

Design for Autism

COLLABORATION TOOL

**“If you’ve met
one person
with autism,
you’ve met
one person
with autism.”**

"Know Me"- Collaboration tool for surroundings support individuals with autism | Yafei Ma | Interaction design



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Executive summary

What is this project about ?

This project is about exploring autism system and how can we improve the collaboration between surroundings (parents, caregivers, teachers) support individuals with autism.

Aim

The overarching goal of this project is to improve the lives of individuals with autism and people around them.

Context

Individuals with autism often have trouble communicating with others and caring for themselves. Therefore, they depend on the support of the people around them

One big challenge for the parents, teachers and caregivers is collaboration and communication. Carers often keep written notes on the individual's condition, so that they can share information and collaborate amongst themselves. However, this method is not always efficient. Information may get lost, which prevents them from helping the autistic individual improve his or her life.

Findings

- 1.Important information like health condition, food intake, bathroom regularity can't be documented in the notebook due to the information security.
- 2.There is a lack of information analysis for recording.
- 3.Valuable information always gets lost.
- 4.There is no direct communication channel between stakeholders.
- 5.Methods and techniques developed by caregiver, teacher and parents fail to get captured and shared.
- 6.The trajectory of a person's progress and achievements is undocumented.

Design process

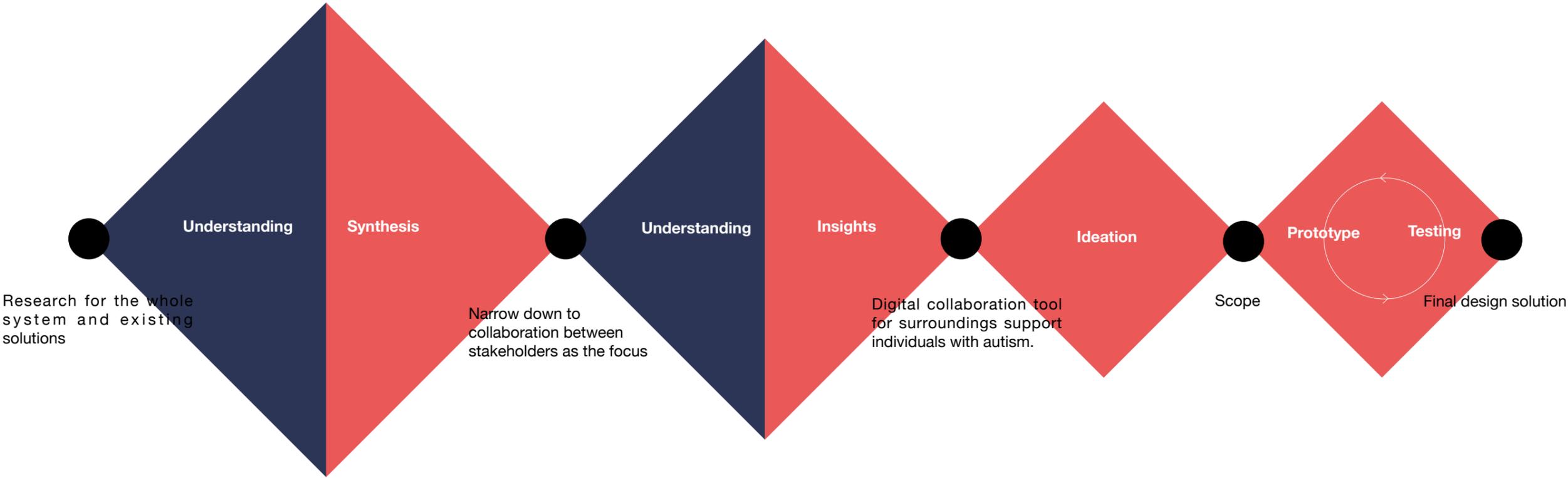
The project starts from a very broad topic: autism. The service design approach was used during the research phase. I explored the autism system in Norway to get an overview of the current situation. Then I narrowed the project down to the more specific area of collaboration between stakeholders. I engaged with parents, caregivers, and other stakeholders when creating discussable artefacts in order to advance the design process.

Design proposal

This resulted in "Know Me", a digital platform for stakeholders to collaborate together by recording and sharing the daily situations of the individuals with autism. They can use this tool to analyze the individual's condition and develop methods to enhance their standard of living.

Know Me makes the collaboration more efficient and meaningful. It gives stakeholders a way to better understand the person with autism which would help stakeholders organize and plan the person's life more effectively.

Design process overview



1. Introduction

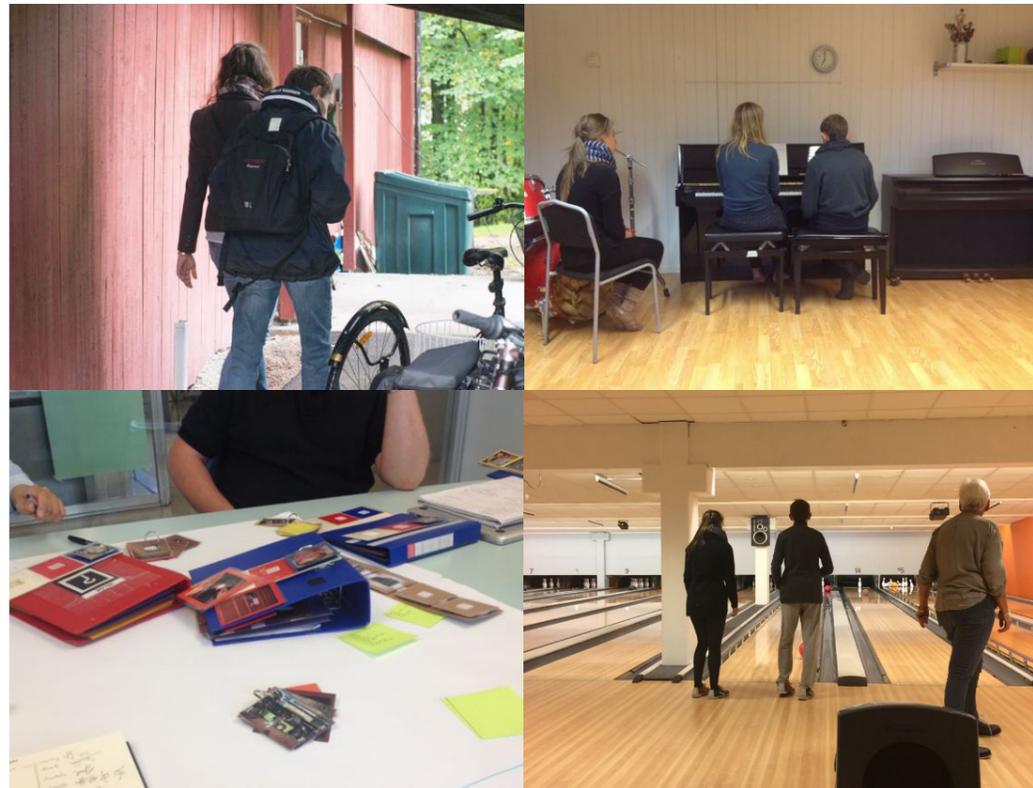
This chapter will present the aim and context of this diploma project and why I choose to work with it.



Autism for diploma

The choice of this topic was based on a project within the System Oriented Design Course of Fall 2015. The project focused on autism, especially in our case Adrian, a 24-years-old young man, who has been diagnosed with epilepsy and infantile autism. We gathered a lot of information about autism and Adrian's situation, and provided an outcome that beneficial for him.

Throughout the project with Adrian, we took lots of time on the research of him, identifying his possibilities by interviews and observations. It is not easy to understand a person who is non-verbal and can't express himself. We took one week to participate in his everyday life to gather a better understanding about how autism affects this young man's life.



Aim

Throughout the project with Adrian, we found lots of potential areas to improve his life, for example, the communication-how might we help his communication skills? How might we help him to express his feeling? Meanwhile, I also find that it is important to look into the whole system of autism in Norway. There are many actors involved in the life of an autistic person, like family, school, care home, municipality, Nav, and habilitation center. And each of these actors has an impact on the individual. Therefore, it would be an effective approach to improve the lives of autistic people by focusing on the surroundings rather than the individual him- or herself.

For my diploma, I want to look into the whole system surrounding autism to try and understand the challenges faced by the actors involved. My objective is to try to find a solution to these challenges and, ultimately, to improve the system and benefit individuals with autism. This means I will start with a broad topic to gather enough knowledge of the system, and then narrow down my topic to one specific area, before proposing a solution that will benefit both the autistic individuals and the people around them.

Motivations

Throughout my time working with Adrian, I have seen that how challenged and complicated the system of autism is. Autistic people often have communication disabilities. Some are non-verbal and can't express themselves. As a designer, it is challenging to work with a user that cannot tell you their needs themselves and, therefore, you must rely on the answers you get from the people around them. It is also very interesting. We are tasked with designing different tools to understand this person, and this task intrigues me.

As an interaction and service designer, I want to explore how appropriate design could help in healthcare area, especially for people with special needs. I believe appropriate design can make a difference to their lives.

Implication for the project

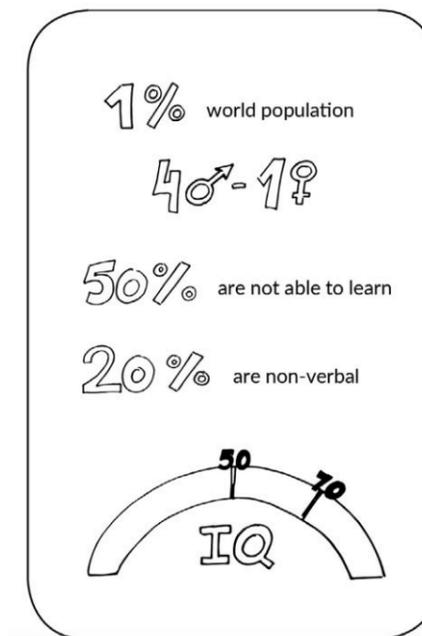
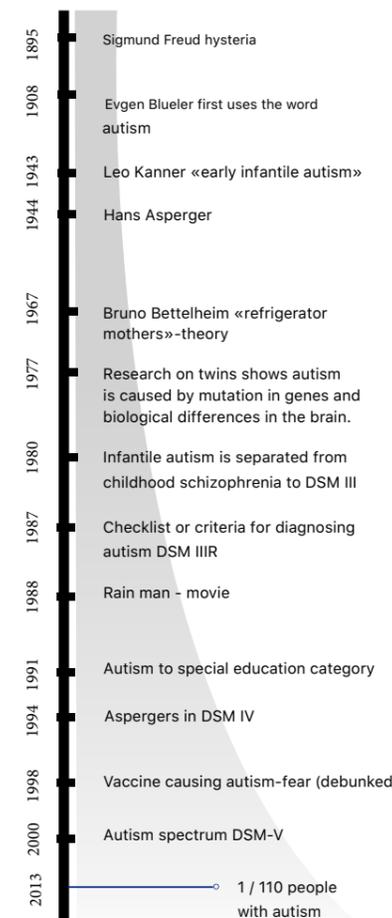
The project with Adrian will be the starting point for my diploma project and will contribute substantially to my current design process.

2. Background

This chapter will give you a general understanding of autism by explaining the history, causes and symptoms to understand the context of this project.

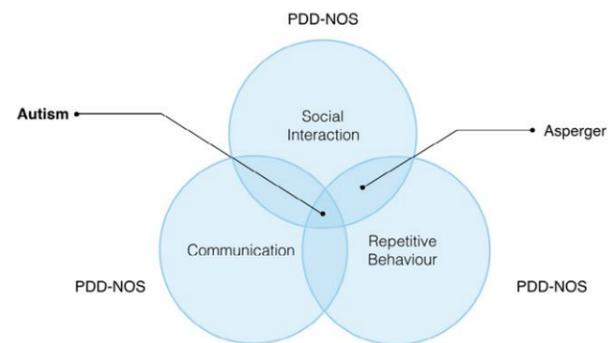
Global view on Autism Spectrum Disorder

This section aims to highlight the history and facts about ASD to understand the context.



Doctors have come a long way since 1908, when the word autism was first used. This illustration shows the history of autism spectrum disorder, and the facts about autism.

Autism is a complicated disorder to understand and the research on it is still going on. The increasing percentage of people with autism can be explained by the evolution of the autism spectrum.



Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a general term of a group of complex disorders of brain development, which includes autistic disorder, Asperger's syndrome, pervasive developmental disorder not otherwise specified (PDD-NOS). These disorders are characterized, in varying degrees, by difficulties in social interaction, verbal and nonverbal communication and repetitive behaviors.

Asperger's syndrome

This is on the milder end of autism spectrum. A person with Asperger's may be very intelligent and able to handle her daily life. She/he may be really focused on topics that interest her/him and lacks delays in cognitive development and language. But she/he has a much harder time socially.

Pervasive developmental disorder, not otherwise specified (PDD-NOS).

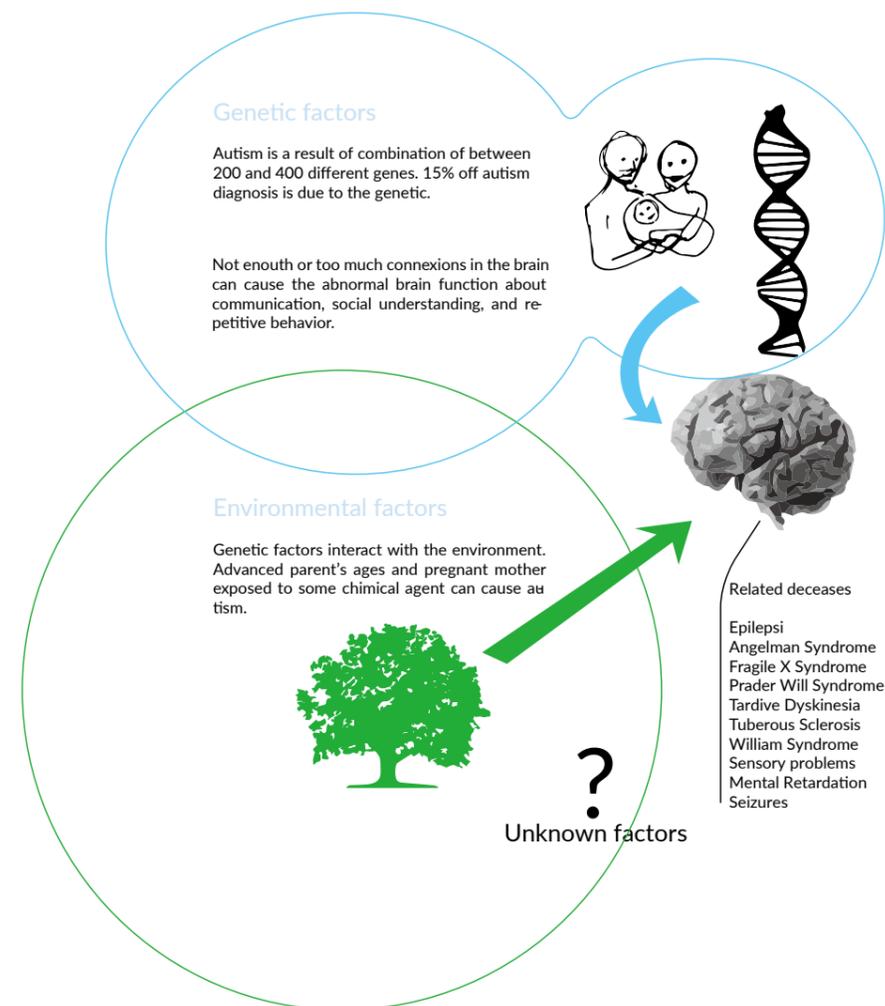
This is diagnosed when the full set of criteria for autism or Asperger syndrome were not met.

Autistic disorder

This order term is further along the autism spectrum than Asperger's and PDD-NOS. It includes the same types of symptoms, but at a more intense level.

Implications for the project

In this diploma, I mainly focus on Autistic disorder which also refers as Autism. Since it covers all the symptoms which means there are more challenges but will have more opportunities.



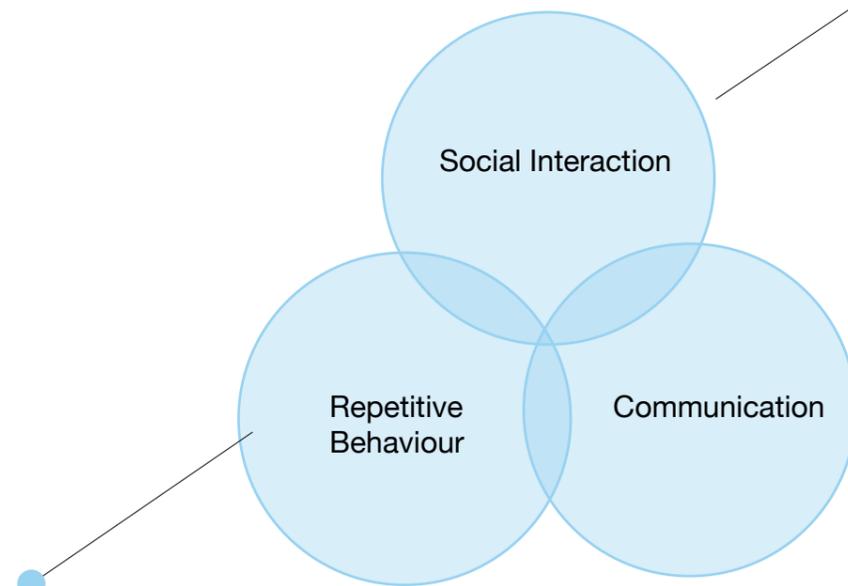
The cause of ASD

Experts are still uncertain about all the causes of autism. In all likelihood, there are multiple causes – rather than just one. It appears to be that a number of different circumstances – including environmental, biologic, and genetic factors.

What is Autism ?

" If you know one people with autism, you know one people with autism."

This section aims to highlight the three different characteristics of autism to have a better understanding what is autism by giving three different examples of how it could feel to have autism.



Peter's story

In my second year, I learned a few words. Like normal words, things around me. But after I turned two I stopped learning more words and quickly lost the words I had learned before. I was mostly occupied with my matchbox cars. Lining them up. One by one, the same pattern over and over again.

It still is like this. Not with my matchbox cars anymore, but I need a system to work on. To make my perception of the world more aligned. Something to stay focused on. In my care home there are assistants trying to interpret what I want. I get so frustrated when I can't get through what I mean.

Sara's story

I find it hard to understand how the same word can have different meanings just because of how they are pronounced. First time I learned about this was in third grade when my school teacher told me about it after I got into a fight with a boy in my class. He told me that I could borrow his eraser, but then he didn't want to give it to me. I got really confused and rather sad really. After this my teacher told me about irony and sarcasm. Rather abstract concepts at the time, but he told me that people can say something and actually mean the opposite. There was a lot of situations like this throughout my childhood.

I still think about him, and all the others. I try to remember this when I'm communicating with others. I feel that I really need to concentrate really hard to listen to how they pronounce words and use different intonations. Throughout the years I have learned many different ways how words change meaning with different intonation.

Will 's story

My parents have told me that during my first years after being born they were really concerned about my development. I was not very interested in their initiatives on playing usual games for children. They have told me that I didn't develop smile and wasn't interested in eye contact with them. And I didn't say a word until I was two.

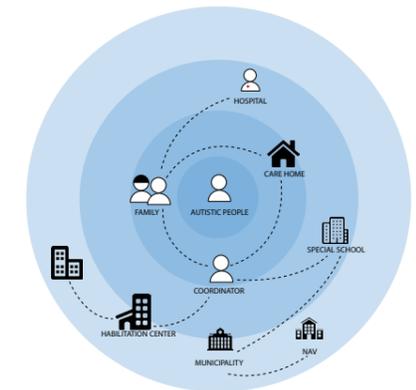
I'm still struggling with sustained eye contact. I learned that it can increase the trust between me and the ones I'm communicating with. But it is stressing me out. I myself don't see the point exactly, but I read stuff like 90% of all communication is nonverbal. So while I'm in a conversation with others this is literally in the back of my head all the time. Isn't my communication sufficient? How do you cope with that?

3. Research

This section will present the research framework, how I went to explore the autism system and narrowed down to collaboration between stakeholders, and my main findings from this process.

Approach

The goal of this diploma is to improve the lives of individuals with autism and people around them. This is a broad objective. So, in some ways, the research will be foundational. The service design approach will be used in this phase, which means I will start with the broad topic to understand as much as possible about the system surrounding autism in Norway. Then I will narrow down to a specific area of investigation. The findings of the research will have two parts; the first part will be from the broad investigation, and the second part will be from the specific area of investigation.



Actors

I started by exploring the main actors in the system. There are nine main actors within the autism system in Norway.

Competency center- a regional center for autism providing specialized services in terms of diagnosis and treatment for individuals with ASD, and giving supervision and support to parents, caregivers

NAV - offers financial support and responsible for providing main stream solutions for people with autism.

Rehabilitation center - assists a person recovering from a serious injury, illness or surgery to regain strength, or relearn skills.

Municipality-offers a variety of services for children with special needs.

Hospital-provides consultancy, diagnosis, and treatments.

Special school-offers special educational guidance and support.

Care home (Avalstning)-provides lodging, meal services and assistance with daily living activities to give relief to the families of individuals with neurodevelopmental disorders.

Activity center (Dagtibud) - provides various activities for people with neurodevelopmental disorders.

Interview



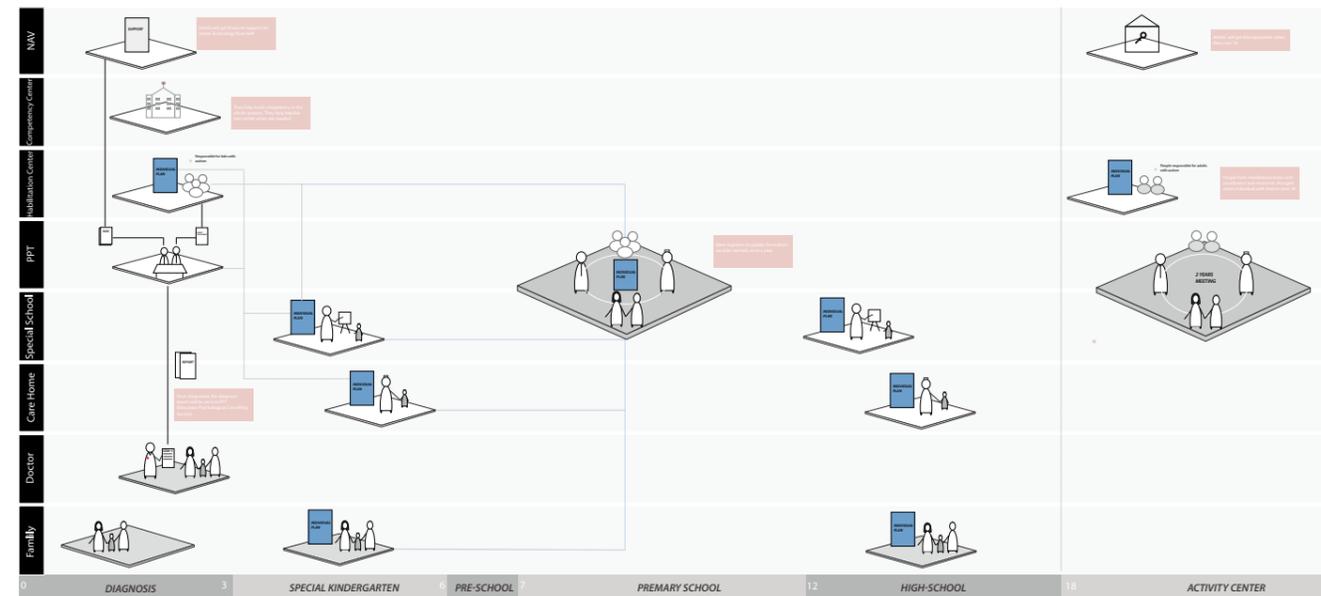
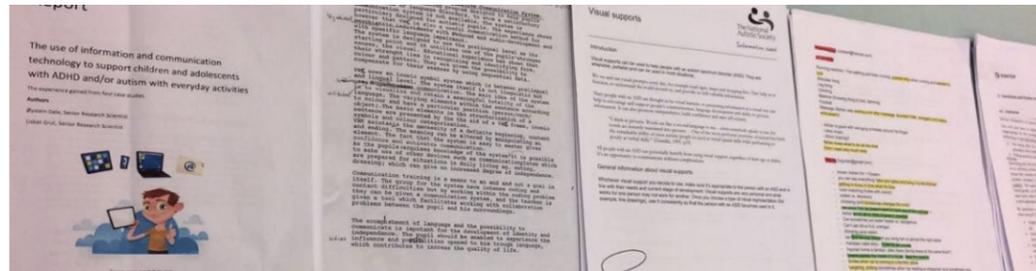
I had several interviews with the main stakeholders within the system
The goal of the interviews it to develop an understand of:

- The situation of autism system in Norway today
- The roles and responsibilities of different stakeholders

These are four main stakeholders I had met, by talking to these different stakeholders in different positions I hoped to cover the situation today.

