

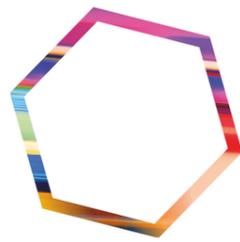
PROJECT 1 | SMARTTO TOUCH

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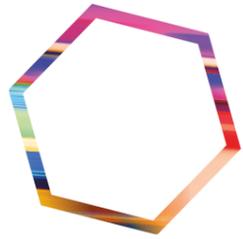


INDEX

1. INTRODUCTION	4
- TO THE PROJECT AND THE GOAL	
- PROJECT GOAL	
2. IDEATION	5
- WEEK 1 & 2 PRESSURE COOKER AND MORE IDEATION	
- WEEK 3 IDEA SELECTION	
3. CONCEPTUALISATION	8
- WEEK 4 EXPLORING TARGET GROUP AND PROTOTYPING	
- WEEK 5 FINALIZING THE CONCEPT	
- WEEK 6 PREPARING FOR THE MIDTERM DEMO DAY	
4. FEEDBACK	13
5. INTERIM FUTURE GOALS	14
6. VALIDATION I	15
- WEEK 1 & 2 REFLECTING ON CONCEPT AND USERTESTING	
7. REALISATION	17
- WEEK 3 PLANNING AND EXECUTION	
- WEEK 4 IDEA FOR USERTEST AND EXECUTION	
- WEEK 5 & 6 REALIZATION AND SETTING UP USERTEST	
8. VALIDATION II	23
- WEEK 7 USER TESTING	
9. BRAND IDENTITY	24
10. FUTURE GOALS	26
11. REFLECTIONS	29
- REFLECTION ON OUR INTERIM FUTURE GOALS	
- PAUL ROELEN	
- JEF ROUSCHOP	
- LENA OPHEIJ	
- VERA TAK	

12. APPENDIX	34
-SWOT ANALYSIS	
- QUESTIONNAIRE 1	
- QUESTIONNAIRE 2	
- CONCENT FORM	
- CONTRIBUTION OF TASKS	

13. REFERENCES	39
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INTRODUCTION

TO THE PROJECT AND THE GOAL

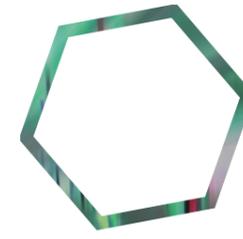
A world without traveling is hard to imagine for most people. Whether you take the train or ride the bus, there are countless people traveling alongside of you. Every day, for the greater part of the year.

When walking through a train, most travelers share this aspect: they are sitting next to individuals who are unknown to them. They are not talking or even attempting to for that matter. There is hardly any social contact between people in public transportation. Why are travelers so isolated? Because they isolate themselves. There is one other similar detail that can be noticed: most of them listen to music. A figurative wall of music separates them from other travelers, even those right next to them. A third similarity between travelers is that hardly any of them even like traveling. They see it as wasted time; time that could have been spent on something else.

We do not see the journey as wasted time. We see it as a wasted opportunity: an opportunity for travelers to make their journey better through interaction. In this project, with the theme of 'Smart to Touch', we will be looking at ways to bring this opportunity under attention of travelers through our concept Hapto. In this report, you will read extensively about the process our concept went through and the research we have done.

PROJECT GOAL

With our project we want to enhance social contact between travelers through music. Our concept Hapto can be used by people with all ages, as long as they are seeking for social contact. Hapto gives people a fun traveling experience by giving meaningful conversations, meeting new people and exploring new music.



