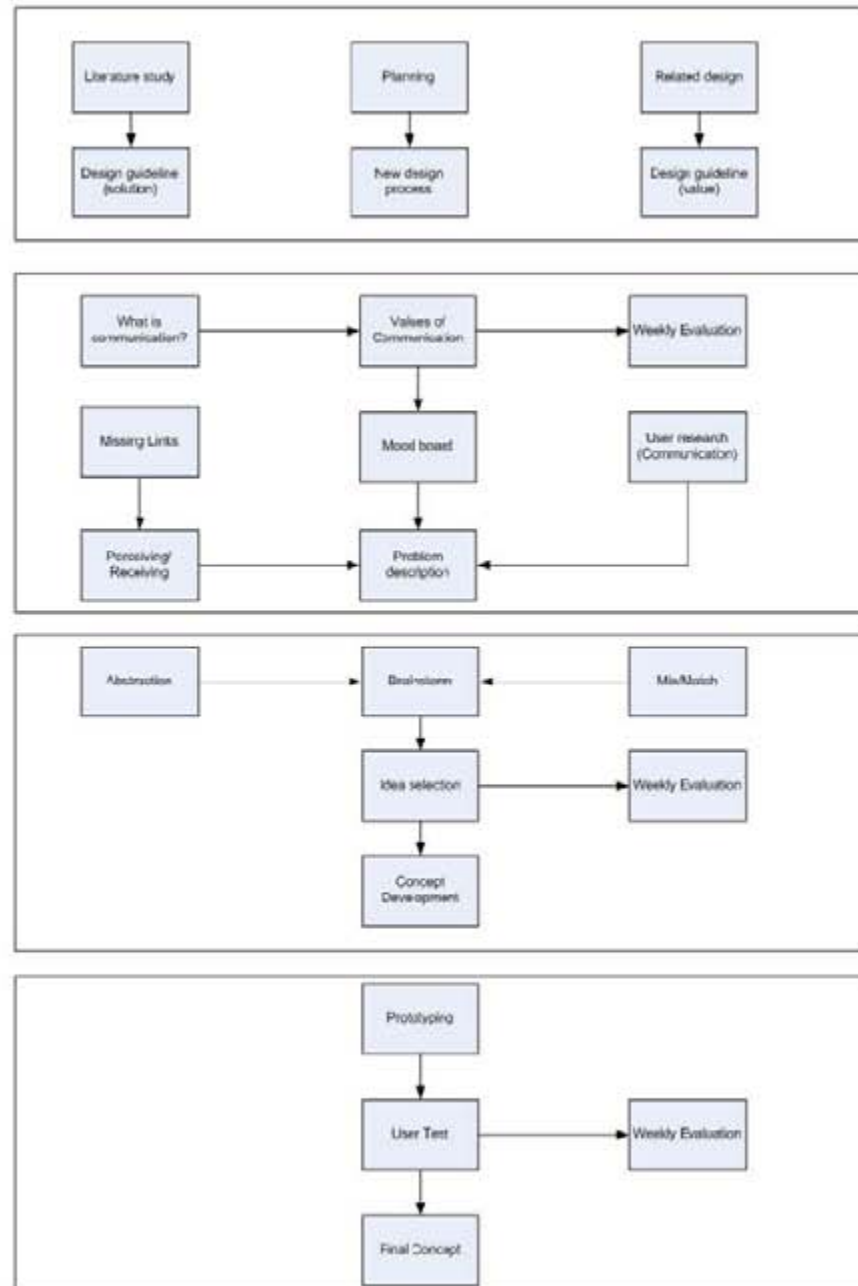
In which way do you contact your friend?
sms/mail

In which way do you contact your family?
phone

Do you contact them actively or passively?
active

How long do you think is the best for communication?
phone call 10-15 mins

8.4 Appendix D



2th			5th			6th			9th			12th			13th		
Guidlines			Search for Research			PCM			Additional research			Brainstorm session			Brainstorm session II		
Research			Research			Present research			Design brainstorm session								
Planning			Moodboard			reflection											
16th			19th			20th			23th			26th			27th		
Idea selection			Idea selection			PCM			Prototyping			Prototyping			Present concept		
			Scientific research			Present concept											
						reflection											