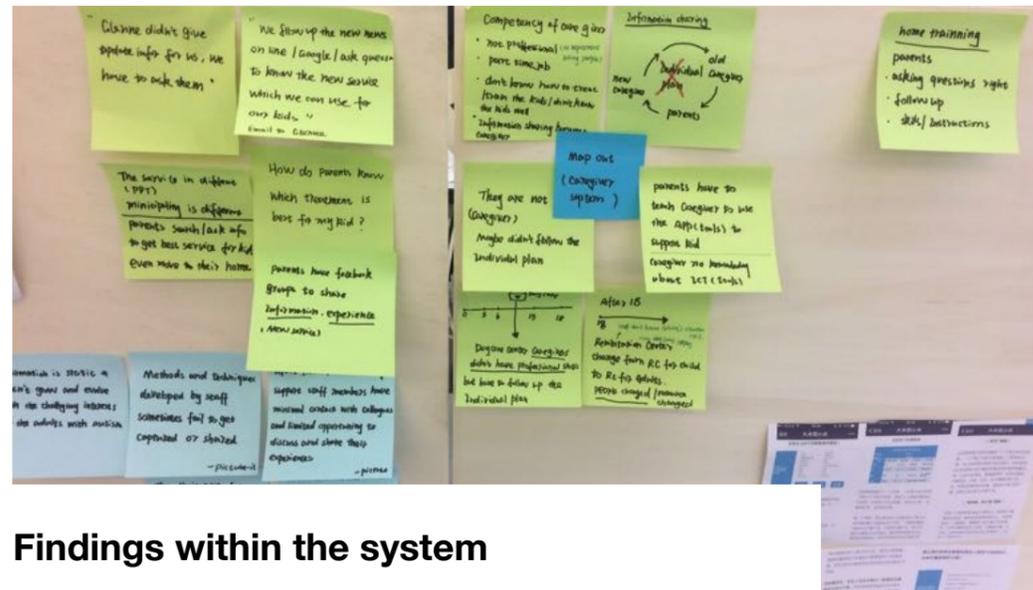
Desktop

Secondary research was another important source to gather insight on the topic. I read four different articles to learn about the broader context of autism. As this diploma project is an interaction and service design project, I want my design proposal to be digital. I explored recent news and digital innovations in this area for inspiration. This helped me to ascertain the opportunity areas for the next steps.



System map

A system map was made during the research to illustrate the overview of the system, how the whole system works and the relations between different stakeholders.



Findings within the system

After analyzing the research, I mapped the findings. I divided the findings into four categories: **information, resources, communication, and competency.**

Information

Only few actors provide information related new services / solutions for autism

"We follow up the new news online, Google, ask questions or email to Glenne to ask if there are any new services or technology which we may can use for my kid." -Parent

Parents don't know where to find information about suitable technologies related to autism

"We create Facebook group to share information and experiences for the new treatments or technologies." -Parent

"How can I know which treatment is best for my kid?" -Parent

Resources

Services/resources are not equally distributed in different areas in Norway

"The services in different municipalities are different, some parents search in different municipalities to get best services for their kid."

- **Manager of Glenne competency services**

"Some families move to another municipality if they have better services."

- **Parent**

Resources change and stop when individual with autism is over 18

"Individual with autism will change from kid group of habilitation centre to adult group when they are 18." - **Manager of Glenne competency services**

"The people and resources changed, new coordinator may not know the situation of my kid well even they have all the document of him."

- **Parent**

No information, training, assistance and support for mainstream solutions

"All the families used technology on a daily basis, e.g. smartphones, tablets and PCs, but without training, assistance and support they were unable to reap the full benefits of the support that technology could offer in their daily lives." - **Report <The use of information and communication technology to support children and adolescents with ADHD and/or autism with everyday activities>**

"We didn't get lots of information and help from the municipality related the mainstream solutions." - **Parent**

Collaboration

The communication between parents, caregivers and teachers is a big challenge.

“Parents are familiar with using phones and Google calendar but school have student web system, they don’t interact with each other.”

-**Manager of Glenne competency services**

“Each kid has a book, which they take it to the school , the teacher write it as a report, then parents can check what happening at school when kids come back home.” - **Manager of care home**

Different organisations of different levels have different systems

“We have different system with school and activity center, it makes things difficult when we want to exchange or update the information related to the people we support.” - **Manager of care home**

Competency

Low level of competency of Caregiver

“Lots of caregivers don't have any formal education about how to treat autism or different mental health problems in Norway.”

- **Manager of Glenne competency services**

“We don't have enough people with special education and there are no requirements for hiring people, most of people are part-time.”

- **Manager of care home**

Opportunity areas

All of this research and insight gained provided me with the basis for a thorough analysis in order to detect problems and opportunity areas.

I identified the following four opportunity areas that I consider to be important and to have a lot of potential for improvement.

- Make the **information** related to the autism accessible for all stakeholders, especially the parents
- Make the **resources** more visible, accessible and distributed equally
- Improve the **collaboration** situation between stakeholders
- Improve the **competency** of caregivers to better support individuals with autism

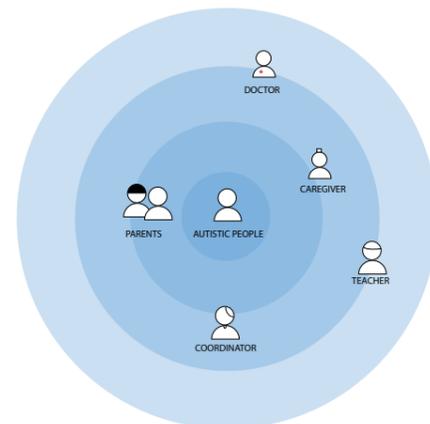
Narrow down

The project was narrowed down to the collaboration between stakeholders during the interview. During the research, all the stakeholders, parents, caregivers, and coordinators mentioned that collaboration is the biggest challenge they are facing currently.

The quote on the right side is from a father of a kid with autism. His comments allowed me to understand that there is a need for an improvement in collaboration between stakeholders.

So from here, I decided to focus on the collaboration, which means I will open up again to explore what collaboration is and how it works.

"With some of parents, we even get together to find a way by ourselves to improve the collaboration between stakeholders. It seems most of parents are not satisfied with the collaboration now. As parents, we should do something, because it is so important for my kid."



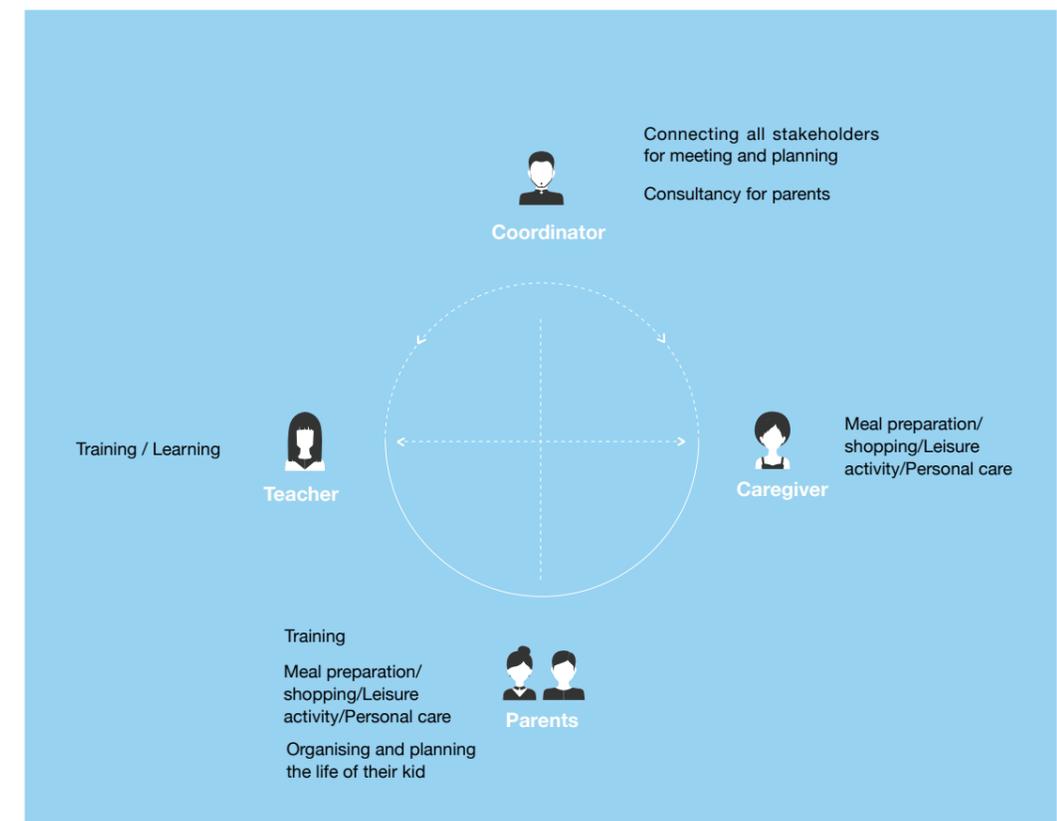
Why collaboration

Since autism is a lifelong and complex neurodevelopmental condition that affects people in different ways, communication and self-care are the main challenges for people with autism. They may live in care home, and often need high level of support with most aspects in their daily life from people around them (parents, teachers, caregivers).

So parents, teachers, caregivers work together to enhance the lives of people with autism. To a great extent, the quality of the lives of individuals with autism is decided by how the stakeholders support them and how stakeholders collaborate with each other.

Stakeholders

There are four main stakeholders that work closely with autistic people. Each stakeholder has a different role. The illustration shows the responsibilities of these stakeholders.





Frode
Father of kid
with autism



Marton
Father of kid
with Down
Syndrome



Katrine
Caregiver
Engeløkka
Dagtilbud



Nachata
Caregiver
Manager
Bondi Avlastning



Per Christian
Coordinator
Asker

Interview

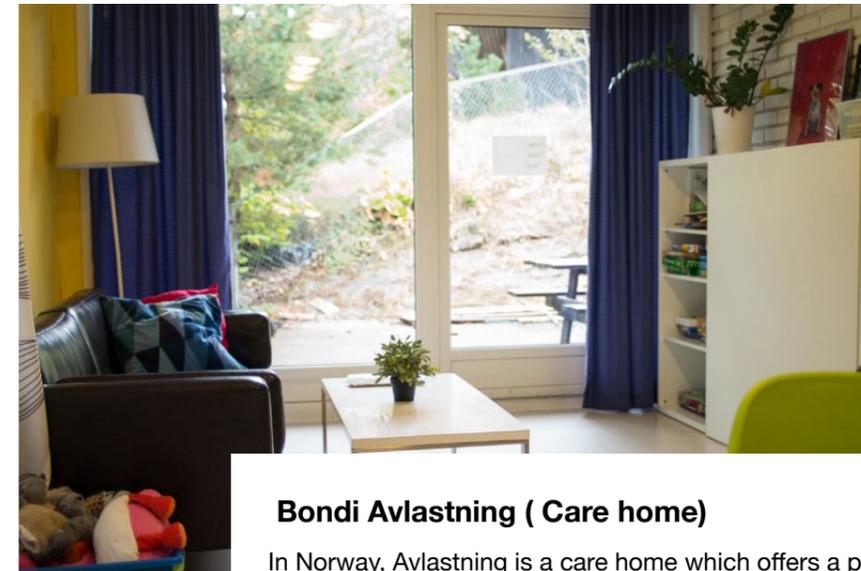
In order to get a deeper understanding of what the current collaboration situation is and why it is the biggest challenge, I met with several core stakeholders.



Engeløkka, Dagtilbud(Activity Center)

Engeløkka is the activity center for people with neurodevelopmental disorders in Asker. In Norway, If people with neurodevelopmental disorders are over 18 and stop going to school, they can apply to the Dagtilbud for day care. They will stay there for various activities during the day time from 9 am to 4 pm every day.

In Engeløkka, there are people who have autism, ADHD, Down's Syndrome, Intellectual Developmental Disorder, among other conditions. Caregivers in Engeløkka will provide assistance with meal preparation, shopping, managing money, leisure activities and personal care. Caregivers plan different activities for the whole day. Each caregiver will be responsible for one person everyday.



Bondi Avlastning (Care home)

In Norway, Avlastning is a care home which offers a place for families and individuals who struggle under the burden of caring for the autistic individual. The purpose of the Avlastning is to prevent overloading of the parents, and give parents from being overburdened and to give them necessary leisure time. Normally, individuals with neurodevelopmental disorders who apply for Avlastning live one week at the care home and one week with their parents.

I visited Avlastning for two days last semester to observe Adrian's everyday life. I had another trip this time planned to get an understanding of how Avlastning works and how they collaborate with schools and activity centers.

Avlastning houses both children and adults with neurodevelopmental disorders. Individuals normally live in the care home every other week. Residents under 18 go to school during the daytime and come back in the afternoon. Residents over 18, who are no longer in school, will go to the activity centre during the day and return in the afternoon.

Normally, there will be three different caregivers to support one individual throughout a given day. There is a different caregiver responsible for the morning, the afternoon, and the evening.



Katrine, Caregiver, Engløkka(Activity Center), Asker

Katrine is a caregiver in Engløkka, I had an interview with her to get to know how the caregiver works with autistic people, and why collaboration is a challenge for them.

Notebook

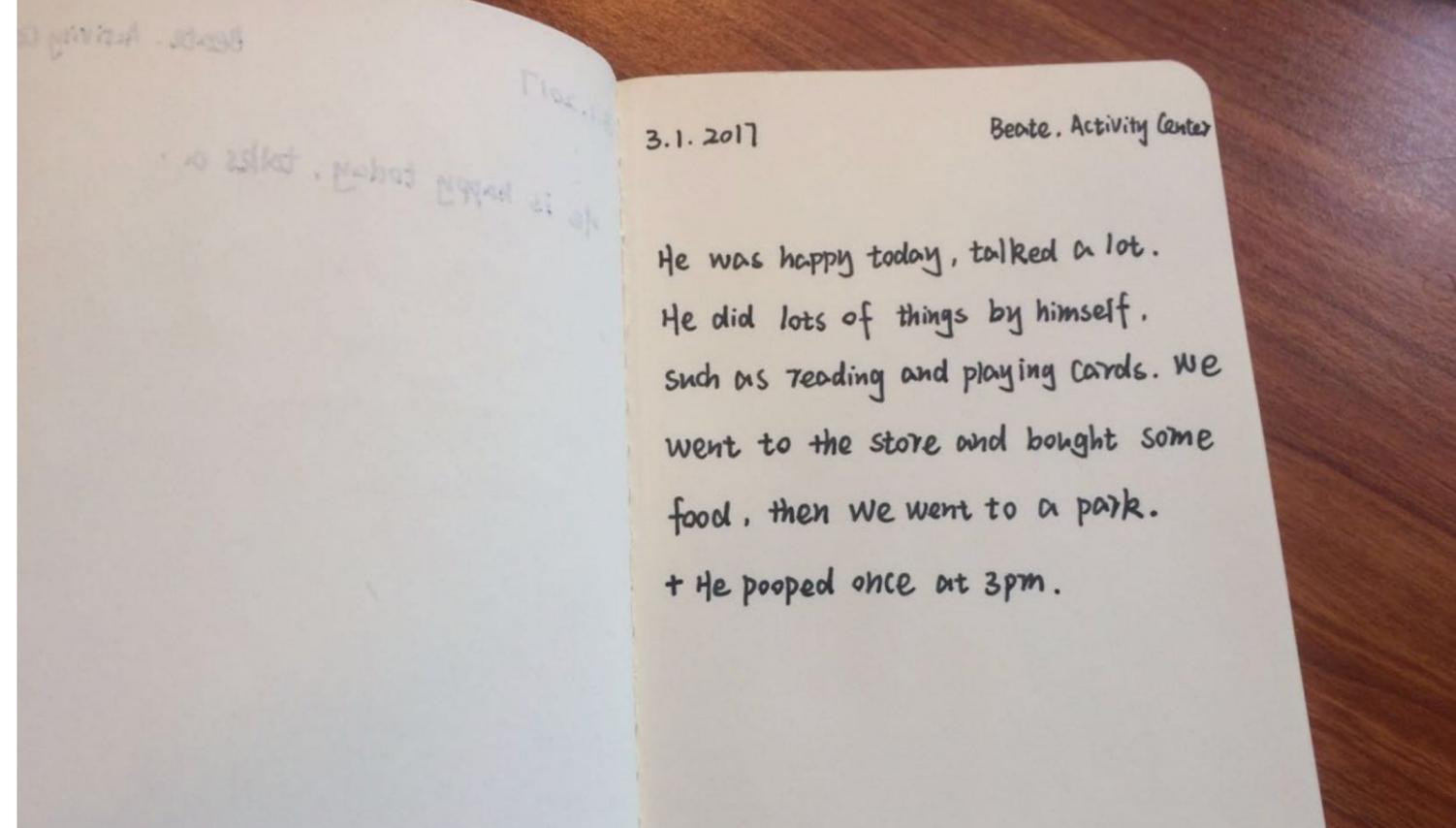
She showed me a notebook, which was a notebook that almost each individual with autism has in Norway.

All the stakeholders use this notebook to follow up the daily situation of the individual. The autistic individual will carry the notebook with them throughout the day. Teachers, parents, and caregivers will take note what the individual's activities during the day so that information can be communicated with other stakeholders.

For the notebook, they can only write down very general information. Health, toilet, and food information cannot be written in the notebook because it is not secure. The notebook can easily be misplaced, and it would be inappropriate for an unintended third party to have access to the such personal information.

But for all stakeholders who take care of their daily, it is very important to know the health, toilet and food info of the individual, particularly because the autistic individual cannot be communicated for him- or herself. For example, the caregiver at the activity center needs to know if the individual has epilepsy before he or she comes to the centre. The autistic individual may be very tired if they have had seizures before. Being aware of this information would help the caregiver understand the individual's situation, and plan their day with full knowledge.

" We can't write the health , food and toilet infomation in the notebook which is very important for us to know, because it is not secure. "



This is an example of the notebook. Due to sensitivity of the contents, a real notebook cannot be displayed.

Stakeholders usually make very basic note of what the individual has done during the day. Sometimes stakeholders will take pictures to demonstrate the individual's activity and include a printed copy inside the notebook. Parents are always very happy to see this, and are always very interested in the details of their child's activities.

Katrine shared that when caregivers have meeting with behaviour analysts and parents to discuss the child, they always want to know details of the child's recent behaviour. The caregiver generally does not remember all of the necessary details to answer the related questions fully because this information can't be documented in the notebook. But this detailed information is very useful for behaviour analyst to make adjustments for the autistic individual.

Per Kristian, Coordinator, Asker Municipality

I met Per Kristian, who works as coordinator for people with neurodevelopmental disorders in Asker Municipality. He follows up with different kids who have autism, Attention Deficit Hyperactivity Disorder (ADHD), Down's Syndrome, and other conditions. The coordinator is a very important actor in the collaboration system. They are responsible to follow up the situation of the kid and planning for the care and upkeep of the child from the point of diagnosis onwards. Each individual with autism will have a coordinator who arranges meetings for all stakeholders to sit together to discuss and plan the child's care.

Individual plan system

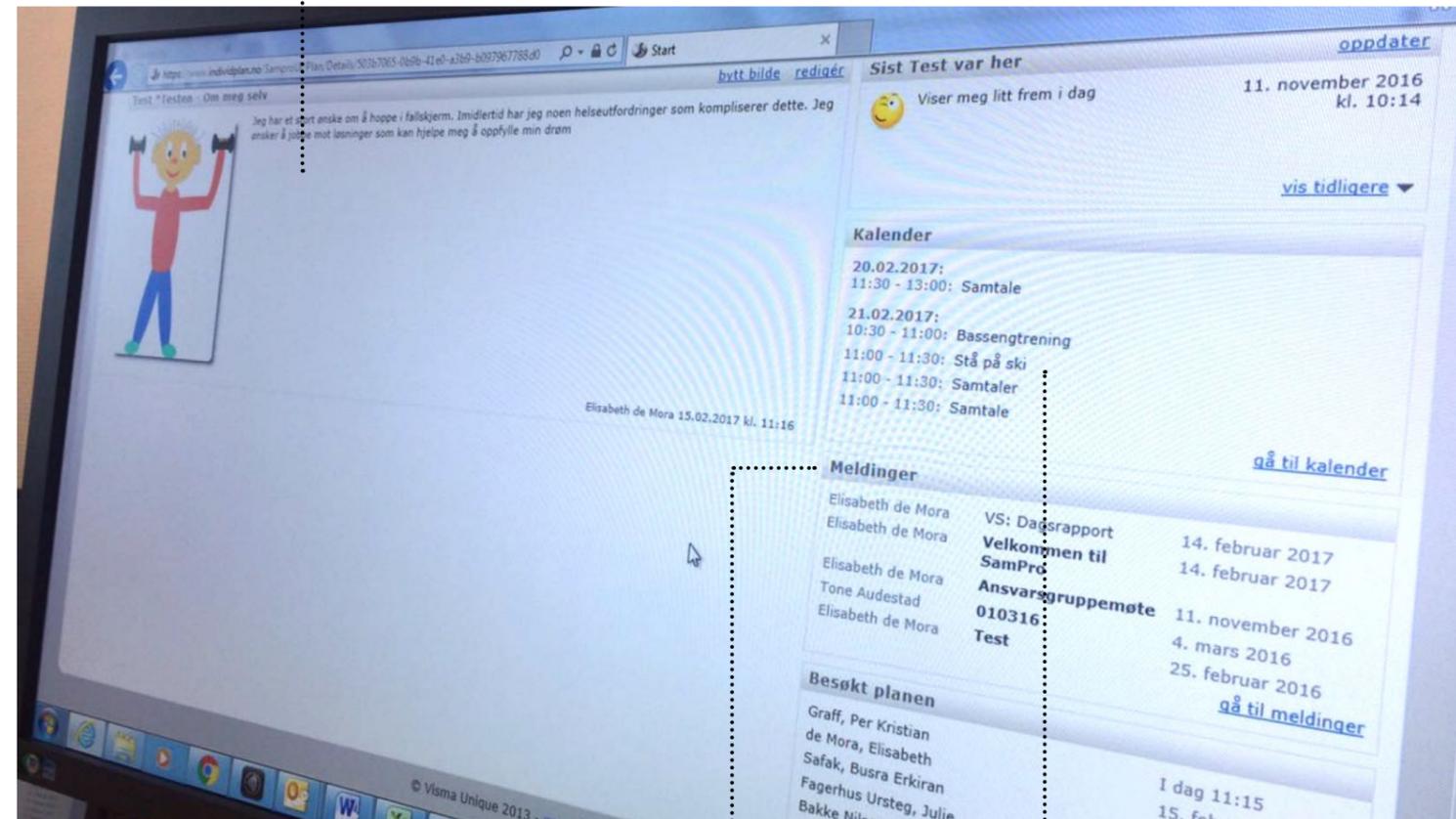
In Norway, there is an individual plan system, which is a collaborative tool for stakeholders to communicate, organise, and make plans concerning the concerned individual with a neurodevelopmental disorder. The coordinator is responsible for organising this tool.

Stakeholders can use the individual plan system to communicate information about the autistic individual. They can set goals for the individual's future progress, allotting a particular responsibility to each stakeholder in order to help the child achieve the goal.