IDEATION

WEEK 1 & 2 PRESSURE COOKER AND MORE IDEATION

The start of our 'Smart to touch' project was all about a very rapid iteration of the design cycle, called the pressure cooker. The intention is that you generate ideas, choose one and continue to work that idea out as detailed as possible in the given (short amount of) time. In this case, two weeks were given to work out the idea. The design case was to design something that is close to the user's body, and that the concept is 'smart to touch'

After a short introduction concerning the pressure cooker, we started idea generation. Initially, we struggled immensely with the openness of our design case. We tried to generate ideas through the following channels:

1. Brainstorming in general without any requirements
2. Searching for and thinking of environmental, societal and personal problems
3. Browsing do-it-yourself websites to try and find inspiration from already existing projects

We needed a direction. Looking at our problems again, there were a few recurring elements among them, like dementia. Though there were useful things we found in our previously collected problems, we wanted to put more thought into idea generation. So we set those elements aside, but still kept them in mind. We then listed mutual interests and researched subjects that fit very well with the requirements.

When people go for a run, they like to listen to music while they're running. It helps them to keep the right pace and to make running more entertaining. People often use earbuds or headphones to listen to music. There are three main inconveniences in this situation:

1. The cable of the earbuds gets in the way
2. The earbuds are 'one size fits all', but do not fit all people well, causing them to fall out
3. The interaction with the music is through the phone, mostly connected on people's upper arm, an inconvenient placement for a touchscreen.

The concept we worked out, the AMP Jacket, aims to amplify, to improve the music and running experience for runners by tackling these problems and implementing new ways of music listening.

The AMP Jacket is a wireless music system that is integrated into a sports jacket. The system connects with mobile phones through Bluetooth. The speakers are located around the collar and are directed to the ears. In this way listening to music while running will be less of a hassle. To enhance the running experience to the fullest, a vibration system will also be implemented in the jacket. They ought to stimulate as well as support the running pace of the user. To support the running speed even more the connected mobile phone will make a selection of songs that are in line with that running pace. Gesture sensors on the jacket makes sure that skipping/pausing/playing a song or turning up and down the volume is no problem.

Our prototype was made using an off-the-shelf training jacket and the speakers of a cheap headphone. We mounted those to the shoulders of the jacket and put cloth over them to make it look more refined as can be seen in figure 1 and 2. At that moment, a wired connection with a phone was necessary for music playback, but our goal is to make that wireless. The vibration system was also not yet implemented, as well as the gesture controls. But this prototype gave our peers and coaches the general idea of our concept.



Figure 1: Paul is sewing the sport-shirt.



Figure 2: The shoulder speaker.



Figure 3: Logo of our concept.

WEEK 3 IDEA SELECTION

This week we mainly focused on how music can connect people. At first there were some struggles, but we were given good advice by the coaches on how to brainstorm properly and effectively. They told us that we first had to brainstorm all by ourselves for the first 10-15 minutes without discussing your ideas with others and after this time we were able to discuss the ideas (figure 5) while keeping the golden five brainstorm rules in mind:

- Generate as many ideas as possible, as fast as you can
- Every idea is a good idea!
- Decision making comes later
- Be willing to be silly
- Mix it up (use several brainstorming techniques)

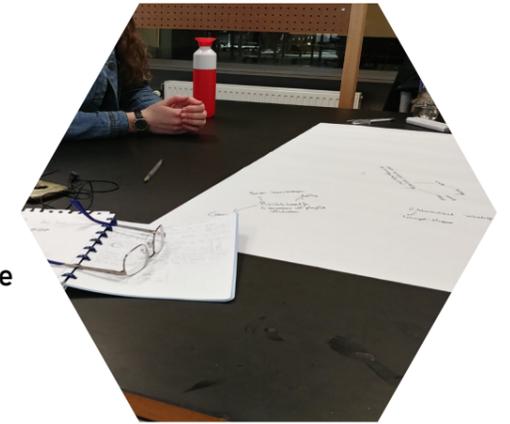


Figure 4: Brainstorming, write down every idea that pops into your mind.