8.5 Appendix E



8.6 Appendix F

```
var i = 0;
var a = 0;
h1._visible = false;
h2._visible = false;
h3._visible = false;
h4._visible = false;
h5._visible = false;
h6._visible = false;
h7._visible = false;
h8._visible = false;
h9._visible = false;
h10._visible = false;
h11._visible = false;
h12._visible = false;

countdown = function(){
    i++;
    trace(i);

    var colorful = new Color("_root.cir");
    colorful.setRGB(random(255),random(255),random(255));

    a = random(100);

    writenumber();

    if (i==12){
        i = 0;
    }
}
```

```
function writenumber(){
    var emphatic: TextFormat = new TextFormat();
    emphatic.bold = true;
    emphatic.size = a/4; //size
    emphatic.font = "Arial";

    if (i==1){
        h12._visible = true;
        h12.setTextFormat(emphatic);

        //h12._x += a* Math.cos(90);
        h12._y -= a* Math.sin(90);

        h1._visible = false;
        h2._visible = false;
        h3._visible = false;
        h4._visible = false;
        h5._visible = false;
        h6._visible = false;
        h7._visible = false;
        h8._visible = false;
        h9._visible = false;
        h10._visible = false;
        h11._visible = false;
    }
}
```

```

h12._x = 284;
    h12._y = 7;
    h1._x = 368;
    h1._y = 29.5;
    h2._x = 429.5;
    h2._y = 91;
    h3._x = 452;
    h3._y = 175;
    h4._x = 429.5;
    h4._y = 259;
    h5._x = 368;
    h5._y = 320.5;
    h6._x = 284;
    h6._y = 343;
    h11._x = 200;
    h11._y = 29.5;
    h10._x = 138.5;
    h10._y = 91;
    h9._x = 116;
    h9._y = 175;
    h8._x = 138.5;
    h8._y = 259;
    h7._x = 200;
    h7._y = 320.5;
}

if (i==2){
    h1._visible = true;
    h1.setTextFormat(emphatic);
    h1._x += a* Math.cos(60);
    h1._y -= a* Math.sin(60);
}

```

```

if (i==3){
    h2._visible = true;
    h2.setTextFormat(emphatic);
    h2._x += a* Math.cos(30);
    h2._y -= a* Math.sin(30);
}

if (i==4){
    h3._visible = true;
    h3.setTextFormat(emphatic);
    h3._x += a* Math.cos(0);
    //h3._y += a/ Math.sin(0);
}

if (i==5){
    h4._visible = true;
    h4.setTextFormat(emphatic);
    h4._x += a* Math.cos(-30);
    h4._y += a* Math.sin(-30);
}

if (i==6){
    h5._visible = true;
    h5.setTextFormat(emphatic);
    h5._x += a* Math.cos(-60);
    h5._y += a* Math.sin(-60);
}

```

```

if (i==7){
    h6._visible = true;
    h6.setTextFormat(emphatic);
    //h6._x += a* Math.cos(-30);
    h6._y += a* Math.sin(-30);
}

if (i==8){
    h7._visible = true;
    h7.setTextFormat(emphatic);
    h7._x -= a* Math.cos(-120);
    h7._y += a* Math.sin(-120);
}

if (i==9){
    h8._visible = true;
    h8.setTextFormat(emphatic);
    h8._x -= a* Math.cos(-150);
    h8._y += a* Math.sin(-150);
}

if (i==10){
    h9._visible = true;
    h9.setTextFormat(emphatic);
    h9._x += a* Math.cos(180);
    //h9._y += a* Math.sin(180);
}
}

```

```

if (i==10){
    h9._visible = true;
    h9.setTextFormat(emphatic);
    h9._x += a* Math.cos(180);
    //h9._y += a* Math.sin(180);
}

if (i==11){
    h10._visible = true;
    h10.setTextFormat(emphatic);
    h10._x -= a* Math.cos(150);
    h10._y -= a* Math.sin(150);
}

if (i==12){
    h11._visible = true;
    h11.setTextFormat(emphatic);
    h11._x -= a* Math.cos(120);
    h11._y -= a* Math.sin(120);
}

}

}

countdownInterval = setInterval(countdown,200); //300000

```

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