However, according to Per Kristian, only a few parents are using this tool. Stakeholders usually call or text to coordinate. As the individual plan system is a website, it can be arduous for stakeholders to login and manage the system everyday. They may not have the time. As Per Kristian said, this tool should be developed to meet the needs of all stakeholders, and it should be made easy and accessible.

There is no structured way to register information.

" Most of the people just put all the info of the kid here, the health info, behaviour info...It is hard to pick up some info when you need."



Parents/caregivers/teachers prefer to use phone or message to contact which is faster than email.

" The parents don't use the email often, they usually call us or text us which is more convenient for them."
- Coordinator

Parents/caregivers/teachers prefer to use Google Calendar or other calendars that they are used to.

" It is hard for us to use two different calendars at the same time."
- Parents



Frode , father of kid with autism

Frode is Adrian's father. We partnered together on Adrian's project. For this present project, I interviewed Frode to get a better understanding of the challenge parents face in collaborating with other stakeholders.

He said collaboration is a big challenge for most of the parents. And they are not satisfied with the situation now.

Parents usually communicate with other stakeholders via telephone or through use of the notebook, instead of the individual plan. He complains a lot about the individual plan, which is hard for parents to use.

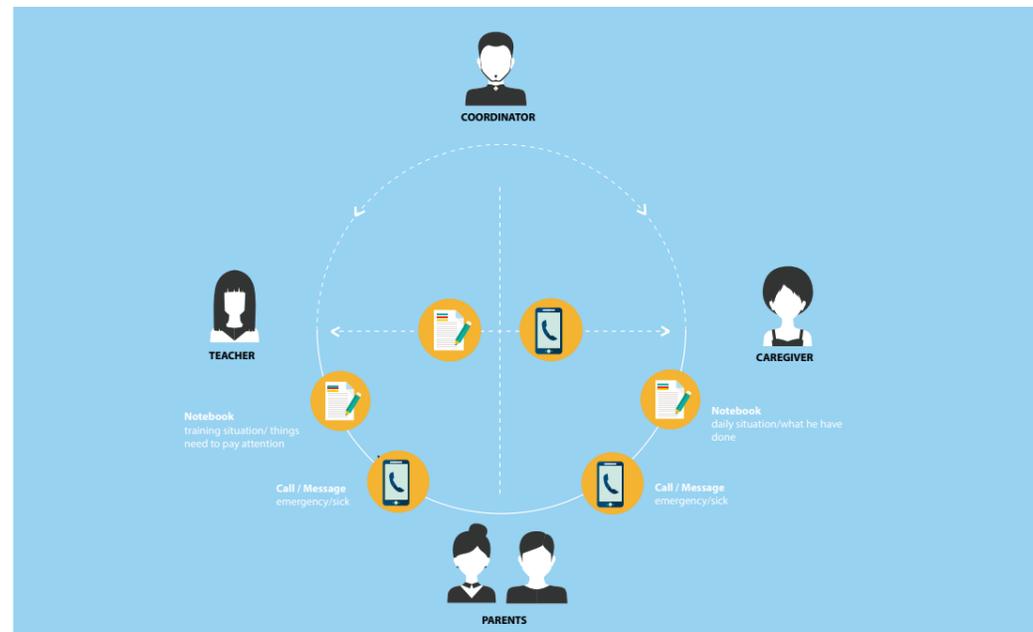
Frode complains that the notebook doesn't completely meet his needs either. While the notebook does give parents a way to get to know their child's situation, the information communicated through this medium is very general. They want to see more details about the child's day, for example, the child's progress, achievements, or other interesting things that happened.

“ It is just very low-level information, you can't use this information to suggest any changes to his life.”

“ I need a place to store and update all the information about my kid, like his behaviours, history, and the important things to take care of him. All the stakeholders can contribute to it, share the knowledge about the kid which helps us have a better understanding of him.”

“ It would be great if there have a platform, I can just log in to see the picture of what my kid did today! ”

For Frode, collaboration is more like shallow social communication to get updated on the highlights of what is going on. It is not useful for communicating a full picture which includes all the relevant information necessary to make changes to the child's life. Frode has also struggled to find out what his child likes. He has asked the care home and activity centre if they have any ideas as to what his child may be interested in. There are a lot of people working with his child and they must have some ideas about his interests or skills based on the time spent with him. However, this insight is generally not shared, apart from during the meeting held twice a year.

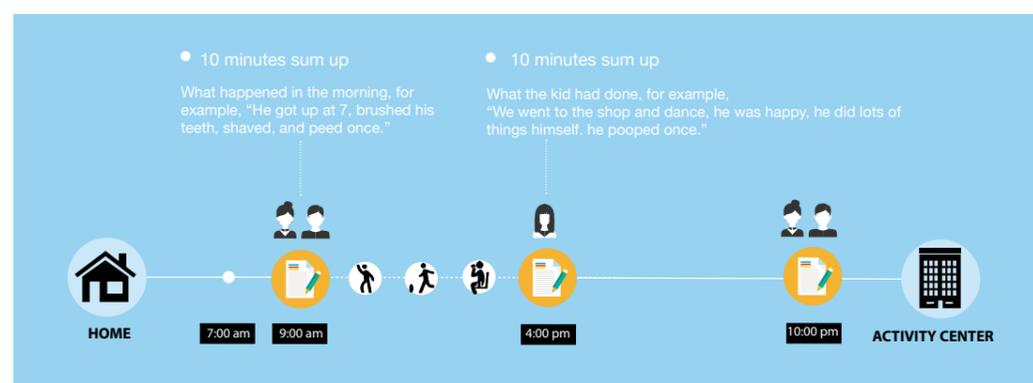


Conclusion

Stakeholders usually use the notebook to record the daily situation of the individuals that they support, and they use phone calls and messaging to communicate with one another.

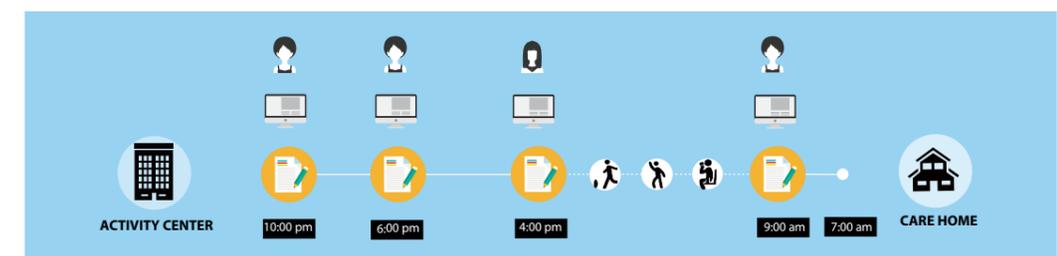
One week at home

In Norway, autistic individuals usually spend one week with their parents and one week at (Avalstning) care home. When they stay with their parents, parents will take 10 minutes to sum up the child's activities for the morning, then the child takes the book to the activity centre or to school. The caregiver or teacher will take note of what the child did during the day time. At night, parents will take note again.



One week at care home (Avlastning)

Care home and activity center have the same computer system which can safely record health and food information to exchange with each other. But they also write everything in the notebook. The reason they write the info twice is because the parents don't have access to the computer system, since their kid live at the care home for the whole week, parents can't see them, so the notebook is for the parents to follow up their kid's situation.



Insights

After exploring the current state of collaboration between stakeholders, the next step is to draw insights which will help me to develop a solution. Here are six main useful insights:

1. Some important information like health, food, and toilet cannot be documented in the notebook due to security concerns.
2. Lack of information analysis.
3. Valuable information always gets lost through the collaboration process.
4. There is no direct communication channel between stakeholders.
5. The trajectory of the autistic individual's progress and achievements is undocumented.
6. Methods and techniques developed by caregivers, teachers, and parents are not recorded and shared.

Stakeholders' Needs

Parents

1. Open channels of communication to follow up on the situation of the kid
2. Knowledge sharing between stakeholders to ensure a common understanding of the child
3. Opening collaboration for planning for the child

Caregiver

1. Record and share basic information
2. Safe way to record basic information

Design proposal

Based on the findings from the research phase, I made a design proposal by framing the goals and objectives.

Create a digital tool for all the stakeholders (parents/ caregivers/ teachers/ coordinators) who are involved in the support system of autistic people. The aim is to collaborate together by sharing knowledge to *follow up the situation* of individuals with autism, organise and plan their lives to *get a better understanding* of them and enhance their lives.

4. Design process

This section will present how I define the scope of the platform and concept iterations. I will explain the methods, steps and evaluations in the development phase.



Scope

I made a map to illustrate main functions and features for the platform based on the research.

The functions are: recording, planning, and sharing. As you can see from the map, the everyday life of the child, the child's progress and achievements, methods and techniques between stakeholders, the child's general information, and plans and goals for the future are all important things which should be recorded and shared. The current challenges, everyday activity and roles and responsibility between stakeholders are the things should be planned.

Workshop & co-design

The project would be too broad if I worked on all of the functions included in the map. The scope of this platform should be defined so that I can focus on the most important aspects for stakeholders.

For parents, recording and sharing everyday activities of the kid are most important. For caregivers, they are more interested in the health and food information of everyday which would help them do their best job.

In order to understand what the most important information for different stakeholders is, I held a workshop with one parent and one caregiver.



Function & purpose map

In order to clarify the scope of the app, a function and purpose map was created.



Give all stakeholders the **overview of the kid's day**, what he/she had been done, the behaviour issues, health and food situation.

Caregiver/teacher and parents can **plan the activity much easier** based on the record of the day.

Give parents a **visual diary** which grows and evolves through the changing interests, experiences and achievements of their kid to understand them better.



Sum up and analyse the information which has been recorded to **get patterns and make adjustments for the kid's life**.



Give all stakeholders the overview of general information of the kid to **get a common understanding**.

Record the experiences and milestone to give all stakeholders **a vivid memory** of the kid's life.

Transfer competency to new arenas and new people.



Share the knowledge and experiences to **learn from each other**.



Communicate and **update the situation of the kid directly**.

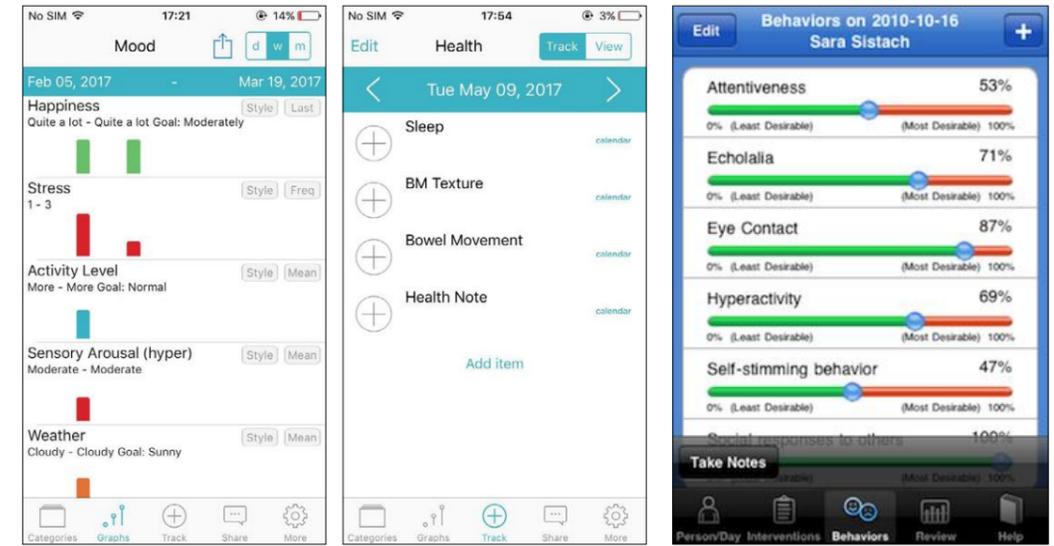
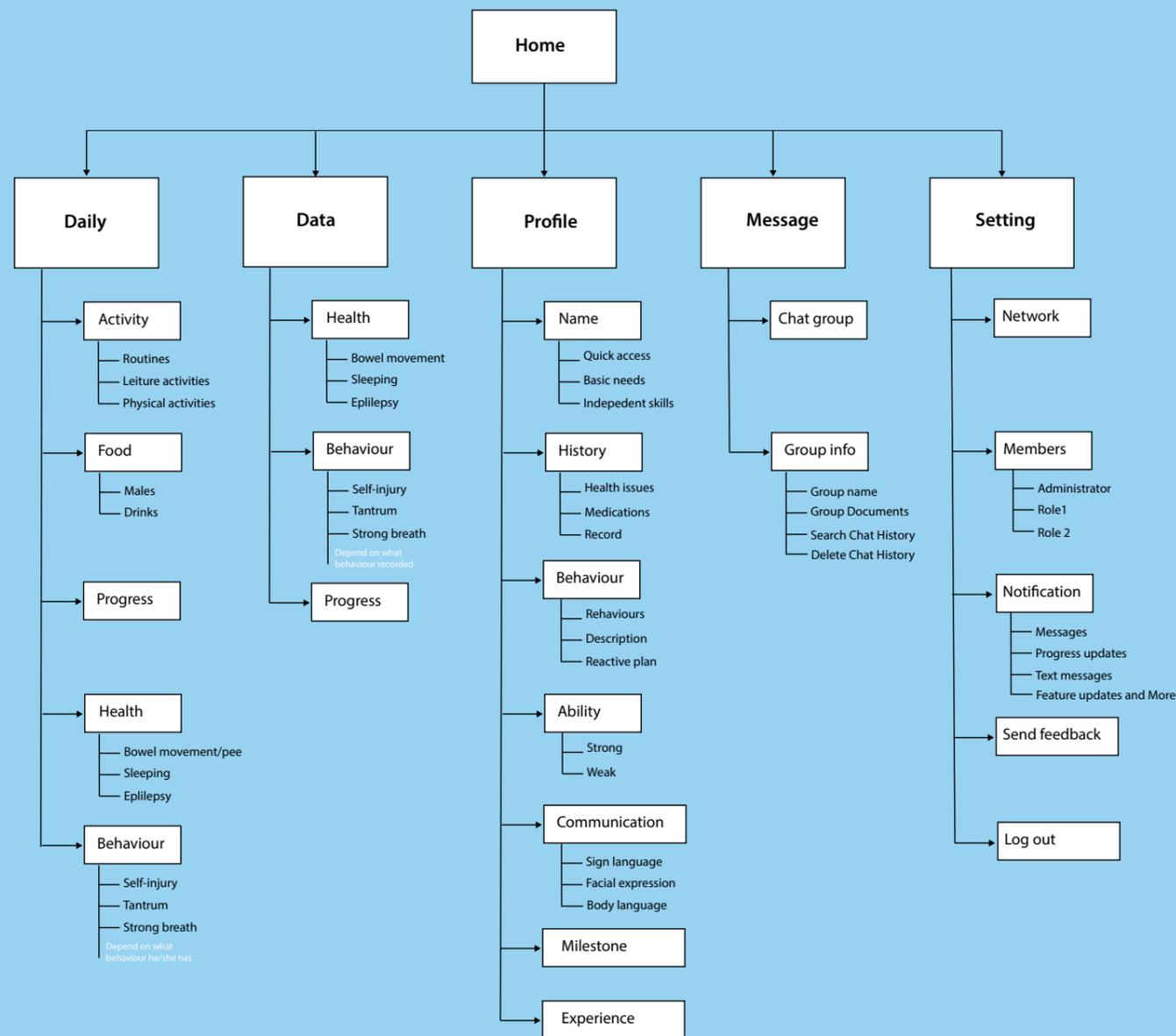
We prioritised all the features and make the different features more specific based on their needs. This map illustrated the results of this workshop.

Recording everyday life is the most important need for all stakeholders. Recording general information about the autistic individual is the second most important need.

During the workshop, the main functions of the app were decided: recording and sharing. Planning was not included as a main function because all the planning will be done based on what has been recorded.

Structure

Based on the function map, I made the information architecture to explore how the pieces of the platform will fit together and behave.



Existing services

I looked into the market for the existing services to get inspirations. There are only few products related to the collaboration for autism.

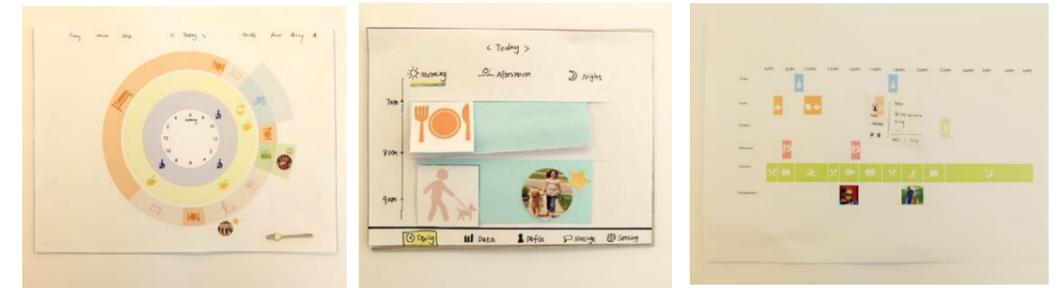
AustimTrack

The one on the left is AutismTrack which is for daily situation tracking, like mood, weather, health and behaviour. You can get patterns by the multi-item graphs.

Autismtracker

The one on the right is Autismtracker which is mainly for caregivers to track behaviours and symptoms. You can also discover the pattern and trends by graphs to make interventions.

Both of these apps are very specific, they are more focus on the health and behaviour. They do not focus on the daily situation of the individual and the information exchange between stakeholders. These apps function more like tracking tools, not collaboration tools.



Sketch & Paper prototype

I made sketches to dominate the early ideation stages before I start prototyping.

First paper prototype was made and tested with one parent (Frode) and my supervisor to get feedback.

The feedback were mainly focused on four points below:

They really like the data analysis function which would add a lot of value to the autistic person's life.

There would have different ways to record and show the daily situation of the person which I should continue to explore.

The platform should allow quick access to general information concerning the individual for new caregivers and teachers.

Explore recording

Based on the feedback, I had a section to explore the different ways of recording.

There are different groups of information that should be recorded: toilet, food, drink, activity, epilepsy (if applicable), and achievements. I used circles to illustrate the different categories, which is an effective way to display the general information from the last 24 hours. And I also used timeline which is a typical way of displaying a list of events in chronological order.

I tested these prototypes with different people to see which model was more comprehensible. The circles seem too complicated for most users. Feedback indicated that the circle design was novel, but the specific time of the events is difficult to ascertain and compare. The timeline was must easier to navigate.

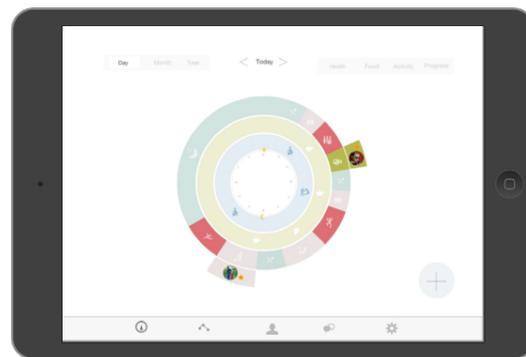


Iterating forward

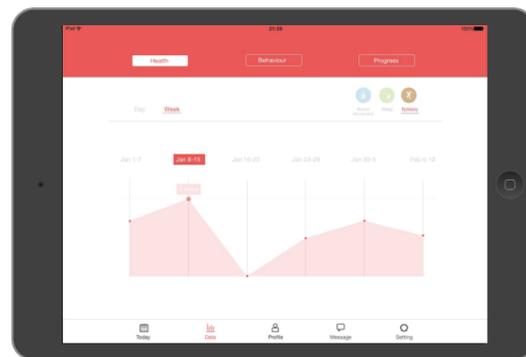
My approach is based on quick iterations with testing and feedback driving the process.

In total, there were four iterations. I will only discuss the significant ones.

Version 1

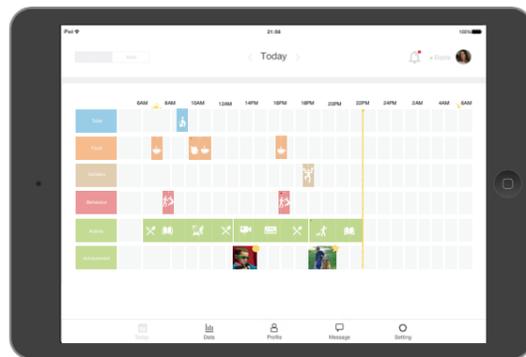


Recording

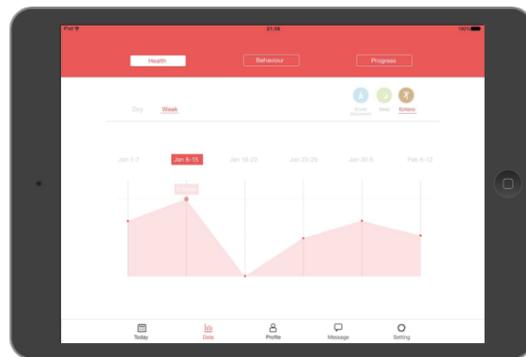


Data analysis

Version 2

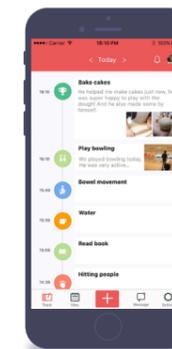


Recording

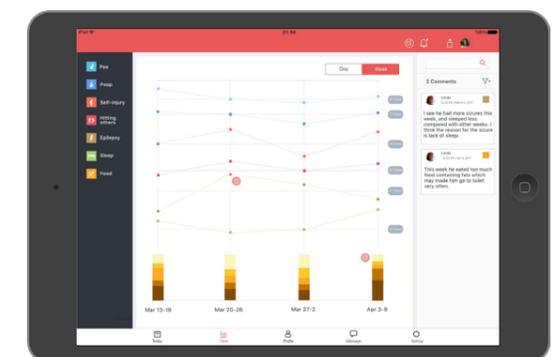


Data analysis

Version 3

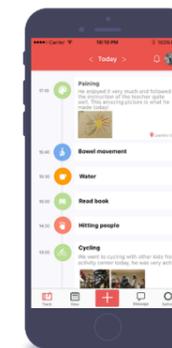


Recording

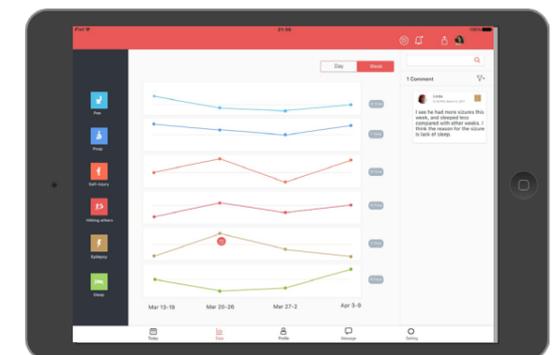


Data analysis

Version 4



Recording

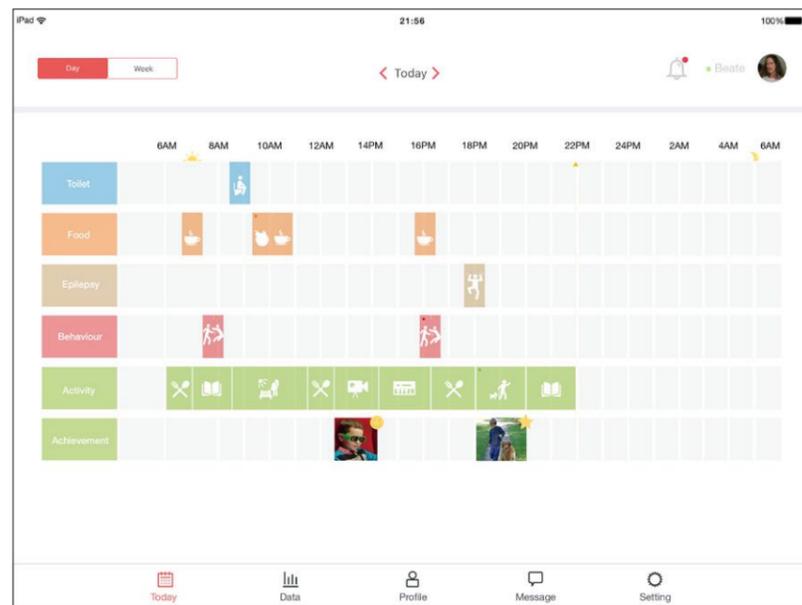


Data analysis

Version 2

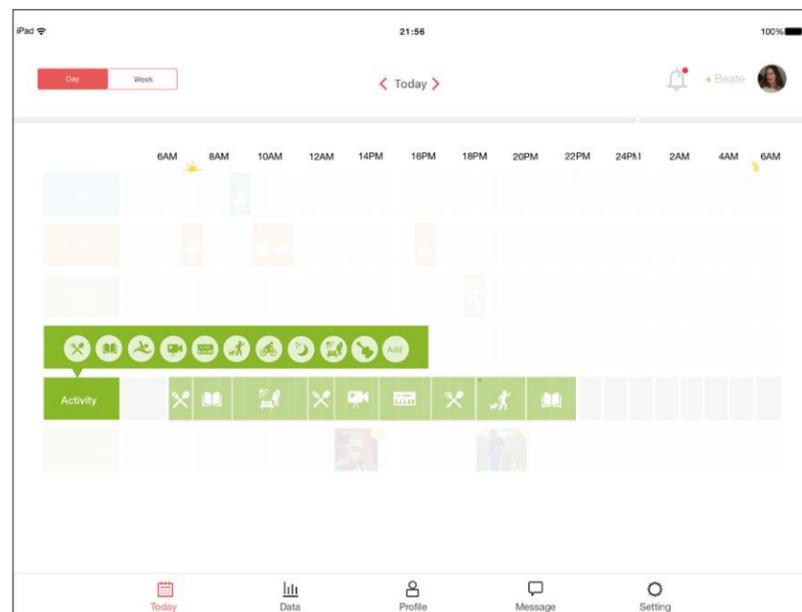
The Version 2 is a digital prototype which was created based on feedback received about the paper prototype.