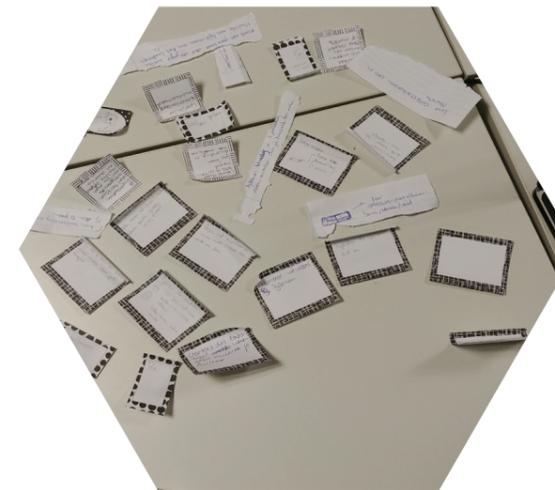
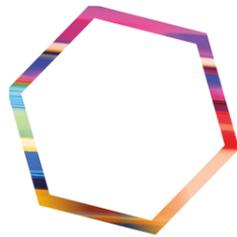


Figure 5: Clustering the various ideas through a mind-map.

The coaches also noticed that the common goal of the brainstorm session was not clear for everyone in the group. We were told to clearly identify what this project was about, who the target group is and what is important for this project. After these tips we noticed that idea generation was more efficient. At home we all thought of some more ideas which we then clustered in several categories. This way we could get a better overview. From this overview we came to the conclusion that it is very important for the people to have a choice to communicate and that the system should be easy and quick to use. We want to create a system that connects two people while they are listening to a similar kind of music. These two individuals both receive a signal that someone close in range is also listening to the same kind of music. We choose for close-range to limit the amount of time two people have to walk to get to each other. In this way the threshold is lowered.

One idea was making a sort of map with a five meter range on the device which included a 16-bit light grid to estimate where the person would sit. The 16-bit light grid could also be replaced by pins that move out of the device. This also agrees with the subject of Smart to Touch. At last we were mostly convinced by using a system similar to a compass. This won't show how far this certain person is sitting. However, this should not be a problem because the other person is also searching for you so in the end you will find each other on that close-range.

We considered the realisation of this device as well. By designing a device that can be put in between a phone and earbuds, it should be forgotten less easily. An added advantage is that personal headphones or earbuds can be used. This would then be used more as a 'dongle', so the device functions with help of the battery of a mobile phone. The device itself is able to notice other devices that are playing the same music. The device must be used in between your mobile phone and your earbuds. This way you will forget it less easy. We were also thinking about adding a splitter to our device so you can listen to the same music together and people could still use their own headphones or earbuds.



CONCEPTUALISATION

WEEK 4 EXPLORING TARGET GROUP AND PROTOTYPING

We presented our concept, Hapto to the coaches. Hapto in Greek means to connect, and it is derived from haptic feedback. As feedback we got a few questions like: Will this concept actually stimulate people to communicate with each other? Do these people want to communicate at all? What is your target group? We wanted get more clarity on these questions by making a questionnaire and doing some literature research.

With the questionnaire we wanted to know more about the current behaviour and activities during traveling by public transport. We also asked about their social contact during these travels. The questionnaire showed us that indeed, almost everyone was listening to music during the journey. It became very clear as well that a lot of people do not have any contact with their fellow travelers and that they only are in contact with others when they have to.

During the literature research we found a very interesting paper worth mentioning. This paper stated that people do not have contact with strangers when the anxiety and uncertainty is too high. The anxiety is based from anticipation of negative consequences. The uncertainty comes from the fact that people are not able to predict the other person's behavior. This paper also stated that the uncertainty could be reduced when a person is able to predict the other person's behavior and when the person is able to empathize with the other person. So, a similar taste in music could reduce the uncertainty because you already know something about that person. When having a similar taste in music people are also more able to empathize with each other.



Figure 7: Prototyping shapes to decide the shape.

By making a clear concise pitch we wanted to make our concept easier to explain to others as well as rule out any irregularities in our individual vision for the concept. Another way to clarify our concept is by making a scenario sketch as can be seen in figure 6. This way the coaches could see clearly in what kind of situation the Hapto will be used.

At this point in the project we only had the Hapto in our head and on paper. There were many sketches and ideas on shapes of the device, but we also wanted to make physical prototypes that we can test on comfortability (see figure 7).