Timeline was used to illustrate the daily situation.

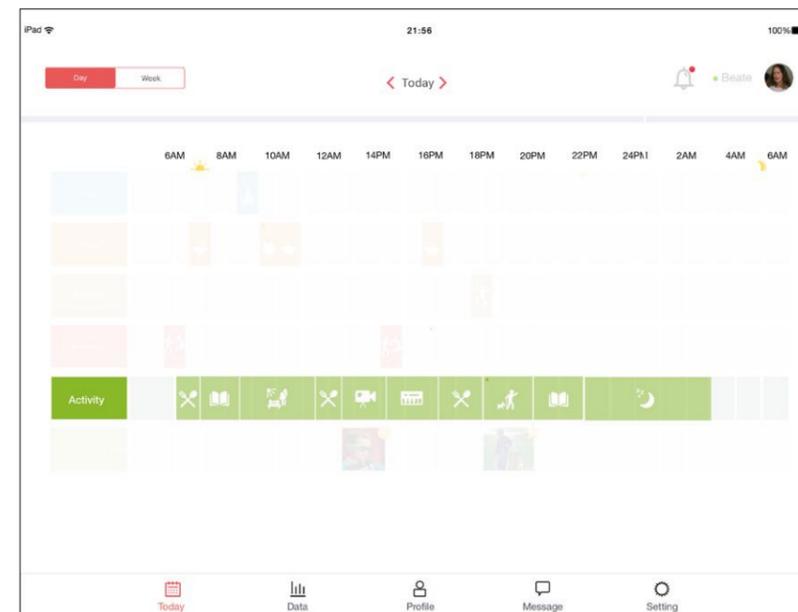


Recording

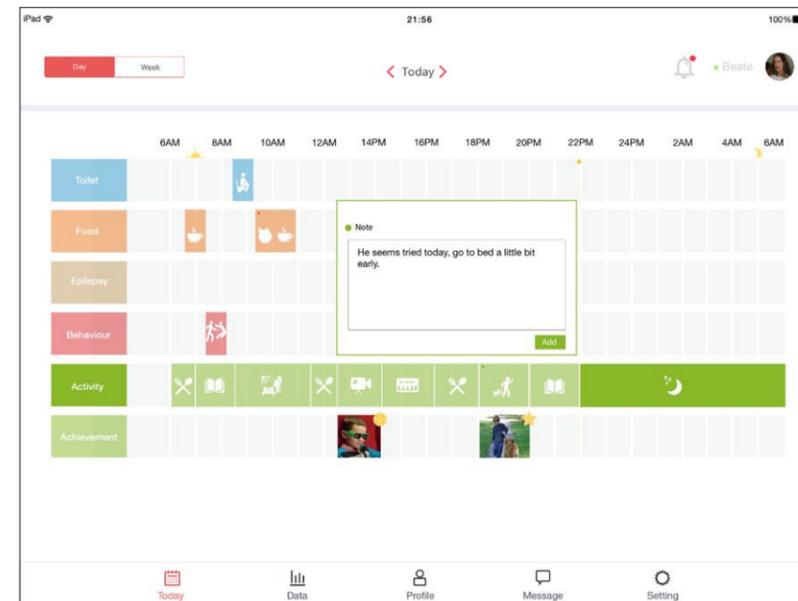
Caregivers/parents/teachers enter the homepage of the app. The homepage also serves as the main record-keeping page. There are different categories for information to be recorded.



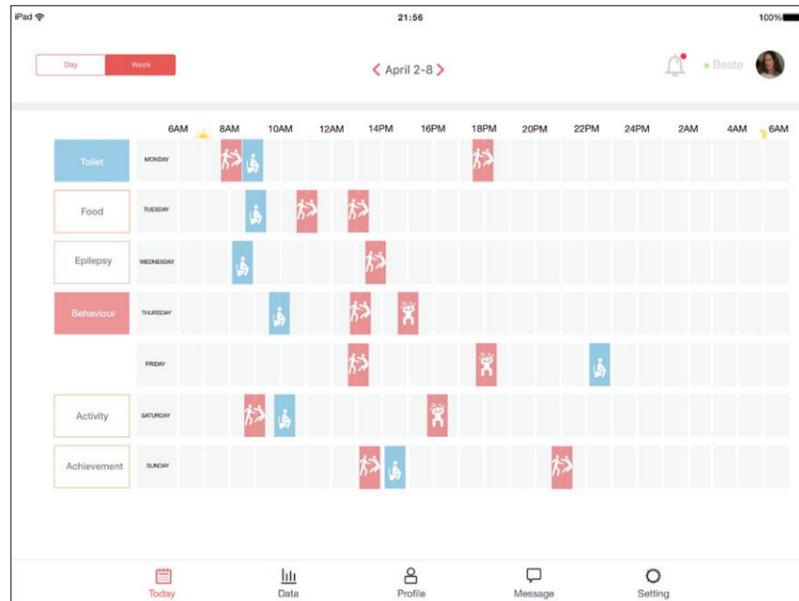
They choose one category to register. For instance, they choose to record the sleeping.



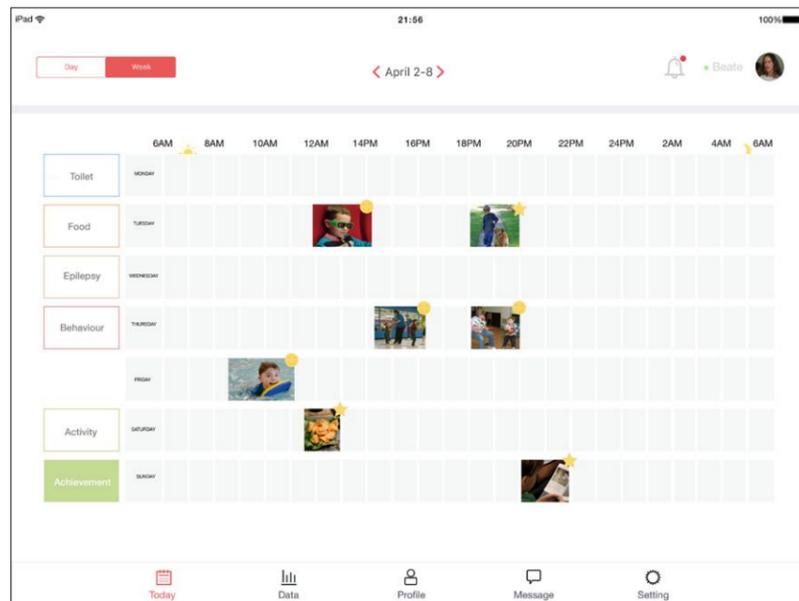
Sleeping is recorded, they can adjust the time by changing the width of the rectangle.



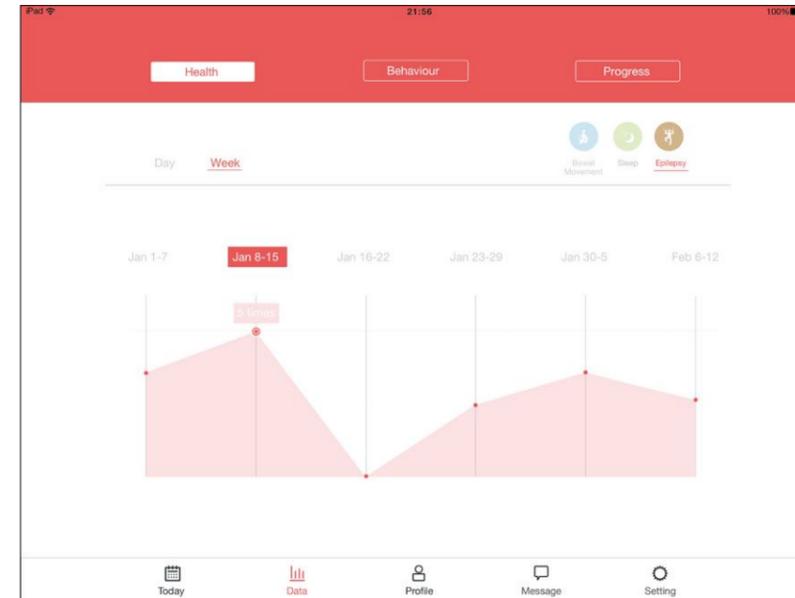
They can also add note to explain it in detail.



Users can get an overview of the whole week by choosing different categories and compare them to get patterns. For instance, by viewing toilet and behaviours, people may find that he/she usually went to toilet, and always exhibits hitting behaviour before going to the toilet. This helps the stakeholder better understand the individual, because the stakeholder would recognize that the individual hitting them is communicating a need use the toilet.



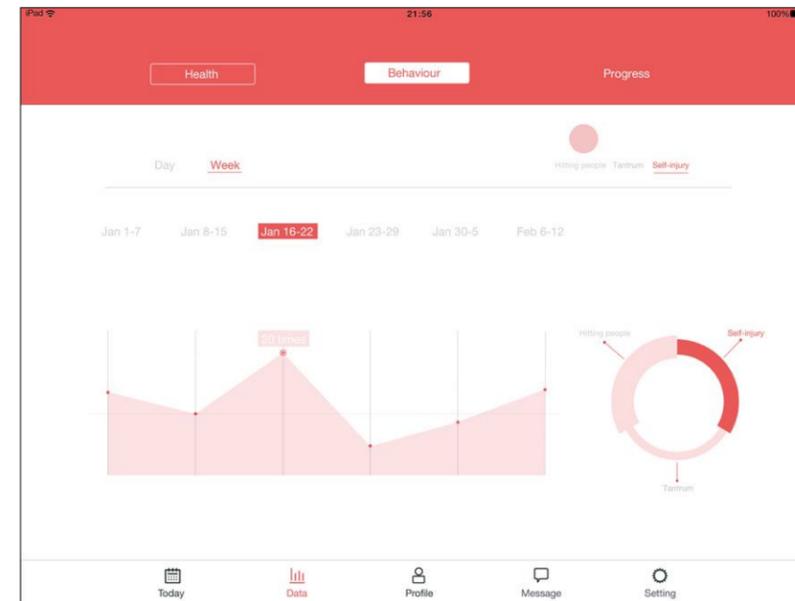
Here they can also get the overview of the whole weeks achievements which give stakeholders a visual diary of the person.

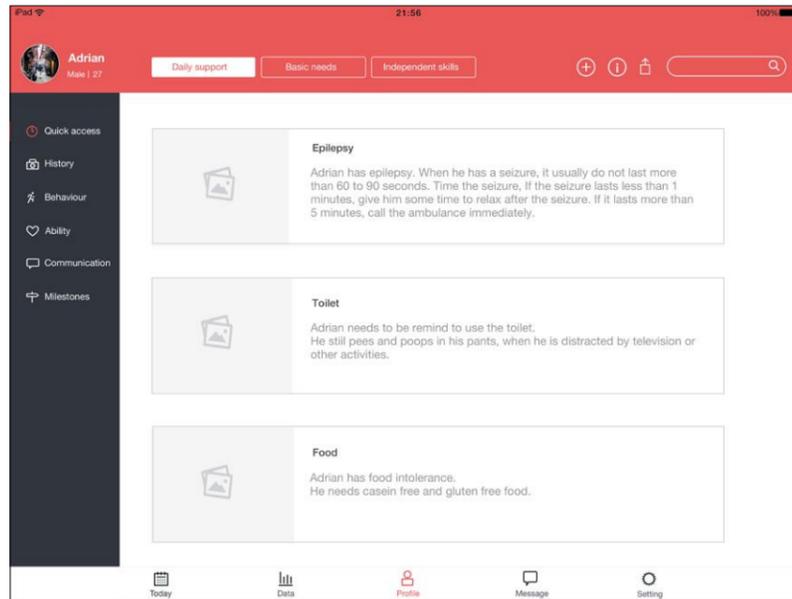


Data analysis

The recorded data will be summarized and analyzed. There are three main categories of analysis: health, behaviour, and achievement. The health includes toilet, sleeping, and epilepsy, and behaviours may include hitting, self-injury, and tantrum. It depends on what behaviours have been recorded.

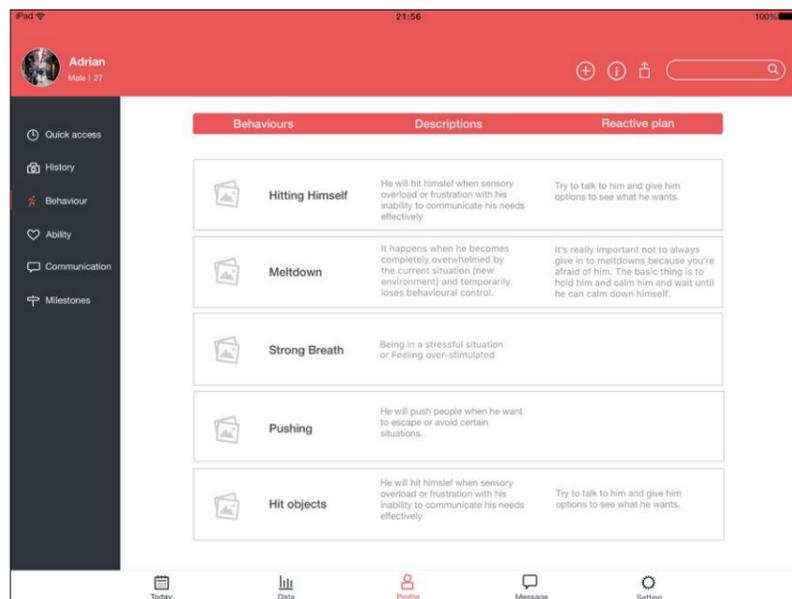
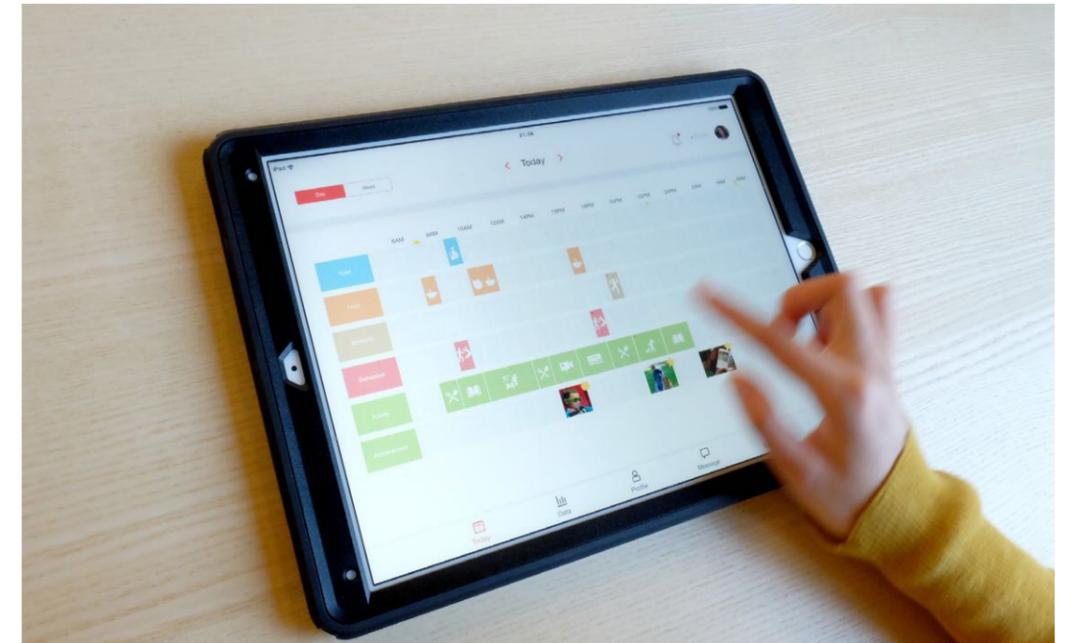
People can get a sum up for different weeks. For example, this page shows that the changing trend of epilepsy during the different weeks.





General information

The third function is the general information which identifies the autistic individual. It also acts as a platform for sharing experiences and knowledge about the person by building, allowing stakeholders to build a profile together.



Different people may have different strategies for managing any challenging behaviour exhibited by the autistic individual. It would be helpful if all the people have a common understanding of the meaning of his/her behaviours and the strategies for managing the behaviour by sharing knowledge and experiences.

Feedback & Reflection

The first clickable prototype was evaluated in the meeting with Frode and one caregiver from activity center. The feedback was mainly focused on two points below:

1. Useability of Recording

When testing the recording function with users, I found that it was difficult for users to understand the interface, it took lots of time to accomplish a recording task and the operation was hard for them to learn.

They said that the method for inputting information should be easy and time-saving. Since this platform is designed for the tablet, it would be inconvenient for caregivers or parents to carry around the tablet to track the information everyday.

2. Data analysis

They said it was great to have the data analysis function which would help stakeholders identify any trends in the child's activities or behaviour and then make the necessary adjustments. This tool is precisely what they need. But this function should be more developed, now the data analysis function seems too simple. I should think about what kind of data analysis can give more value to them?

Taking a step back

I agreed with the feedback I got in this iteration, the recording operation is hard to use, and there should be simple way which is easy to use.

And the data analysis function should be more developed to meet their needs.

Then I decided to take a step back to rethink of the context in which the platform is likely to be used. It would help me to rethink about the user's need and the user experience I want to improve.

Recording

When they use it

Will the stakeholders record the data at the end of day to just sum up the situation or they record it anytime at anywhere? I think the data could be much more accurate and valuable if it can be recorded when the event happened. This means the recording must easy to use and time-saving.

How they use it

Stakeholders may have to take the tablet everyday to record the events which is not easy, especially when you have to use it a lot in daily work. Compare tablet and phone, phone would be much easier to use in daily work which is suitable for registering information.

Data analysis

When they use it

Stakeholders will track the data daily, but may not check the summary of the data everyday. The summary will be checked every week or every few weeks.

How they use it

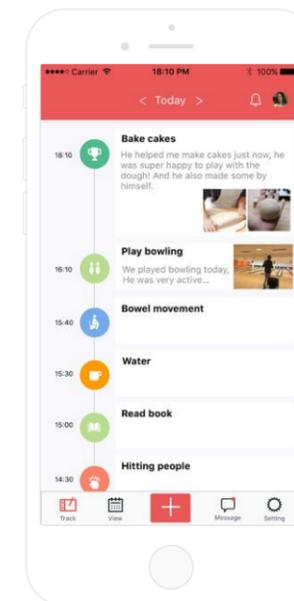
When they see some data which is valuable, they may want to share with other stakeholders and discuss with them to make adjustments. Is there anyway to help them to exchange ideas?

Version 3

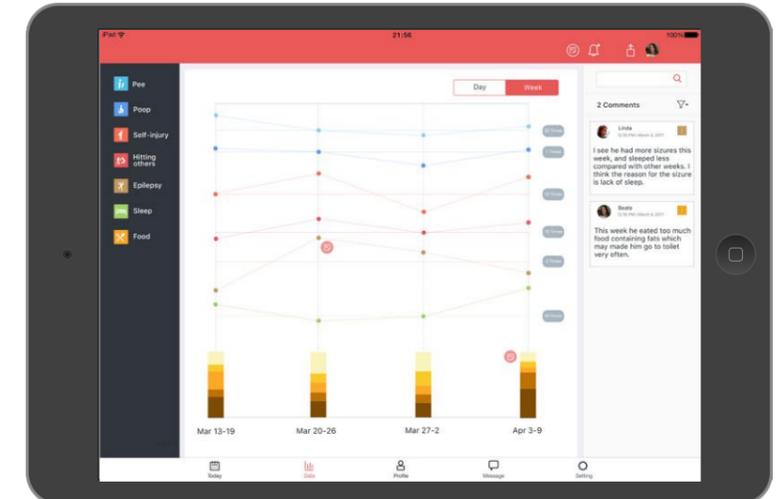
Based on the feedback from Version 2, I decided to produce two versions of the app, one for phones and one for tablets.

There only have recording and message functions on the phone. On the tablet, there have data analysis and general information functions. People will use the phone to track data and contact with each other everyday, and use tablet to get an overview of the data and the information of the person every week or every few weeks.

For iteration 3, I focused on the recording and data analysis functions, which are the most important functions for users. I redesigned the recording function for the phone, with the objective of making it as easy for stakeholders to use as possible.

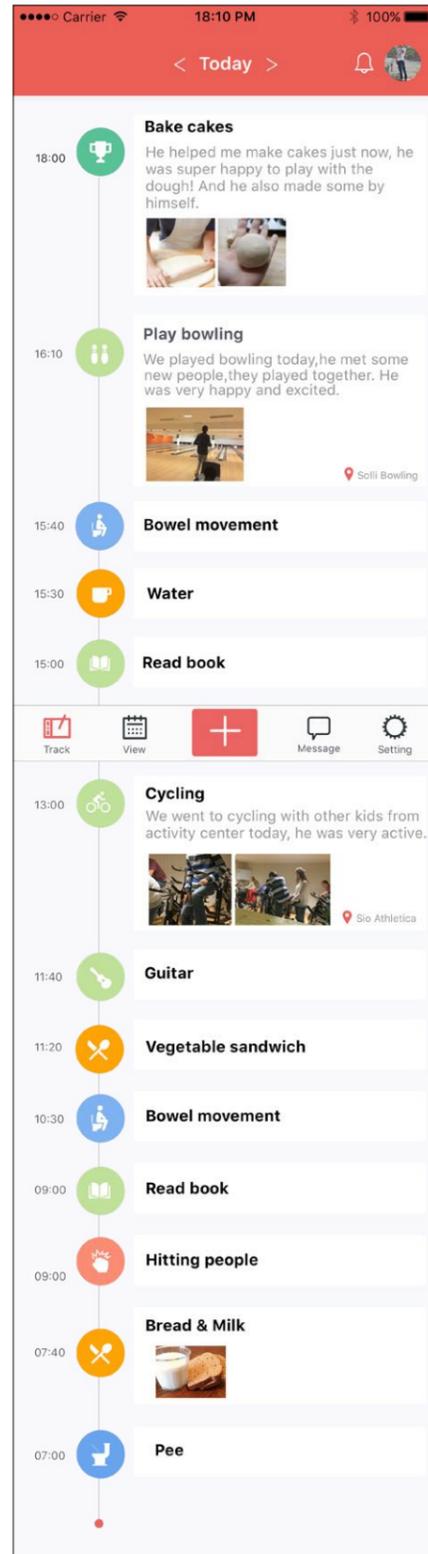
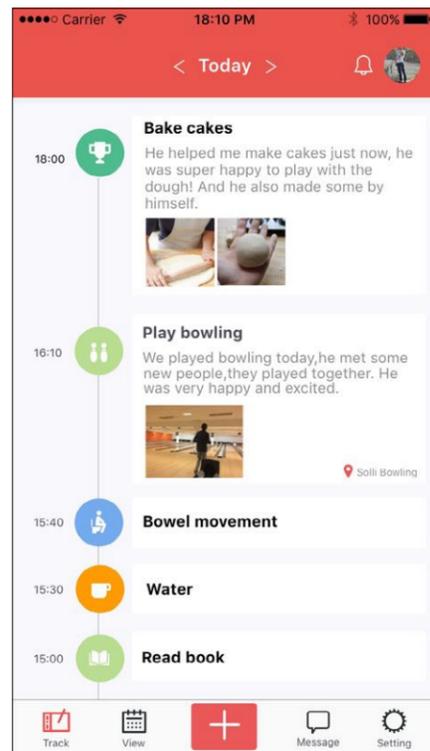


Phone-Recording



Tablet-Data analysis

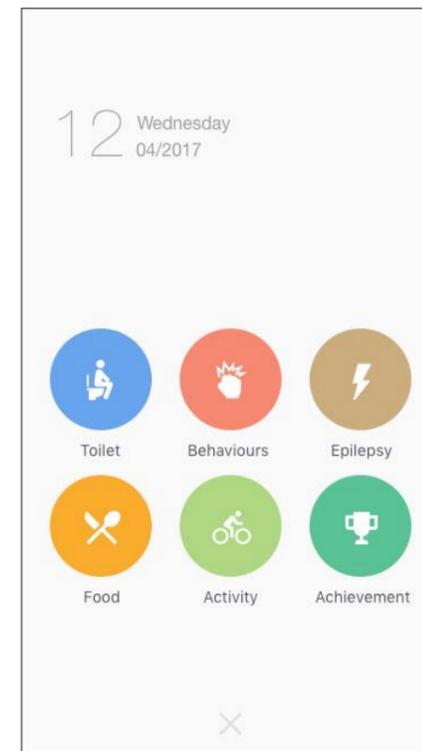
Phone - Recording



Timeline

I redesigned the way that the daily information is displayed. A timeline is used to illustrate the events which are recorded to give a detailed overview of the daily situation.

I put the newest event on top so that the events are displayed in reverse chronological order. This allows users to have a clear view of the individual's current status. They don't have to scroll up to check. On the navigation bar, you can change the date to check the situation of different time.



Categories

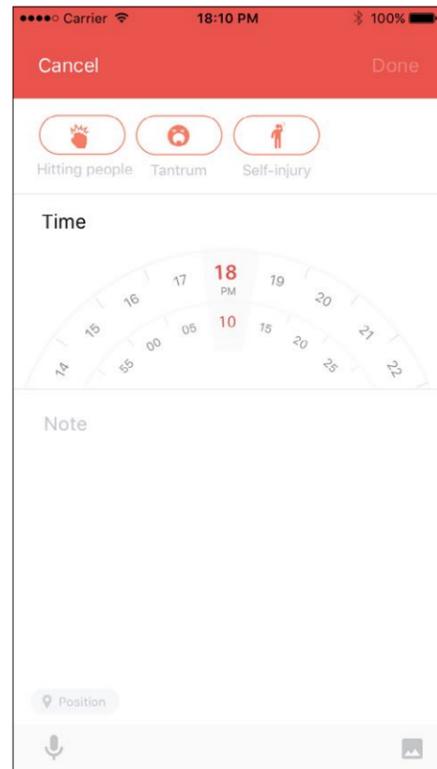
Users start recording by tapping different categories. There are six categories. The categories can be customized to the need of users. For example, those individuals who do not have epilepsy will not need this category.



Overview

At any given time, stakeholders may only be interested in the most relevant information. For example, it is very important for caregivers to know how many bowel movements the individual has had on that particular day.

A general daily overview would help stakeholders have a basic understanding of the daily situation of the person and pick up the information they need.



Record detail

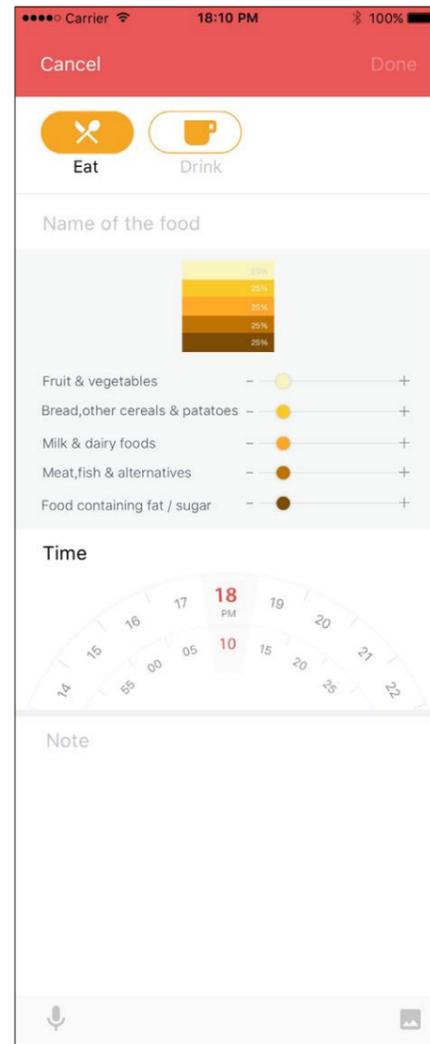
The principle of redesigning the recording function is that the interface should be easy to understand.

It should take less time to accomplish a recording task and the operation should be easy to learn.

Category, time, location, note and pictures are essential to describe an event, which would give users a vivid understanding of the situation.

Therefore, I have included all the specific aspects for recording on one page so that the information can be received with a glance. I have minimized the number of clicks required to read the information on this page, in order to make it very simple.

I explored different ways of use for the recording page by testing prototypes with users, before settling on this design.



Data analysis on tablet

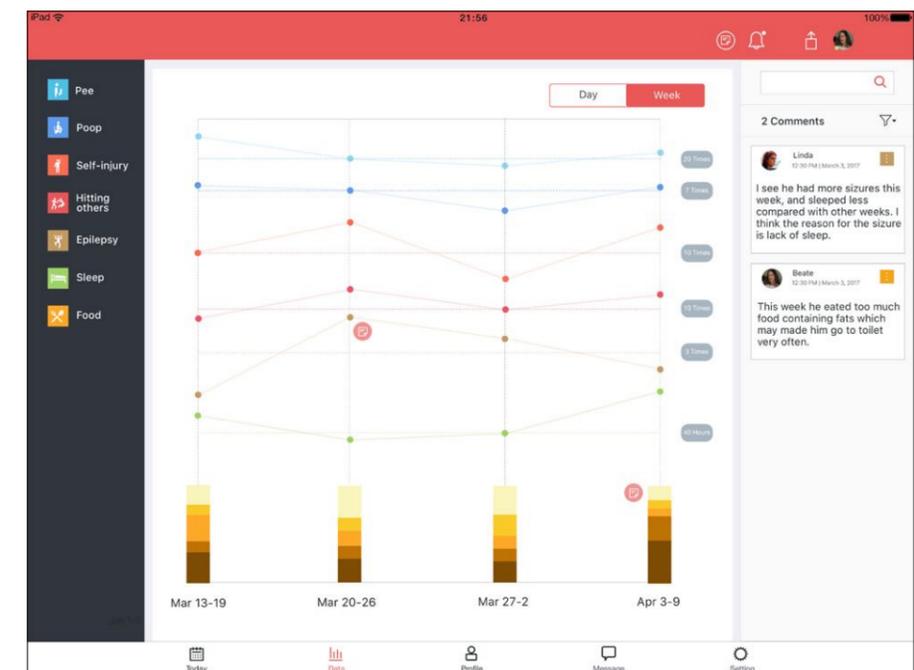
All the recorded events on the phone will be summed up and analysed in the tablet version.

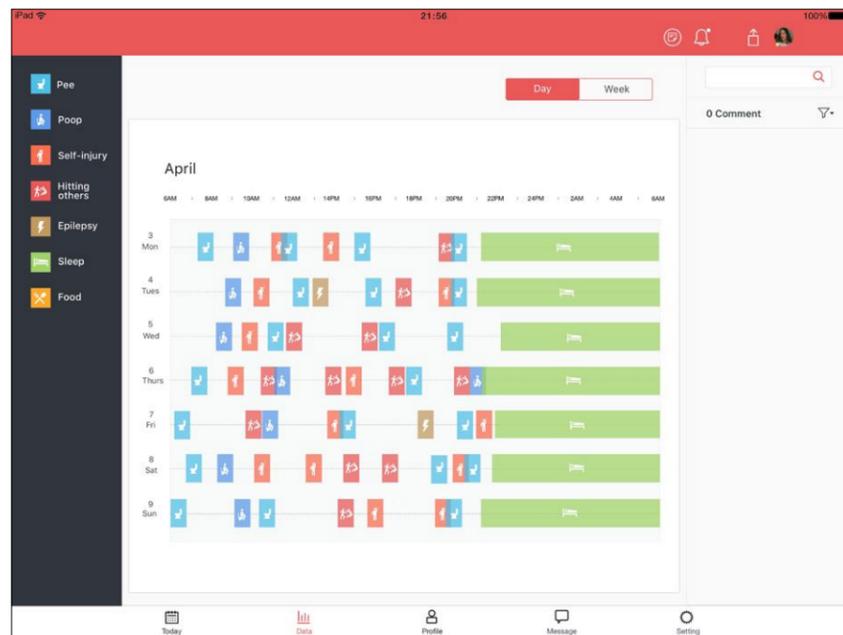
Compare data

This illustration shows the changing trend of different categories in four weeks.

In version 3, I included all the data on one page, which makes it easier for the user to analyze the overall status of the user. This is helpful because some variables are related. For example, sleep deprivation can trigger seizures. From the illustration on the left, we can see that the increase in frequency of epilepsy is associated with a decrease in sleeping hours. Then users can realize that why the person has more seizures recently and make adjustments for him/her. It is a good way to analyze and identify trends by comparing different categories.

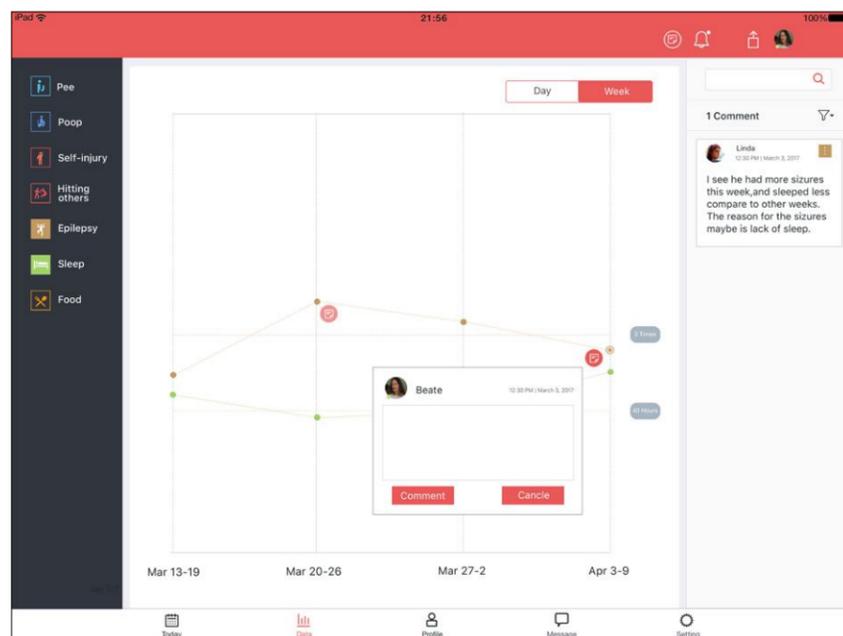
Users can make comparisons by choosing different categories.





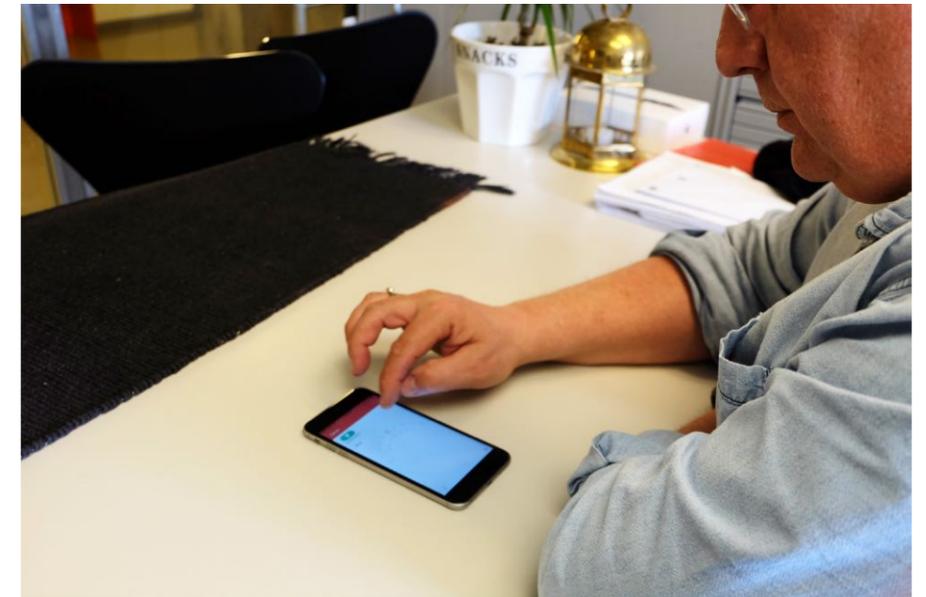
View by day

Users can get a detailed overview by week. It also gives users a way to identify the patterns. For instance, from the illustration on the left, user can easily get that the person always has a bowel movement in the morning and sometimes has hitting or self-injury behaviours before going to the toilet. When the individual exhibits these behaviours, it is probably a sign for toilet.



Add comment

Users may want to share thoughts and ideas when they find some patterns which are valuable. Adding comment gives stakeholders a way to share ideas about the patterns and make adjustments together.



Feedback

The prototype was showed to the parent (frode), coordinator and caregivers.

The feedback was mostly positive. They said it is smart to split the funtions to different devices. Using phone to track is much easier and simple. The coordinator was very satisfied with the platform I developed. He said this app is really functional, the way to register is easy and efficient. And the data analysis is much more improved since last time. But there are some parts still need to be improved:

1. Food record

The food was recorded writing the name of the nutritional category of the food. However, users said that they only want to know what food the individual has eaten and when they ate. The food categories do not add any value.

2. Security

Since it is an app with sensitive information, information security should be considered.

Every time when caregivers/parents open the app to record, they may need to log in. This may take time, so how to make it easy to log in every time ?

3. Interface of data analysis

The interface of the data analysis is confusing for most of users.

4. Icon

The icons which are used to describe different categories are too detailed which are hard to recognize.

Version 4

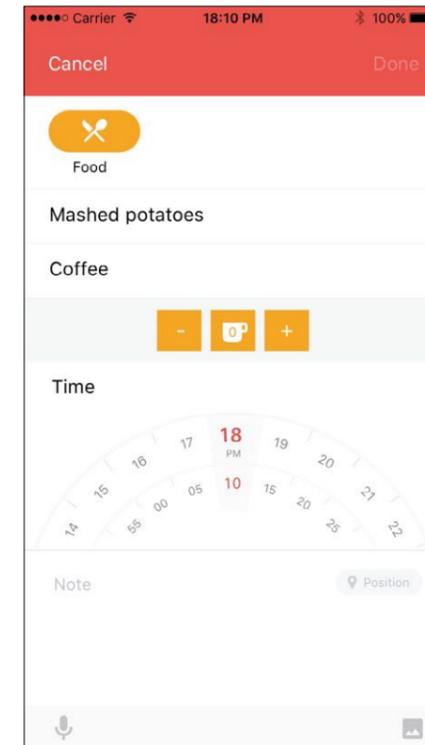
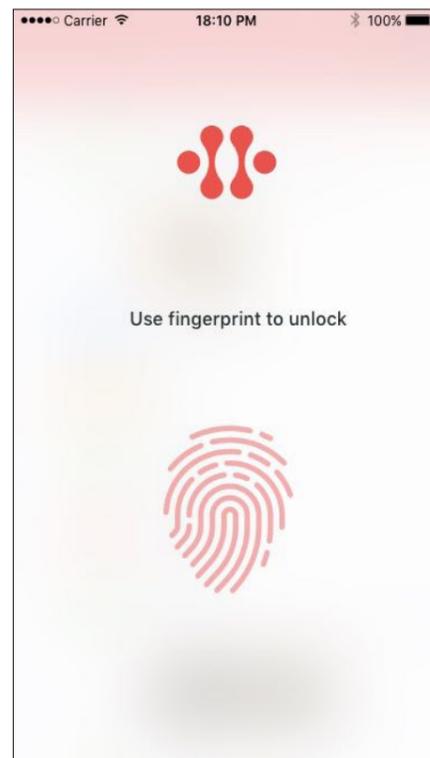
In version 4, I will apply the feedback from the last version in order to improve the prototype. There is a consensus that the app is logical, therefore, the changes will not be significant.

Log in

Every time when parents/caregivers/teachers open the app to record, they may need to log in which is a good way to secure the sensitive information. However, this method takes time, which is inconvenient. It should be quick and easy.

Nowadays, there are different ways to unlock a mobile phone. Voice login, fingerprint login, and pattern login are some examples.

I think that the fingerprint method would be an easy alternative to the passcode method. It would prevent unauthorized access to the platform and secure the information.

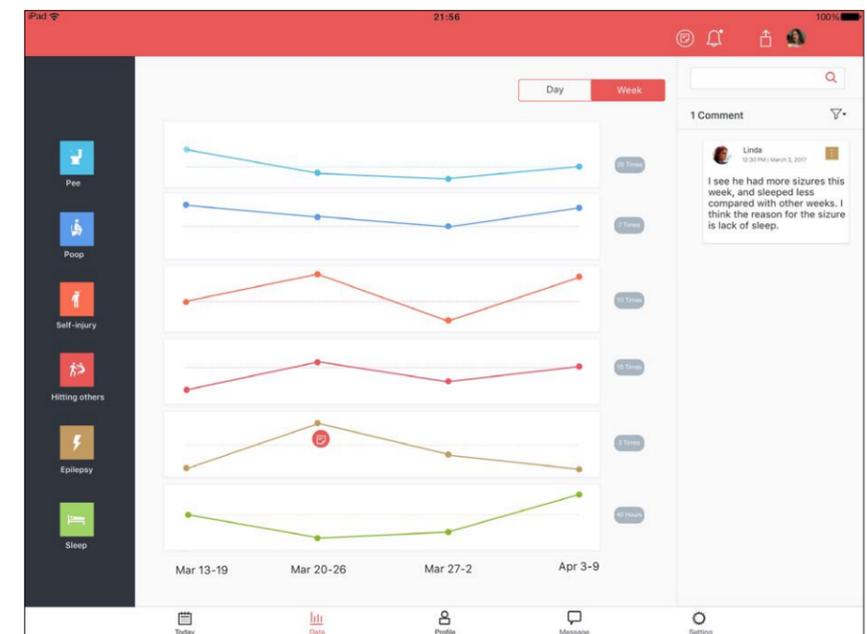


Food recording

As we discussed in the last version, recording the food categories doesn't add too much value for the users. They care more about the general information like what the person eats and drinks which would give them an overview of his/her food information. For instance, some people are only allowed to drink 3 or 4 cups of coffees one day due to the health issues. The stakeholders need to know how much coffee the person has drunk today when taking care of them.

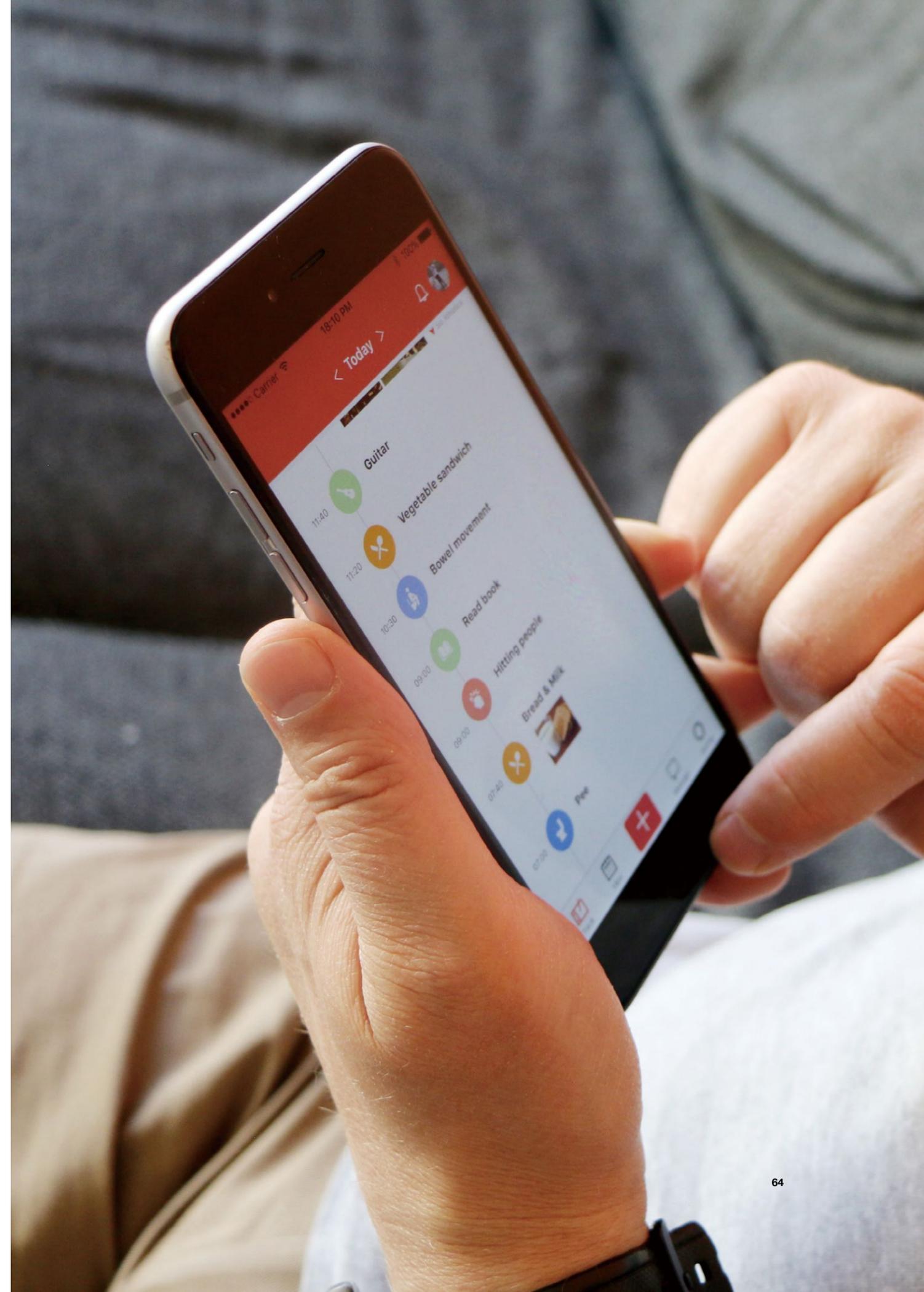
Interface of data analysis

I redesigned the interface of data analysis by separating different curves to make the data easy to see and more comparable.



5. Design proposal

This chapter will take you through a description of what Know Me is (phone version and tablet version), and the technical specifications that describe how Know Me works.





Digital platform—Know Me

Know Me is a portable, customizable digital platform for stakeholders to collaborate by recording and sharing the daily situations of the individuals with autism, analyse their lives to get a better understanding of them and enhance their lives.

Easy to Use

It takes only a few minutes to enter the daily information. Information is entered in a simple, easily understood format.

Pattern Discover

It gives stakeholders in the autism community, more information on their search to discover the unique patterns and trends experienced by individuals with autism, which would make a difference in helping their loved ones to learn and grow.