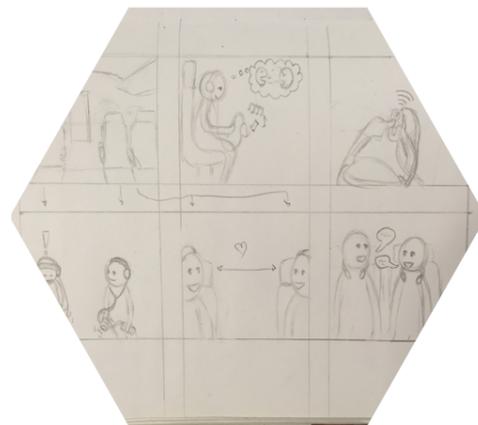


Figure 6: Sketching the scenario.

WEEK 5 FINALIZING THE CONCEPT

After the explorative activities of the previous weeks, it was time to be more specific regarding our concept; especially since the midterm demo day approaches quickly. A week before the demo day, there would be a pre-midterm demo day: a day on which we would practice the presentation of our concept the way we would on a real demo day. The goal of this day was to get as much feedback as possible before the actual demo day.

We reviewed the physical prototypes we made last week. Points of interest for reviewing these were the shape in the hand and the shape in pockets. The first point, we chose because the device will have a tactile compass on it; thus, people need to hold the device to feel direction; the shape in pockets is important, since the device will remain next to a phone in a pocket for most of the time. Some forms were very comfortable to hold in the hand. However, these were generally not very comfortable to wear in pockets next to people's phones and vice versa.

The relation between the shape and the comfortability in two situations is negative: raising one factor means lowering the other. We could have chosen between a balance between hand and pocket comfort. Yet we did not do this. The device will most probably reside in pockets or bags for most of the time. That is why we decided on a rectangular form factor with rounded edges: since it is longer than it is wide, it will fit nicely next to a phone in your pocket.

One valuable piece of feedback from our coaches on our design, was that it was not 'female-friendly'; in the sense that most female pants do not have pockets large enough for a phone, let alone a phone and this dongle. This led to the decision to add an elastic band to the dongle, that would connect the dongle directly to the phone. As added support, a part of the back of the dongle could swivel around 90 degrees. It provided support to the back of the phone, so that the elastic band would not suddenly snap off of the side of the phone.



Figure 8: Testing our shape prototypes.

The execution of the idea in a physical form was discussed as well. The device will include a compass. After brainstorming sessions, we decided on a mechanical mechanism that would communicate direction to users: the design has a circular fabric pad on top, under which eight small rods are placed in cylindrical holders, arranged in a circular pattern along the border of the pad. The rods can move up and down in their holders because of electromagnets. These push the fabric on top upwards, through which the user can feel the general direction another person is sitting. This idea came from the inspiration we gained at the Material Xperience, as seen in figure 11.

Another problem we tried to tackle, was the value proposition of our concept. The 'social interaction' that our design promotes to users, needs to be attractive. They need to see added value in our design. The question is: What does our product add to users' lives to push them into interacting with strangers? Initially, we thought the social contact users get through the concept would serve as enough value. Feedback from our coaches and the results from the questionnaire led us to believe that this is not true. In a way, it seems logical: people would not want to admit they are not social enough while traveling, since they would be admitting that they are doing something wrong. Social interaction alone is not enough value for users to use or buy our product.

Through brainstorming, we settled for a solution that we proposed in earlier weeks: exchanging songs via the device. This would add the aspect of music discovery into our concept. The added value of this feature would be that you can discover new music through talking to people. Moreover, the user has a lasting memory of the conversation. Another small value that our concept has for users is that it offers them a traditional audio input for their music playing device or phone. This is a value, because many modern phones do not include this input port anymore. With that in mind, the current overall value proposition is this: discovering new music is the stimulating factor for the actual goal, social interaction between strangers while traveling.



Figure 9: Our final prototype for the midterm demo day.