Customizable Track

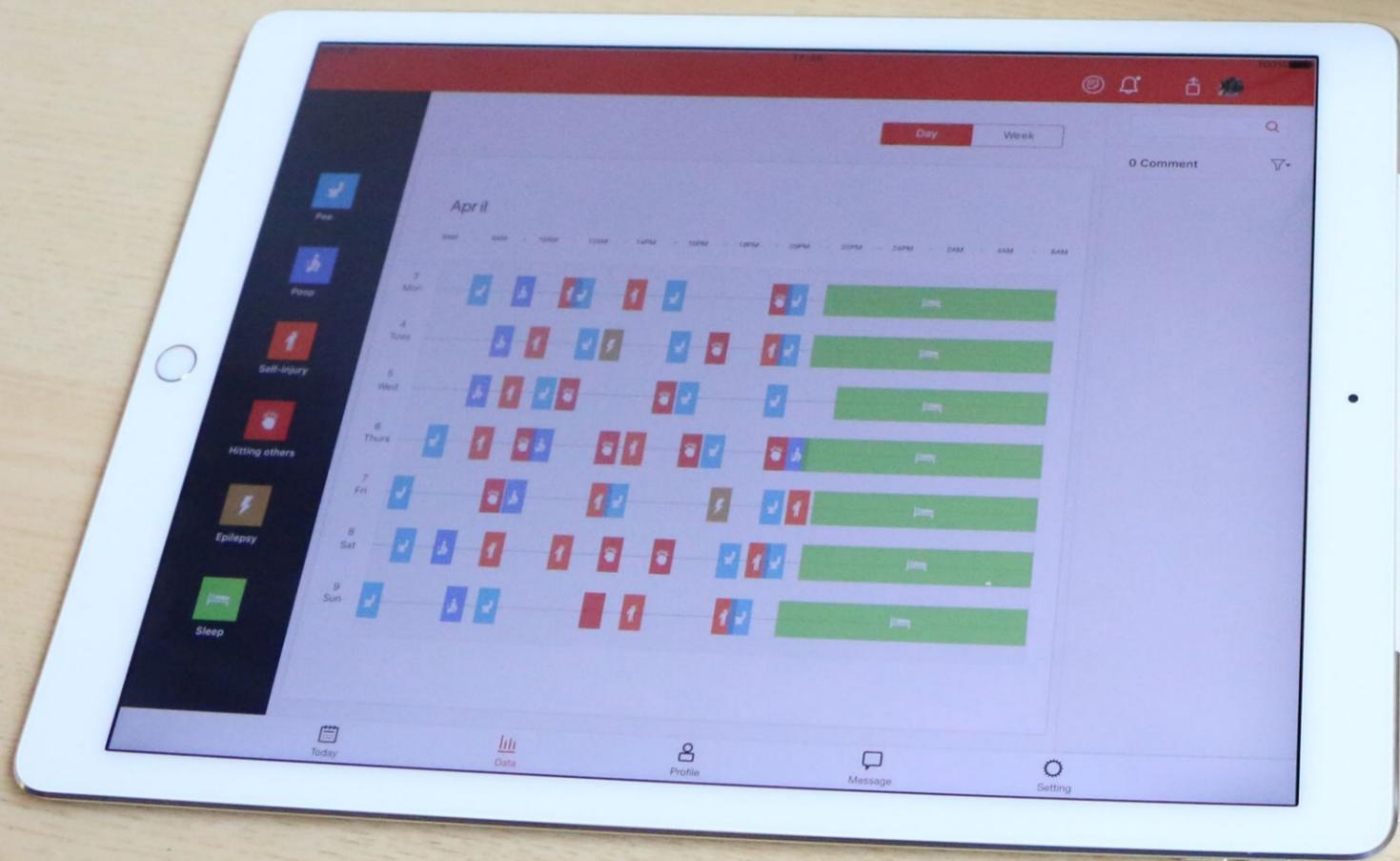
It covers all the daily tracking needs for stakeholders. Not only does it track medical and health information, but daily activity and achievements can also be registered, which gives parents piece of mind.

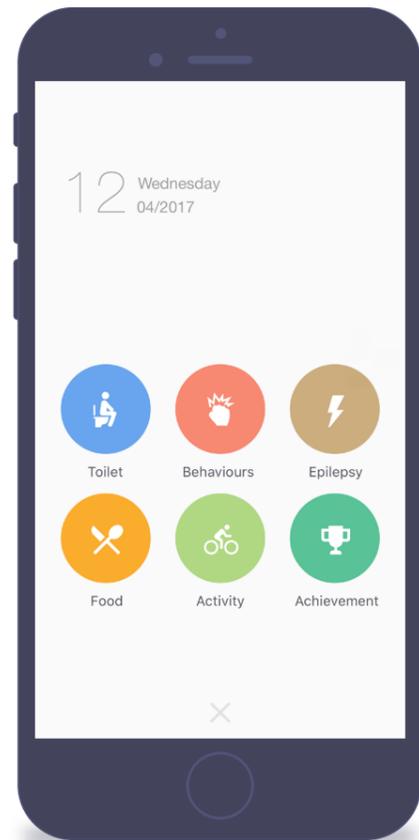
Any Person, Any Time

Multiple stakeholders can track a single child. This is useful for the exchange of information between stakeholders, and for achieving consensus around the child's current performance level. Also, multiple profiles may be created within one account (e.g., to track several children).

Phone And Tablet

The functions of KnowMe are separated to phone and tablet. Users will use phone to record the data and use tablet to get a summary of the data to get a understanding of the person.



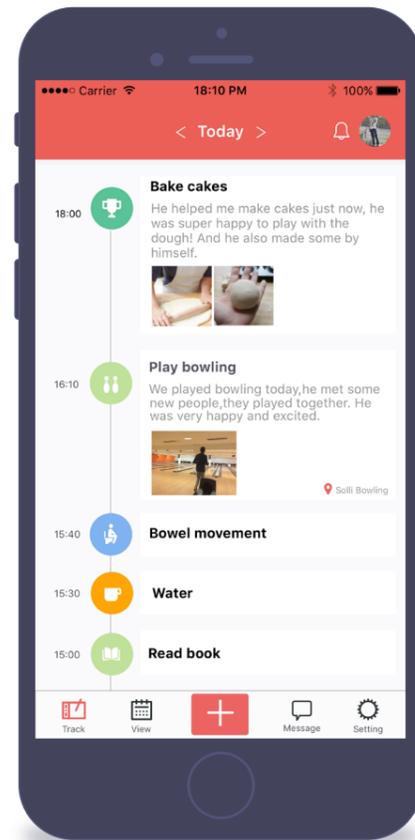


Recording

All the stakeholders can get access and contribute to this platform at anytime.

On a given day, an autistic child may be at home until 9am; parents will record the details of the morning. When the child is at school or the activity centre, the teacher or caregiver can have access to the morning details via the Know Me platform. They can also record details of the afternoon. Meanwhile, parents can access the app to monitor their child's notes during the day.

There are six types of information will be recorded. You can get into different recording pages by tapping different categories. The information is entered in a simple, easily understood format.



Timeline

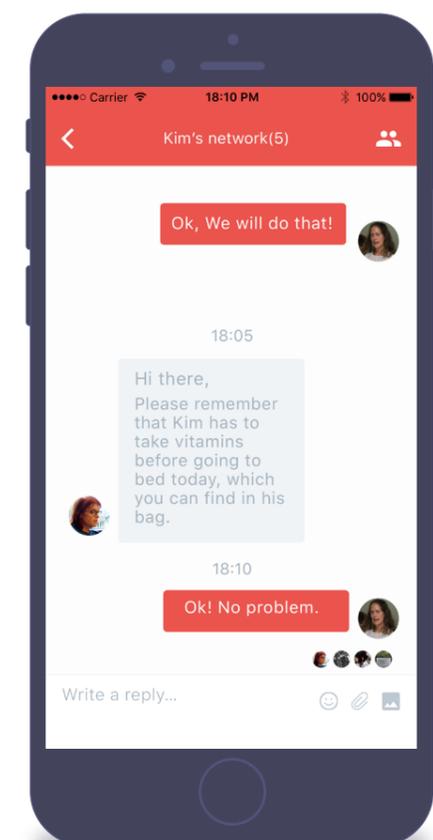
The timeline is the homepage for this platform (phone). All the recorded events will be displayed in the timeline. I put the newest event on top so that the events are displayed in reverse chronological order. This allows users to have a clear view of the individual's current status. They don't have to scroll up to check. On the navigation bar, you can change the date to check the situation of different time.

The events and the time will be showed in the timeline. Note, picture and location will also be showed if recorded.



Overview

This page gives stakeholders a general overview of the daily situation of the person by different categories. They can easily see that how many time he/she went to the toilet, what kind of behaviours the person had today, and what kind of activities he/she did and how long.

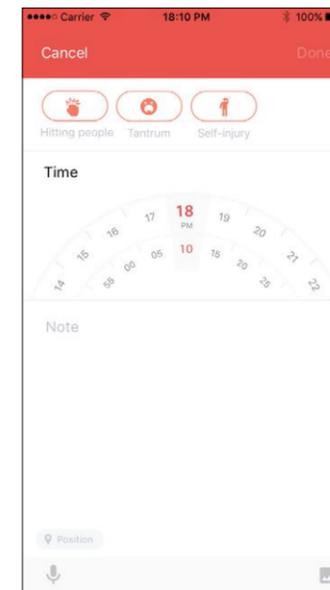
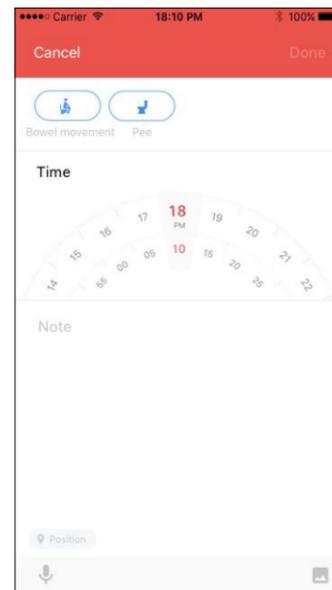
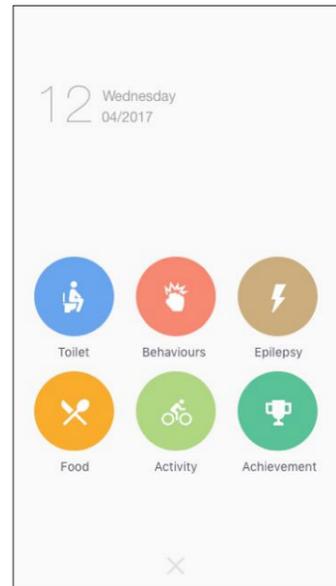


Message

This platform also enables communication between stakeholders.

Under the "Messages" application, stakeholders can write to each other if there is an emergency, or anything pertinent to be discussed. There is an option to receive a notification when a new message has been delivered to the group. Stakeholders can also see whether or not their messages have been read by each of the other users.

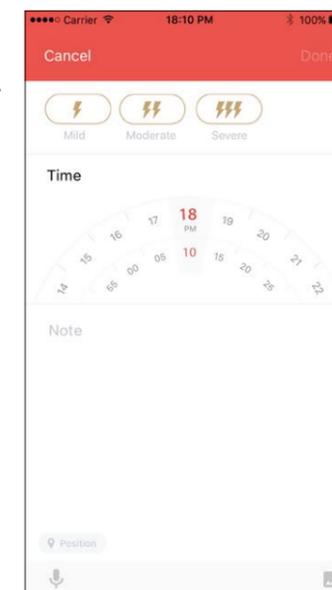
Recording



Behaviour

There are three sub-categories of behaviour that can be recorded: hitting others, tantrum, self-injury. These are the main behaviours exhibited by autistic individuals.

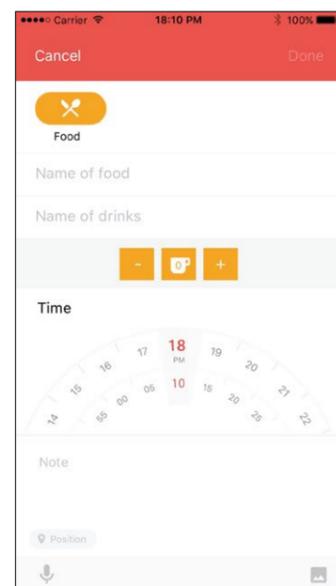
Different behaviours may represent different meanings. Recording behaviour is an important way to analyze the individual's current state.



Epilepsy

Distinguishing between seizure types is important since different types of seizure may have different causes, outcomes and treatments.

Since There are lots of types of seizures, I classified the seizures in three categories according to its degree, which is a easy way for people to understand and follow up.



Toilet

Recording details on bladder and bowel movements are very important for stakeholders. The information will be recorded by choosing one category(poop/pee) and setting the time.

Stakeholders may also add a note with a detailed description. This is a useful way to exchange information. For example, if the autistic child has had diarrhea, all stakeholders can be made aware.

Food

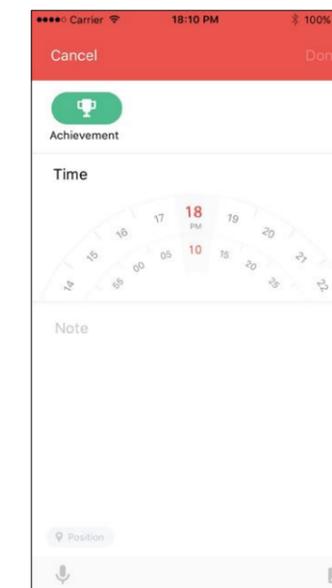
You can record the food and drinks at one time since people normally drink and eat together when they have a meal. But you can only record drinks or food as well.

Time can be set in the dial to describe when the person eats/drinks. You may also add some note to describe how much he/she ate, how is the food today,etc. Pictures can also be shared to show what the individual has eaten or drunk.



Activity

Stakeholders want to know what the person has done to get an overview of his/her day which helps them to have a better understanding of the person. Activity could be recorded by setting the time of the duration for the activity, writing notes and taking pictures.



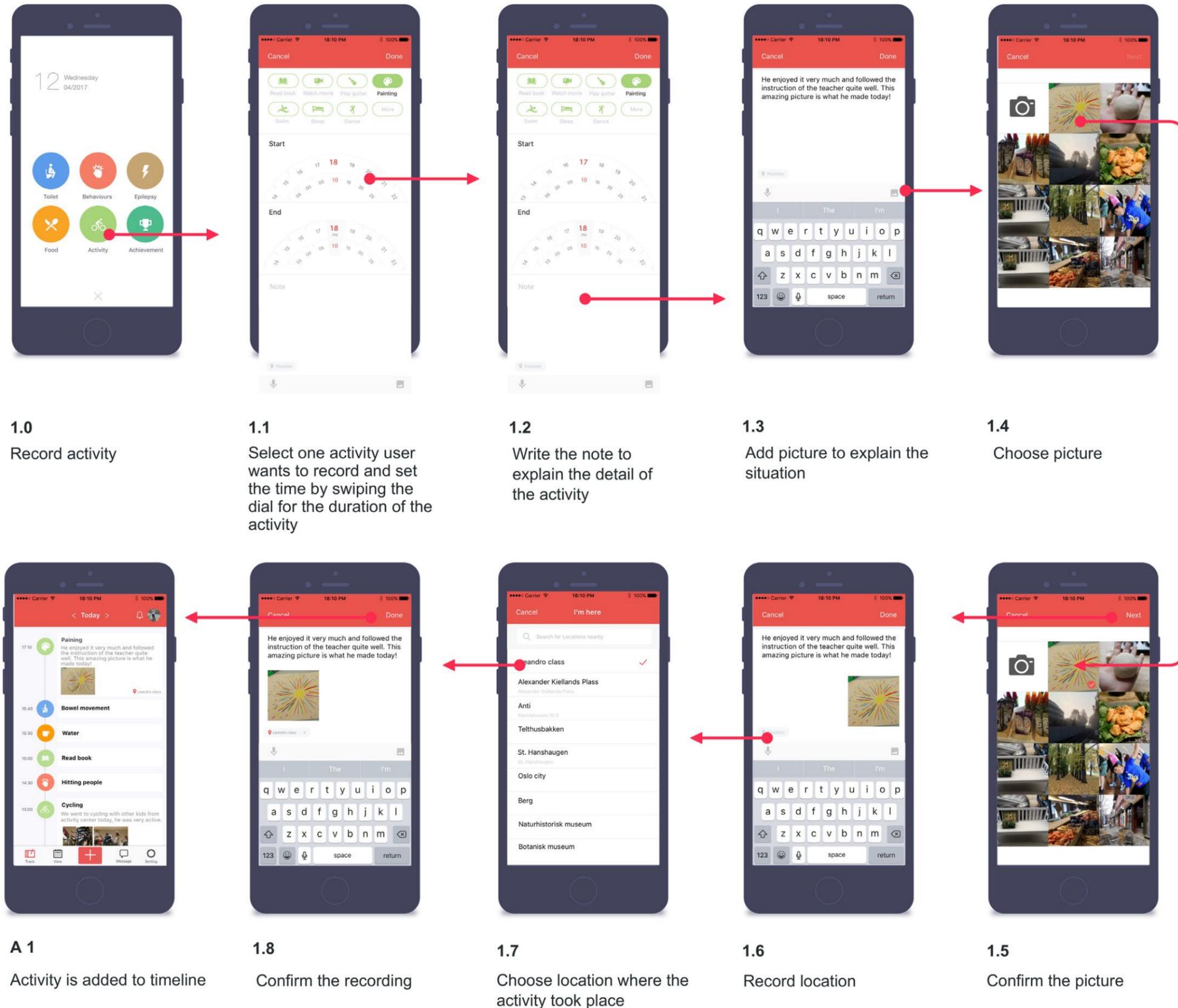
Achievements

Parents are always happy to see their child's achievements. Achievements can be recorded on the app by writing a note or taking pictures.

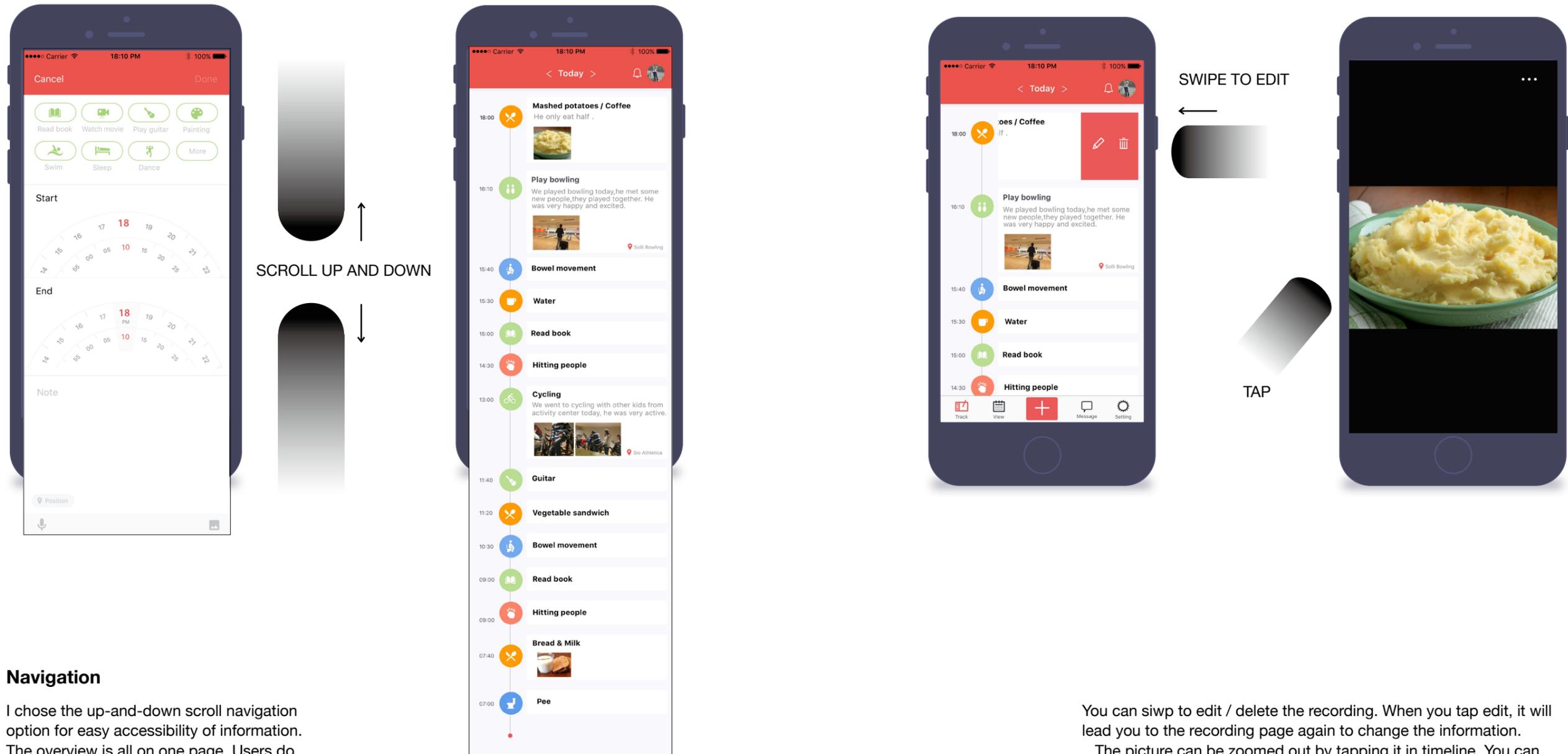
User flow of recording

I will explain the user flow of recording by showing one category.

The user flow of platform for phone will be showed in **MAP 1**.



Technical



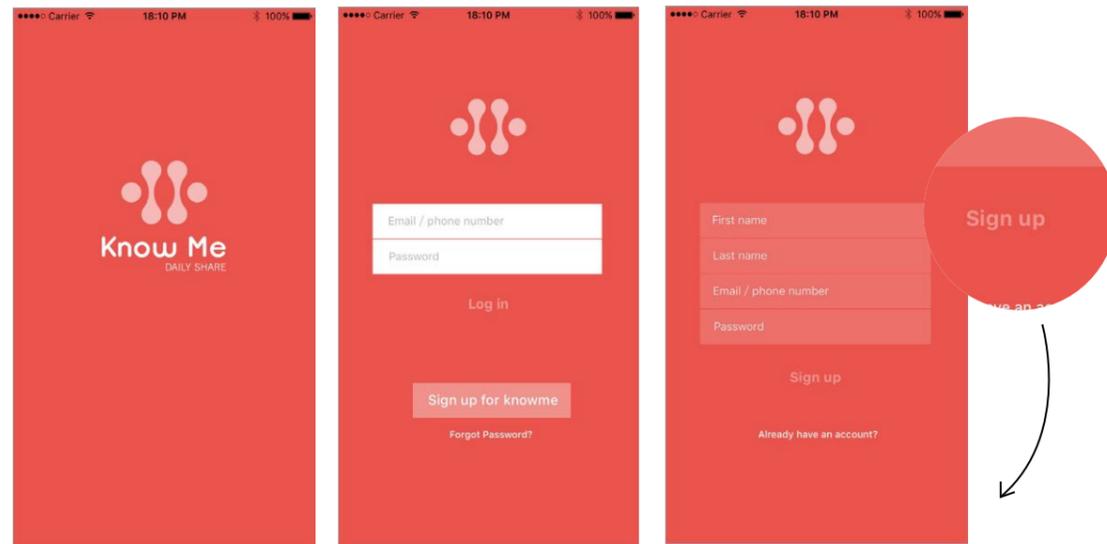
Navigation

I chose the up-and-down scroll navigation option for easy accessibility of information. The overview is all on one page. Users do not need to click back and forth between pages. When tested on users, it was clear that this function allows for more natural navigation.

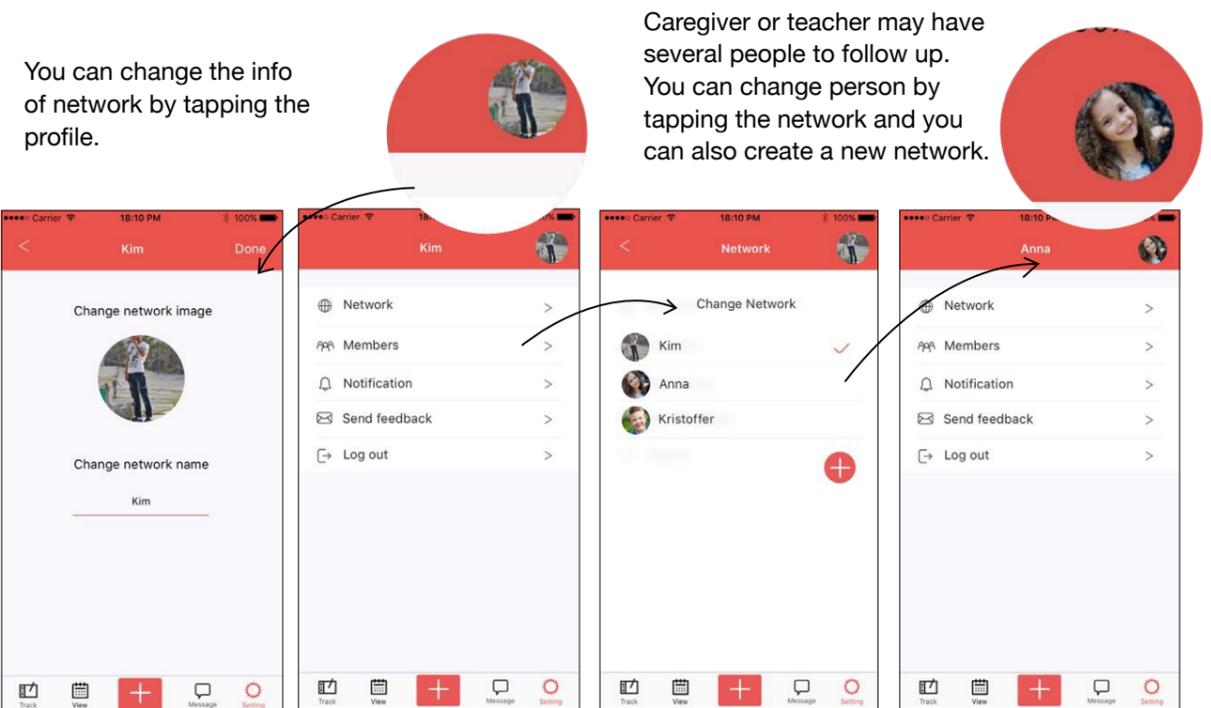
You can swiwp to edit / delete the recording. When you tap edit, it will lead you to the recording page again to change the information.

The picture can be zoomed out by tapping it in timeline. You can also save it to your phone.

Log in

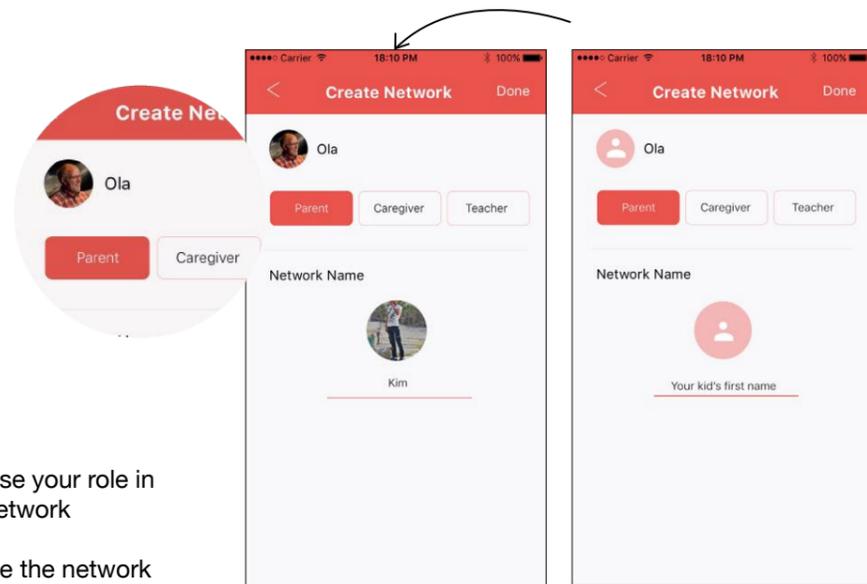


Setting



Choose your role in the network

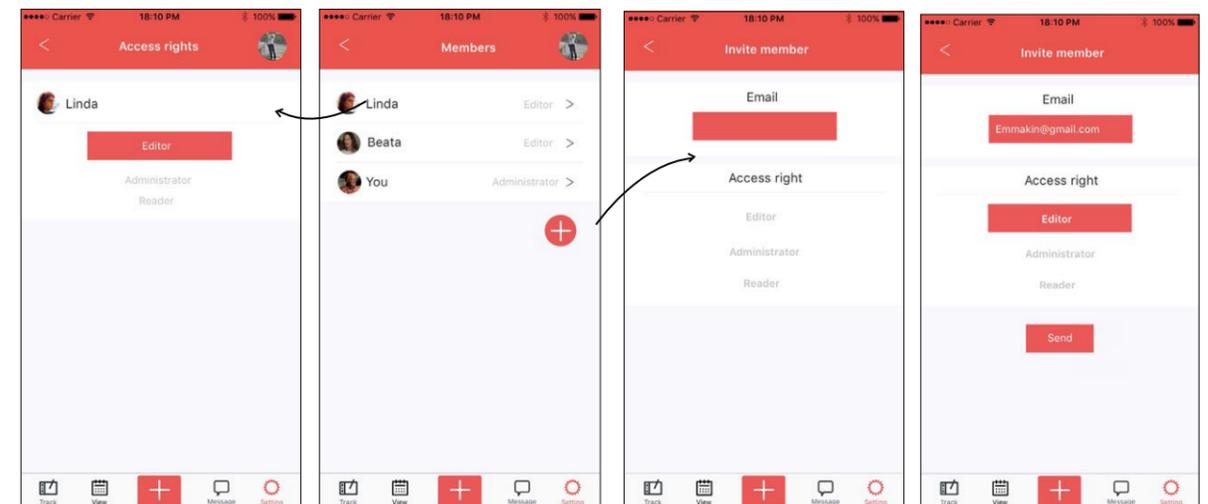
Create the network name and photo



After you sign up you can start to create your network.

You can see the members who are in the network and change their access right.

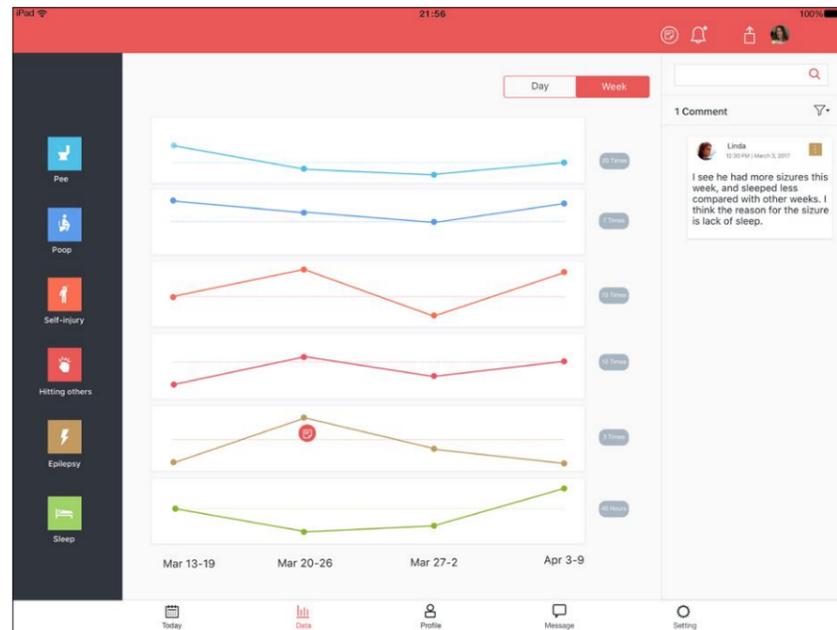
You can also invite core stakeholders to the network by email and give them different access rights as editor or reader.





Tablet -Data analysis

As discussed under version 3, the data analysis and general information functions are well designed for the tablet version of the app. The daily data and general information will be summarized and updated. This summary analysis can be used to inform any plans or decisions made concerning the autistic person.

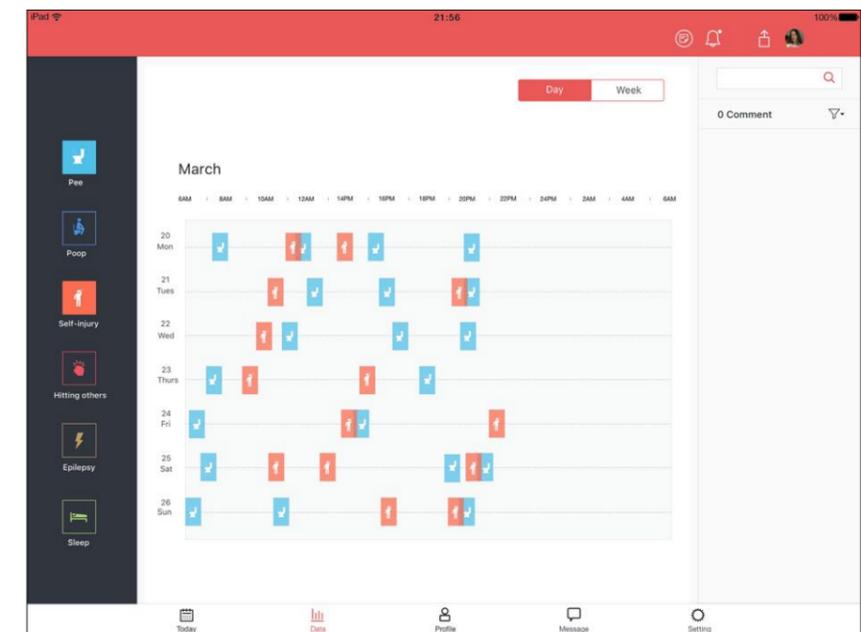
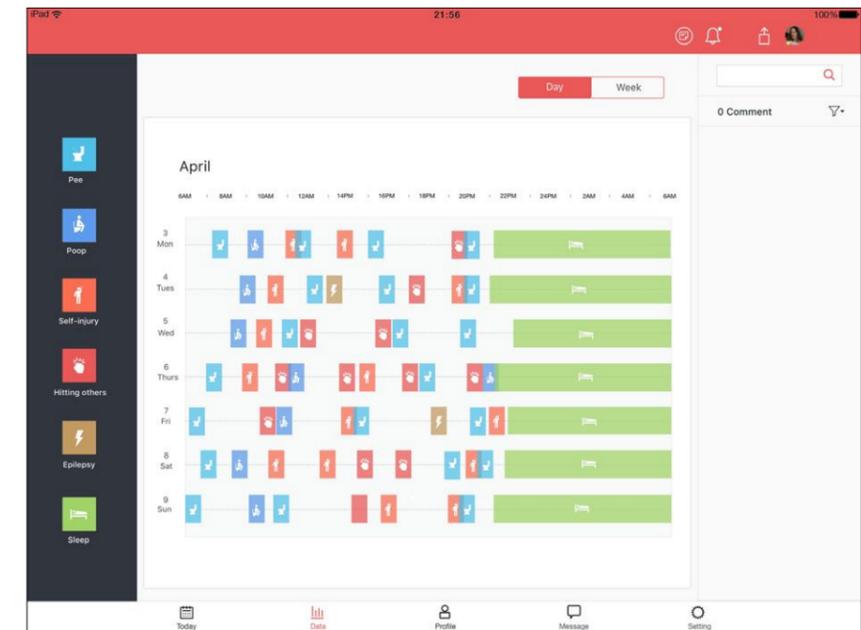


Week view

Different categories will be displayed on the left navigation bar. The categories to be displayed can be chosen in the app settings. Users can compare the data between categories and leave comments for other stakeholders.

The platform will summed up all the data, and generate different curves. Users can swipe right or left to see the data from previous weeks.

The numbers in rectangles on the right represent the frequency of different events. The number for sleeping curve represents the quantity.



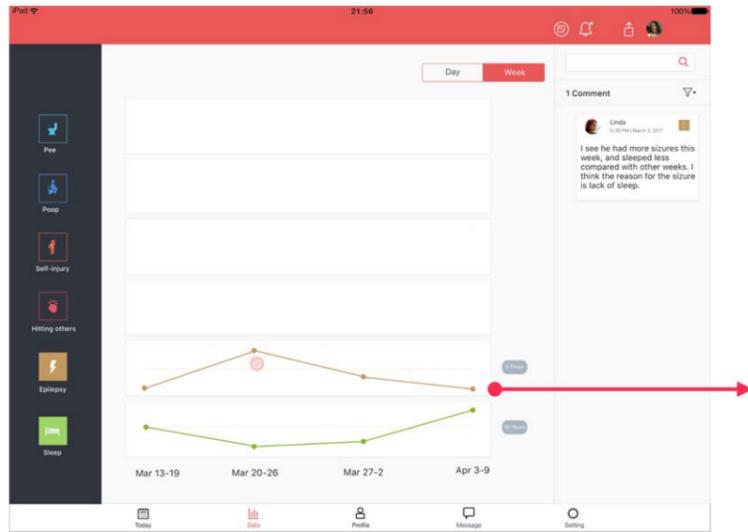
Day view

Week view gives user a general understanding of the person's development through the changing trends. Day view will also helps users to identify the patterns by showing a detailed view of daily events which were recorded.

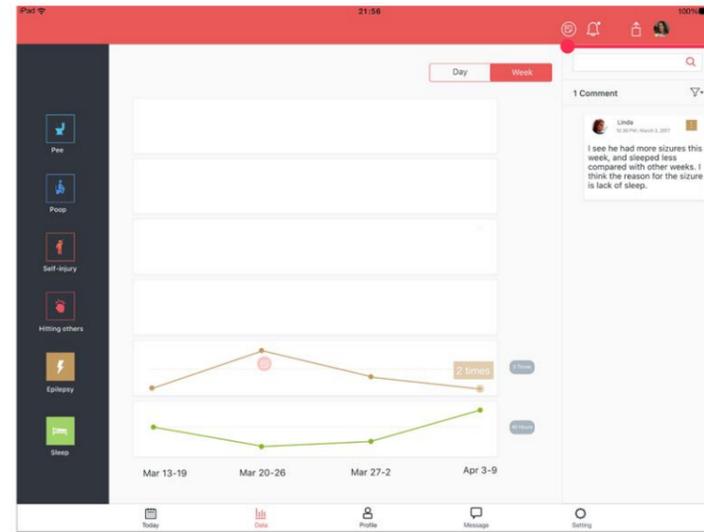
For instance, users can see when the autistic individual exhibits self-injuring behaviour, when seizures usually occur, or even get to know the causes by comparing different categories.

The user flow of adding comment

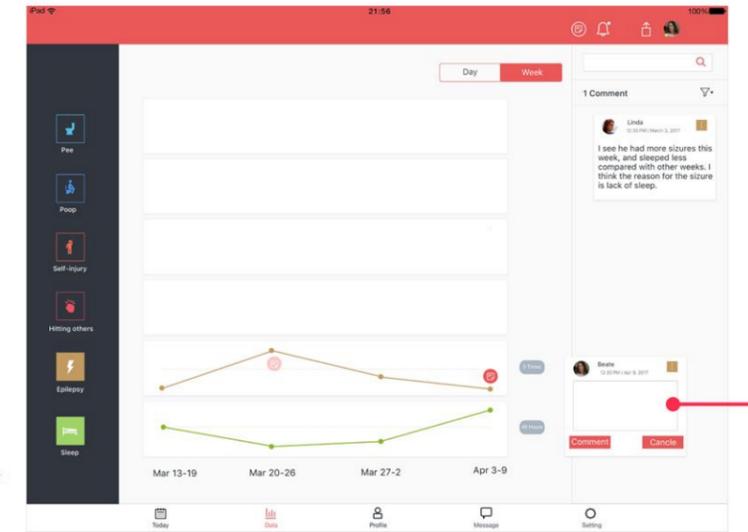
I will explain the user flow of adding comment.
 You can also see the video which shows how it works in my delivery.



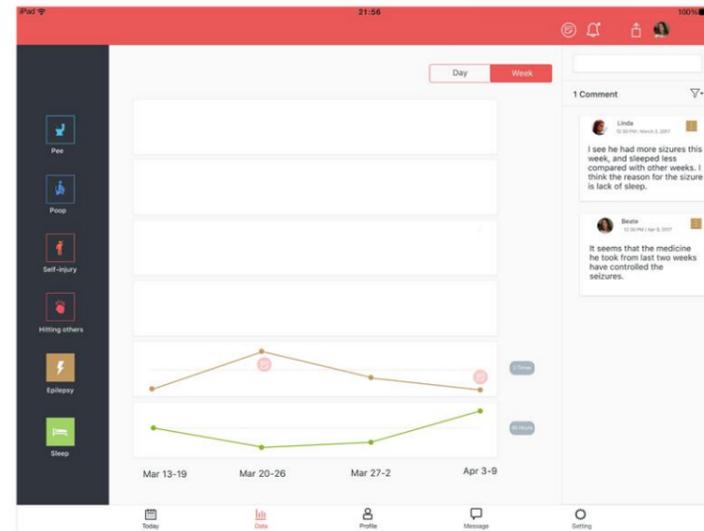
1.0
 View the changing trends of different categories which you have chosen (Here is the example: epilepsy and sleep)



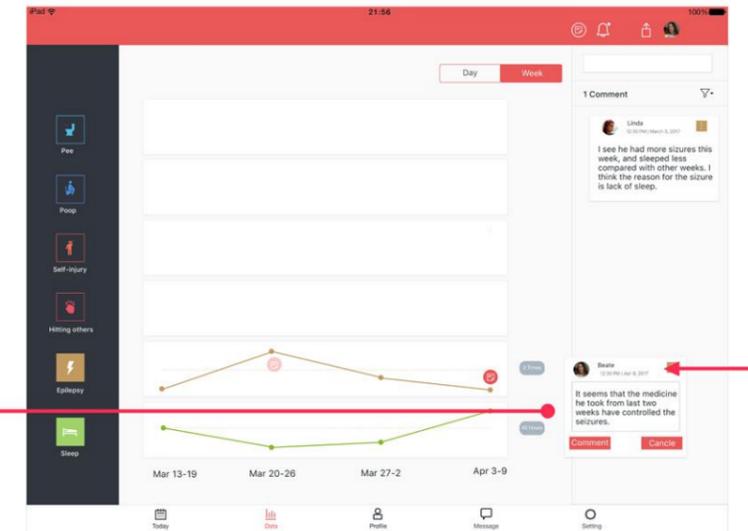
1.1
 Add comment when you get some interesting insights through the comparison.



1.2
 Write comment



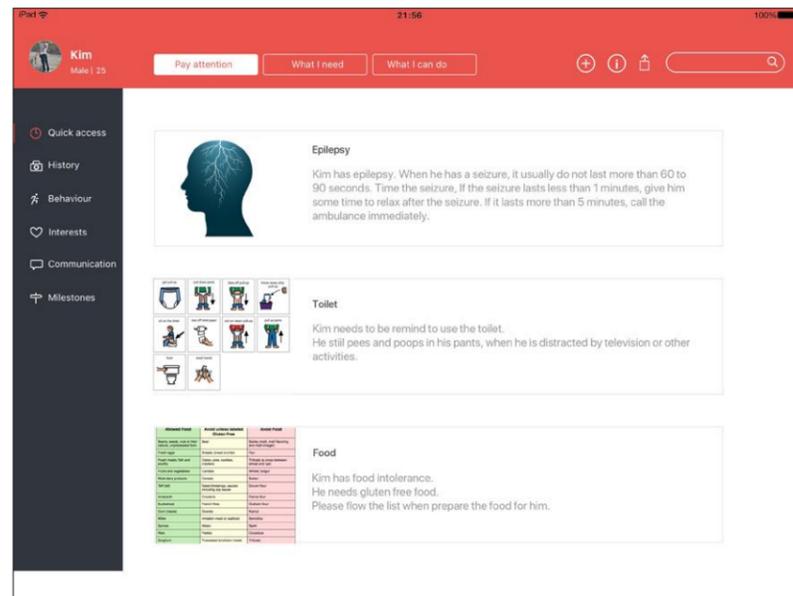
1.4
 Comment is added



1.3
 Confirm the comment

General information

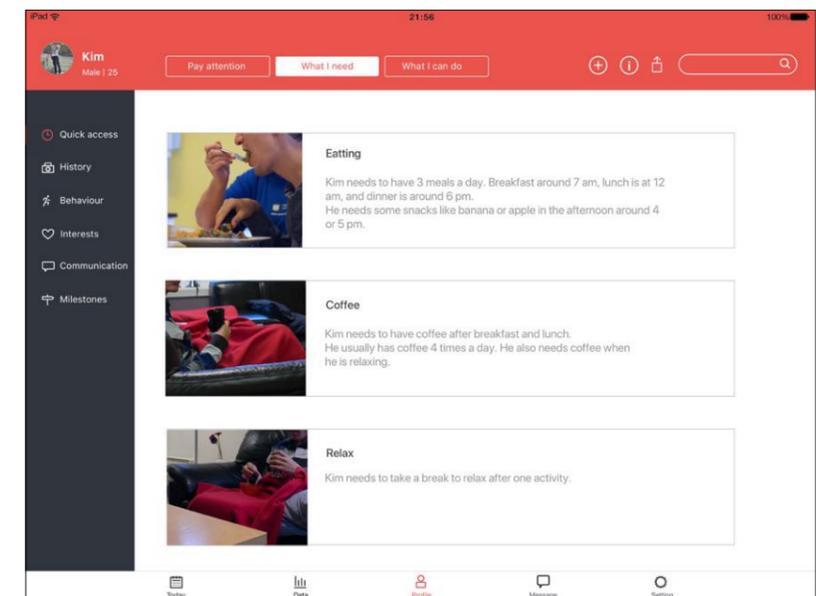
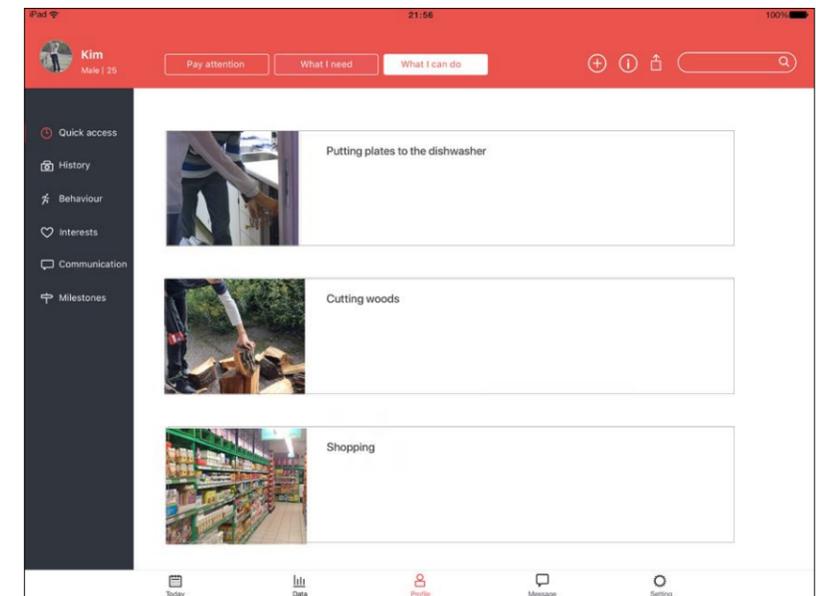
The general information about the person helps tell stakeholders who the person is to get a common understanding of him/her. It is also a platform for sharing experiences and knowledge about the person by building the profile collectively. It would also be used to transfer competency to new arenas and new people.