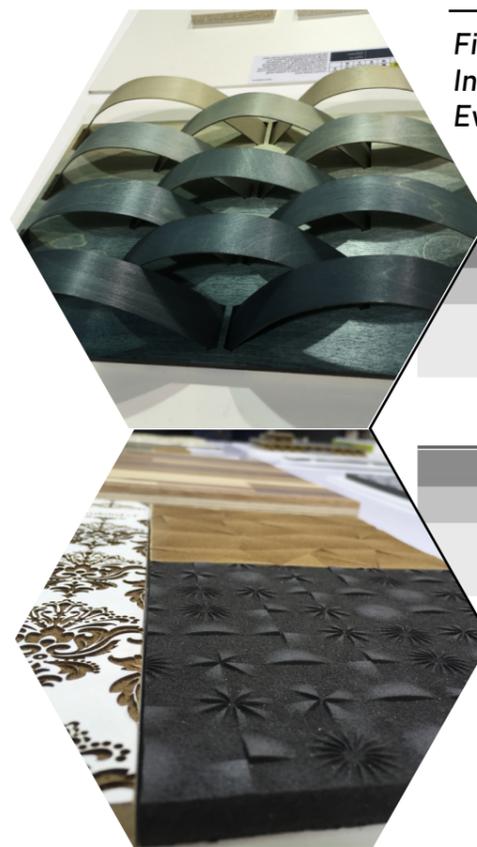


Figure 10: Material Xperience: Interactive Sensory Design from Evan James Design.

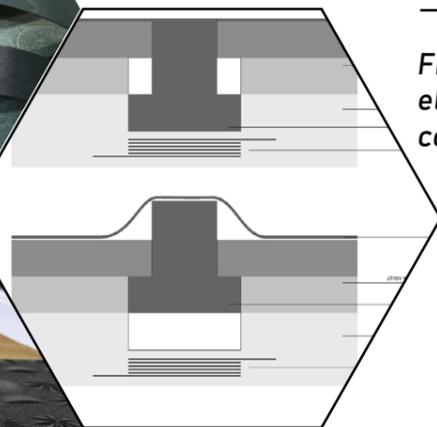


Figure 11: A system with electro-magnets functioning as a compass.

Figure 12: Material Xperience: Sublidot from Strasser AG Thun.

WEEK 6 PREPARING FOR THE MIDTERM DEMO DAY

We had a pre-'midterm demo day' which gave the experience of a real demo day. The most important feedback we received was about our concept. Based on this feedback and the features of our concept we conducted a SWOT analysis which can be seen in the appendix 1. This contained the strengths, weaknesses, opportunities and threats of the Hapto as it was. This way it became very clear where room of improvement was and what we wanted to keep in our concept.

First of all, we wanted to make the device wireless and more portable. All the functions such as building a music profile, finding other devices and connecting were moved to the mobile phone, which saves a lot of space. This also meant that an app had to be made. Furthermore the device now works parallel to an already existing listening system, which connects to Bluetooth. The mobile phone also traces the other device through bluetooth. The phone's internet provides a more accurate GPS. Since the device is now wireless, it does not have the mobile phone as a power supply. This should not be a problem, because the device does not use a lot of energy.

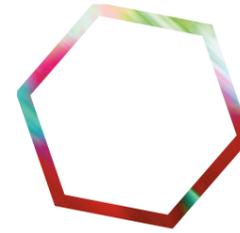
A Lo-Fi prototype was also made to present at the midterm demo day. At the Material Xperience we saw many products that were presented in such a way that made the function clear at first glance. This inspired us to keep the presentation visual and clear. A poster was made that contained three levels of depth. First we used keywords, then specific keywords and lastly a short text about the Hapto. See figure 12 for an impression of this visual set up.



Figure 12: Set up midterm demo day.

Figure 14: Photoshoot of our final Lo-Fi prototype.

Figure 13: Scenario in progress.



FEEDBACK



After the midterm demoday, we discussed all the received feedback that we wrote down. We made a few categories.

The feedback that fitted into our most important and urgent category was:

- Specify your target group/target use case.
- How are you going to find people 'with the same musical taste'?
- Through similar genres, artists or songs?
- Is the online/offline switch really necessary?

Some feedback can be used in a future marketing stage of our project. We want to put effort in a technical roadmap, a business plan, and a brand strategy. The following feedback we received during the midterm demoday can be applied to this stage:

- Think about how to market this product, like a free giveaway by the NS or at concerts.
- How much is the product influenced by fashion, can we make it a fashion statement?
- In this way people can show their own music style, and customize their product. People will use the haptic more than a couple of times in this way, because it gives something personal like a memory. The customizable parts can be made by everyone, also famous brands, which can be a business plan.

We have already spent some time on the details of the technical implementation, but we needed a push in the right direction. We also asked and received some technical feedback and opportunities, especially on the question 'How are we going to find people with the same musical taste?'

Possibilities problems and opportunities in this area are:

- Implement existing song libraries, like Spotify.
- How are we going to deal with privacy regulations for artists, for example by giving artists the choice of enabling this product to work with their music. Or put this in a Spotify contract
- How can the devices exchange songs, by NFC/RFID or bumping for example?
- Maybe vibrate more intense when someone is closer. So the closer someone gets to you, the stronger the haptic vibrates.

For future pitches or demodays, we have received some feedback as well. For the pitch we were advised to take on a more natural way of speaking. Also, to make more use of the attributes, the prototype and posters, we brought. For the poster we were advised to use less text. "Make people look at you, not the attributes you have brought."



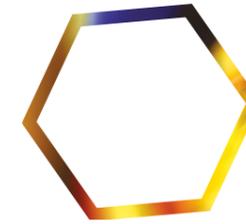
INTERIM FUTURE GOALS

We gained a lot of experience in the first half of the project. Along with the feedback we received we are going to start the second half of the project with new bright insights.

We want to implement these new insights in the rest of the project by setting some goals for the future. We discussed the feedback and we tried to find solutions for the problems and make use of the opportunities that were given to us at the midterm demo day. Aarnout was the first project coach that walked by our stand. He told us he would like to see a more specified target group, because he counted himself as one of the people that wouldn't use the product. We want to hold on to the idea that everyone that wants to use it can use it, so the target group will not be fixed to a specific range of age for example. But we agreed that some specifics have to be added to give the product a cleared identity, specifications and so on.

To get a better insight in this we want to observe people's behaviour in the train, to identify our target group. Maybe 'busy people' will not fit our target group at all. Furthermore we want to do a survey on what functions people want to see in our app. We have an idea of what we want to see. But we doubt some functions and we are curious about the opinion of the user. We want to check if the on/off switch is necessary and how we can implement it and how we want to find people 'with a similar taste'. We also want to know how feasible the technology is that we use. How much can we make the prototype work like our real product and how small can we make the electronics. To add up to the survey about the functions, we also want to test the result of the app and of course the product itself by the user. When anything is lacking we want to try to improve our product. And of course this is an iterative process, we want to keep user testing until the product satisfies the user.

At the end of the project we want to do some business and branding. By that we mean looking at a business model, logo, finances, a possible future plan and giving our brand an identity. We think the last one is quite important. When you look at the Ipod shuffle for example, it wasn't the best mp3-player at the moment, but for sure it was a fashion item. Which was one of the reasons that everyone wanted to buy it. At last we want to make a promotion video and poster and make use of the photostudio again, as we were quite satisfied using it last time.



VALIDATION I

WEEK 1 & 2 REFLECTING ON CONCEPT AND USERTESTING

After discussing the feedback of the midterm demo-day within the group and deciding how to categorize it, we immediately started discussing the important and urgent categories.

We wrote down all pros and cons regarding how to find people with the same musical taste via similar genres, artists or songs. Finding a fellow traveller with the same music taste by means of a similar artist is most beneficial because the exact same song is too narrow, which would lead to a very low chance of contact; whereas the same genre is too broad, which would lead to a too high chance of contact. The latter approach often also leads to more unwanted contact, because genres are very diverse.