Categories

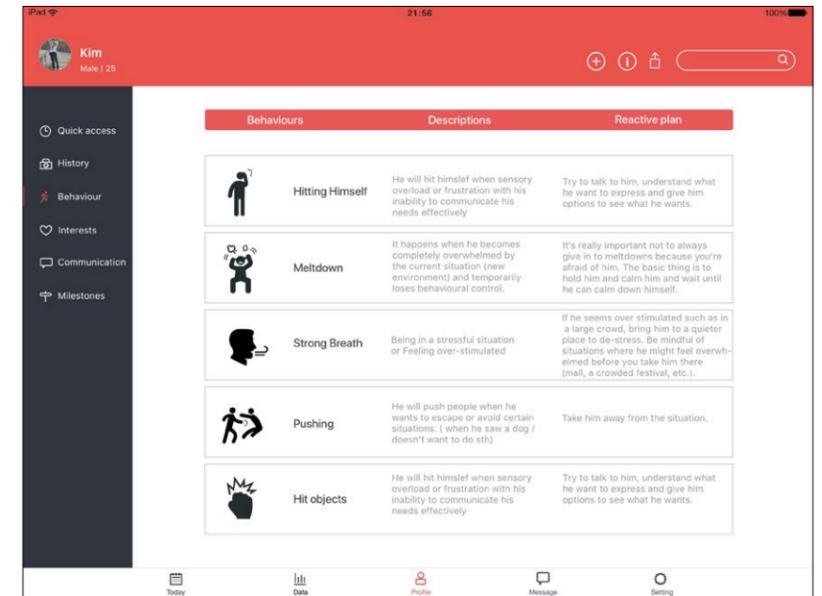
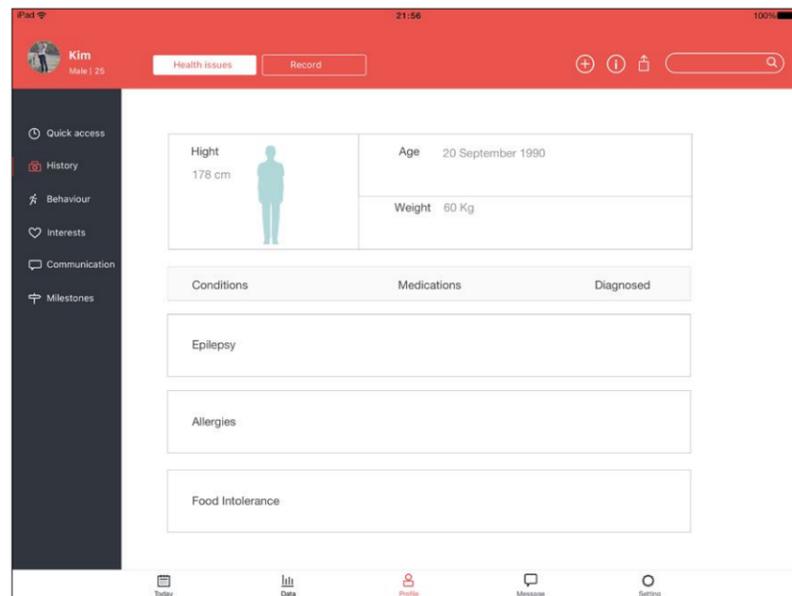
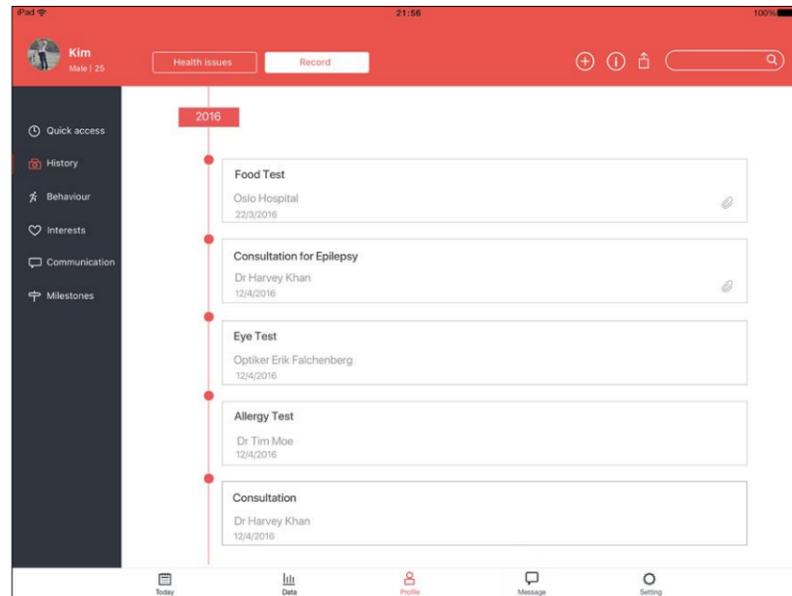
There could be different kinds of information related to the person with autism. How this information is sorted is important. It depends on what information the stakeholder wants, and when and how they use it. Therefore, I classified the information into six groups: quick access, history, behaviour, interests, communication, and milestones.

In Norway, the caregivers changes a lot, and there are lots of people working part-time without too much knowledge about autism. The quick access is for new people who just come in as caregivers, and need to know the autistic individual's need, ability, and tips for taking care of him or her.



I use the information of Adrian as an example to show how it will look like.

Picture and text would be used together to give users a vivid understanding of the content.



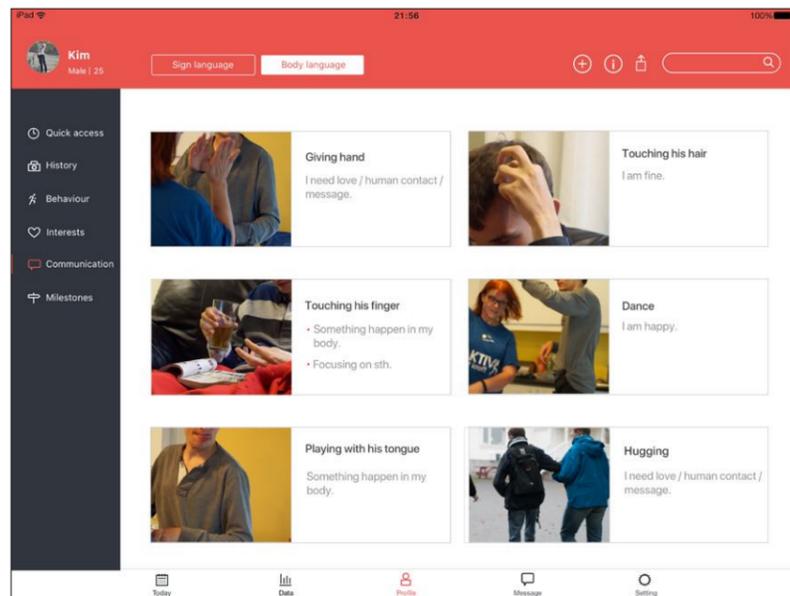
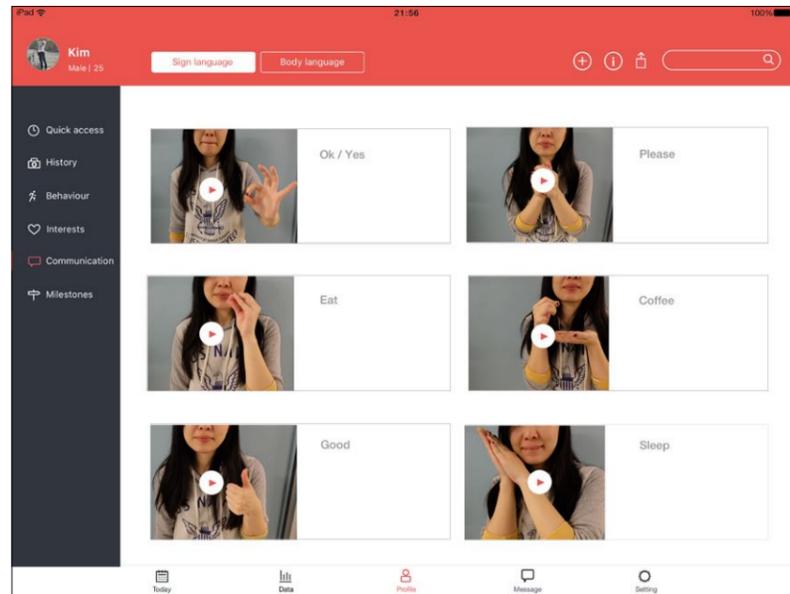
Behaviour

Different caregivers may have different strategies to manage the challenging behaviours exhibited by the autistic individual.

It would be helpful if all the people have a common understanding of the meaning of his/her behaviours and the strategies for managing the behaviour by sharing knowledge and experiences.

Health

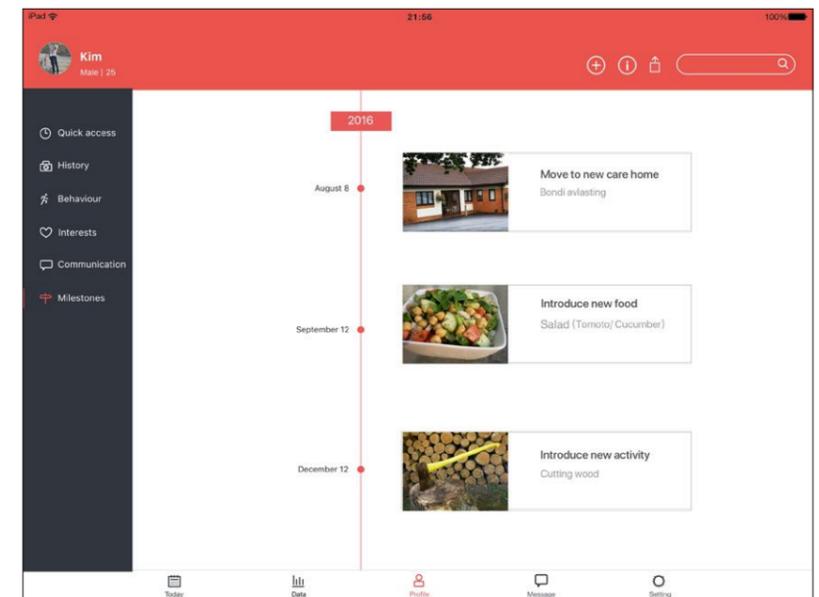
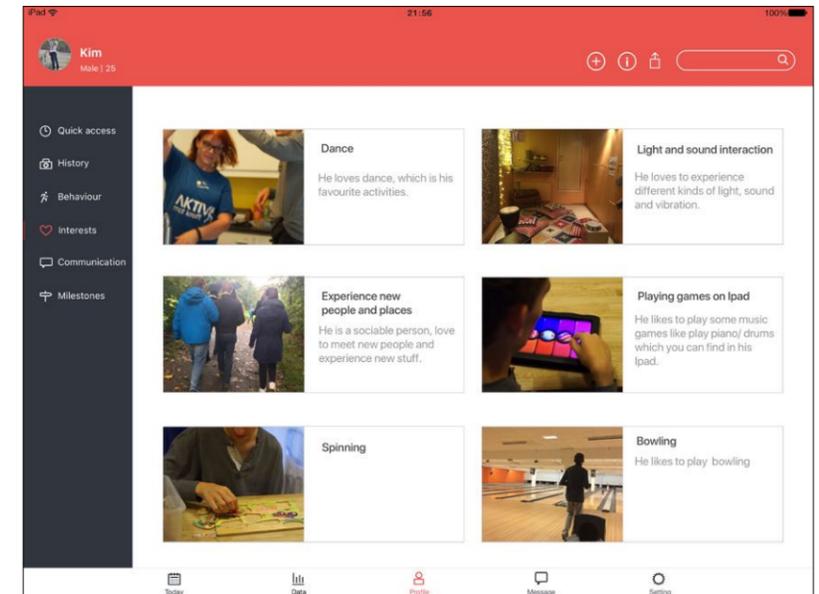
Autism apparently isn't a stand-alone disorder, with new research revealing that adults with autism often face a host of mental and physical illnesses. So Health information would be the necessary for all stakeholders to know.



Communication

People with autism usually have communication disability. They often communicate through gestures, body language and facial expressions which have different meanings.

Most of them use some gestures created by themselves, only the people who know them can understand. So I use videos to explain the sign language instead of picture which is a more understandable way.

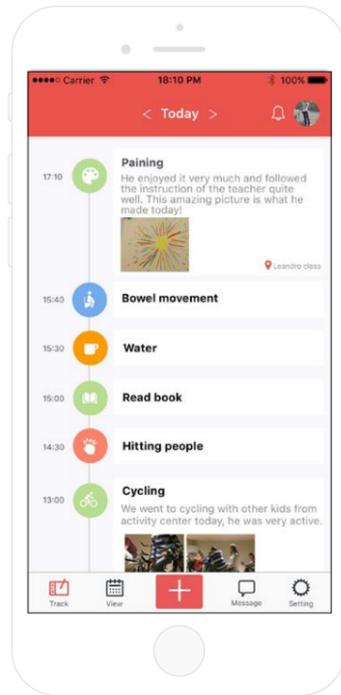


Interests

Autistic people often have special interests, which are highly important and meaningful to them, similar to an intense hobby. They provide a source of recreation, allow the child to develop competence in a certain area. By knowing his/her interests, stakeholder can have a better understanding of him and may also find ways to encourage the interests, which would be the traits that may lead them to become highly successful in the workforce if they can find a job relating to the field.

It also enables stakeholders to record all important notable milestones of the person's life which give them an overview of the development of the person's life.

Graphic details

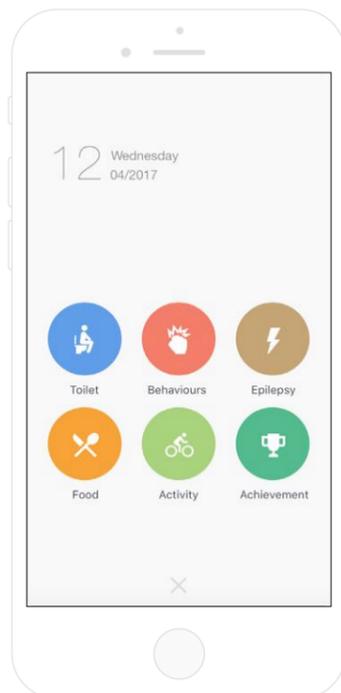


Font

The purpose of the phone app is the recording function. Stakeholders need to record the situation quickly, so there should be not excessive text to be read. The font should be easy to recognize to help them distinguish different categories and notes. For tablet, there are two main functions, data analysis and general information which are mostly like a database has lots of text they may need to read through. So the font needs to be both easy to recognize and read.

And the user group for this platform is mainly middle ages between 30~50 years old. So the font should be not less than 14-point.

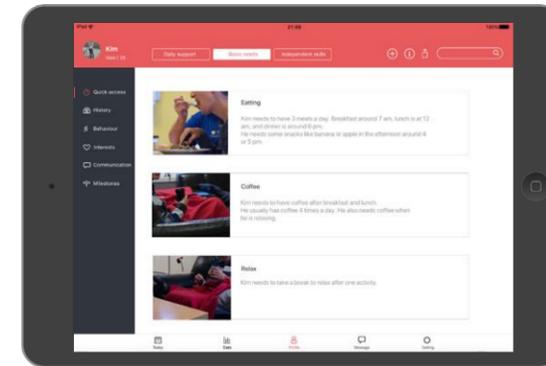
I choose the San Francisco (SF) font which is used by apple as the main font for the Apple. Because SF fonts are carefully designed to be easy to read in any text size and on any device, which meet the needs for this platform.



Color in categories



I am using different colours to represent the different categories which make them easily distinguishable. This example has six categories. I choose blue for the toilet which is associated with health. Red for behaviours which means danger and aggression. Orange for food which means energy. Green for activity which creates a sense of fun. Dark green for achievement, because it is commonly associated with progress and growth.



- Caring
- Trusted
- Convenient

Colors

I created some moodboards to choose the main colors for the design solution. Since it is a network platform to support autistic people, I wanted to make it more thoughtful, caring and trusted, but not medical and technical. Red color would be the ideal color which is associated with meaning of love, care, and desire.



Logo

The shape of the logo represents two people together, to show that stakeholders are closely connected to the autistic individuals. It also means data which is the main function of this platform.

Final Test



Feedback from two caregivers in Engløkka

"It is great you only take few seconds to record event in a simple way."

This is the feedback from Katrine and Beate, caregivers from Engløkka

One caregiver said the recording is quite easy to use, it looks like the app she is using now, she almost doesn't have to learn.

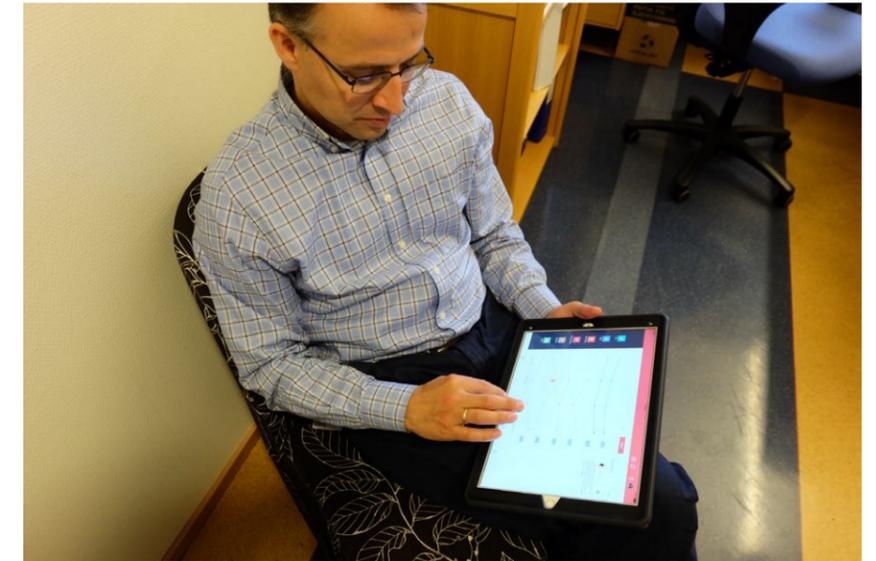
They said it is great. You only take few seconds to record event in a simple way.

It is nice that you can talk and share info and knowledge with each other directly in the message group.

When new caregiver come in, you can just give her this ipad to have a understanding of the kid she will support, which is great.

They said they have never seen this kind of tool to track data in this way which is exactly what they want.

The general information would be really helpful for new people.



Feedback from coordinator

"This app is really functional, which in an easy way to get an overview of his situation, and the development of his health and behaviours."

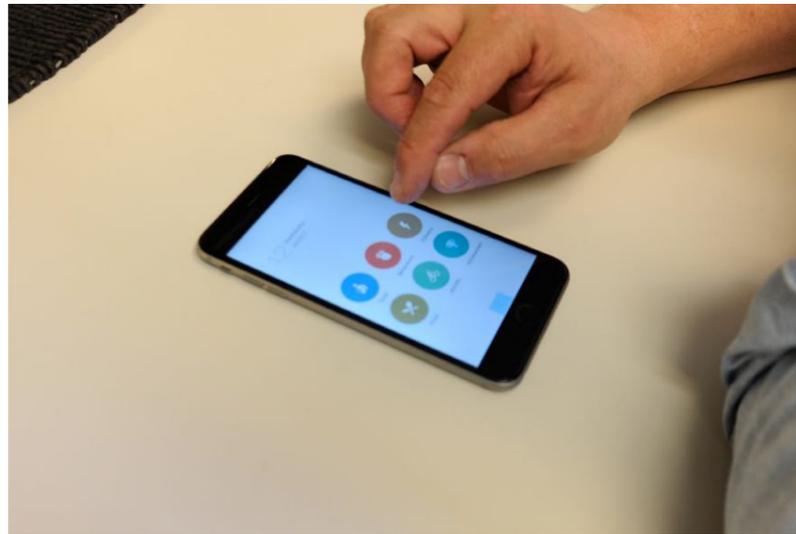
This is the feedback from Per Christan, the coordinator from Asker municipality.

The data analysis would help parents go back to see if he is getting better or worse, which is a great way to understand the kid.

The way to register an event is simple. It is similar to the apps that are commonly used now, which makes it very easy to learn.

If we have this app, we don't have to sit down to talk about the situation of the kid every month, all the things are summed up in this app. It makes everything much more easier.

This tool would not only be used for autistic people, but also people with neurodevelopmental disorders, like Down's Syndrome, who have communication disabilities and self-care disabilities.



Feedback from parent

"Now we can know what seems to be working, and what's not."

I tested the final version with two fathers of kid with autism. They both gave very positive feedback.

It is wonderful that you can just log in to get an overview of his day!

This app gives you a way to talk with your child about his day.

The application allows an event to be recorded in a structured way.

This app would be a very useful tool for sharing, recording and analysis of his activities, progress and behavior between the arenas.

We can get to know if he is getting better or worse recently from the data. It is exactly what we need.



Prototype

See the video (phone & tablet) in my delivery.

6. Conclusion

I will present the conclusion and the future potencial for this project.

Project conclusion

The main goal of this project is to improve the lives of individuals with autism and people around them. I started with investigating the overarching system, which was very broad, and then narrowed down to the specific topic of collaboration. Through my design process and methods I developed the digital service Know Me. When looking back to where I started I think I have done what I set out to do. The constant framing and scoping throughout the project have been key moving forward when starting so broad as I did.

User need

As the user said, there are lots of platforms which have different functions, but most of functions are not important for them. So I want to meet the target user needs by providing a service which is concrete and practical that makes the collaboration more efficient and meaningful.

System impact

Looking at it from a broader perspective, This platform not only represents a new relationship between stakeholders, also between autistic people and stakeholders. A relationship that empowers the collaboration more efficient and meaningful to help the stakeholders do their best jobs. It also gives autistic people a way to get others to understand them, which would make their life easier and better. The short term effect of this is stakeholders can have a better understanding of the person. For long term effect, this will benefit most of actors within the system, like doctors, coordinators, and PPT. They can make better decisions or suggestions for improvements of the person based on the how the main stakeholders know this person.

Possible future versions of this platform

The Menu-Tablet

Since I made two versions for this platform and the time is limited, I took most of my time to focus on the recording version, trying to make recording function as easy as possible to meet the needs of users. So for tablet version, there are lots of details should be redesigned for future versions. For example, the setting and the menu of the profile.

Set category

In the data analysis, different categories will be shown on the left navigation bar. There may be lots of categories recorded on the phone, but the user may not want to analyze all of them. There should be an option for users to choose what categories will be analyzed.



Search

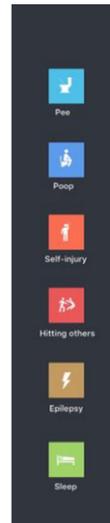
Sometimes user may need to find some specific information on the general information function. A search function should be available to help them find what they want quickly.

Data analysis & General information

The data analysis and general information functions are used on the tablet. It is like a database of information on the autistic individual for users to follow up on developments. Actually, I think it would be more interactive and intelligent in the future. All the data will be stored in PC, instead of tablet, stakeholders may not need to check the data and find the pattern by themselves. The system will analyze the data, display the insights, and offer suggestions for adjustments.

Planning

Through the user testing with parents I saw that planning is also a big need for parents. They said after they get useful insights from the data analysis or daily recording, they may want to make plans / adjustments for his kid which is a very important step to improve the quality of life of the kid. So in the future design, a planning function or platform should be available for the stakeholders to set goals and plan the lives for the kid together.



Design for individuals with other neurodevelopmental disorders

During the research, I find out that collaboration is not only a big challenge for people support individuals with autism, but also for people support individuals with other neurodevelopmental disorders, who have communication and self-care disabilities. They need high level of support with most aspects in their daily life from people around them, and the notebook is the main way to communicate and collaborate. I met a father of a child with Down's Syndrome, I found out that he had the same needs as the parents of people with autism. The caregiver also mentioned this platform will not only benefit for people with autism, also for people with Down's Syndrome. It is great to know that this platform has a big potential.

But this is only a four month project, and I have limited knowledge of Down's Syndrome. I think it would be wise to focus on one area which I familiar with. If I have more time, I hope I could do more research about Down Syndrome or other neurodevelopmental disorders to make this platform benefit more people.

Promote the project

To promote the project, Frode, Adrian's father, recommended that I must have a section with NAV to show this project, since NAV is also responsible for providing main stream solutions for people with autism and my platform have a great potential.

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Thanks everyone in Engløkka and Bondi avlastning who contributed to my research. This includes the experts I interviewed and the people who participated in interviews, workshop, and testing. Their creative ideas inspired my project in numerous ways.

Finally, I would like to thank my friends and fellow students who give me a lot of support and helped me to stay motivated throughout all obstacles.