Whether the online/offline switch is required will also be determined with a public questionnaire. With the help of this questionnaire we want to gain insight into people's thoughts regarding Spotify sharing your 'listening history' with other apps or 'third parties'. Additionally, we want to find out if users of Hapto converse about their music taste easily, for how long approximately and to whom. See appendix 2.

Furthermore we received feedback on our report. Aside from punctuation and spelling mistakes and how to improve our report overall, notable is that we were very engaged in the 'Analyzing and abstracting' aspect of the RTDP model. The coming quartile we wanted to focus more on Envisioning, Realising and Doing by making prototypes and working out the electronics of Hapto. We will Validate Quality with a user test.

In a train or bus it might be very difficult to find other travelers with a similar taste in music, maybe you could 'zoom out' a bit. The conversation right now is not completely natural, because too much information is given beforehand. We looked into the Spotify API more to find out its rules and regulations privacy wise^{1,2,3,4}.

After processing all the information gathered from the first questionnaire, we were still lacking some vital information, such as how users feel about the privacy, especially with all the issues revolving around this topic in the media. Furthermore, we wanted to know if the online and offline switch was really necessary and how much and with whom people like to talk about music. We spread a second questionnaire via social media. The privacy has been offered in three levels, . See appendix 3 for the full questionnaire.

Our findings for this second questionnaire were not very different from our expectations. Firstly, the level of privacy we aim to be active on is found alright by a little over half of those surveyed was. The "Do not Disturb" function on the people who filled in the questionnaire is used by a small majority. Hence, the decision was made to keep the switch for now. 93% of the participants liked to talk about music and almost 90% liked to talk to their friends the most about music. The reason however, was what we most interested in. Almost 60% mentioned specifically that they like to talk to someone with the same taste in music.

To be more aware of the user's interaction with the Hapto we conducted a pilot user test. See appendix 4 for the consent form. We did this in the form of a role play. We briefly introduced the participants to our concept and sketched the situation. This is the short introduction we gave our 'users':

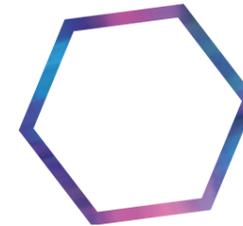
You travel regularly on your own with public transportation. You find that while travelling you have too little social contact. To improve social contact with other travelers, you have bought the Hapto (give the prototype to the participant). On the Hapto there is a compass that shows you in which direction another person with a Hapto has a similar music taste.

After conducting the pilot test, we received lots of feedback, from which we filtered the things we thought were relevant enough to brainstorm about.

A good idea for the business plan would be to start off broad. Create an ideal situation in which the Hapto will definitely work, e.g. a festival. The chance that someone has the same taste in music is larger if every visitor of the festival has the device.



Figure 15: Usertest with Tao.



REALISATION

WEEK 3 PLANNING AND EXECUTION

In this week, time management and the execution of the technology of the prototype was accented. How and what technology we were going to use to make a working prototype for the user tests and the demoday was not concrete nor clear to us. To simplify the electronics aspect of the prototype, instead of a fully functioning physical compass, we decided to use a ring of LEDs to visualise the place of another Hapto user. To make clear that someone with a similar music taste is near, a buzzer will be added. This buzzer will vibrate harder the closer the user is to that other person. To ensure that the prototype can be finished in time for the user test, it has been decided to create two prototypes: one look-and-feel prototype and another prototype that contained all of the electronics.



Figure 17: Starting working on the prototypes.

From the start, we wanted to make our prototype as real as we possibly could. To achieve this, some technology research was required. We needed to know whether it was possible to build a fully working prototype in the time we had left. Two weeks were dedicated to research and implementation of our technical prototype. Hapto's four core technologies were: the positioning & connection system, the method of indicating direction, the vibration system and the NFC-technology.

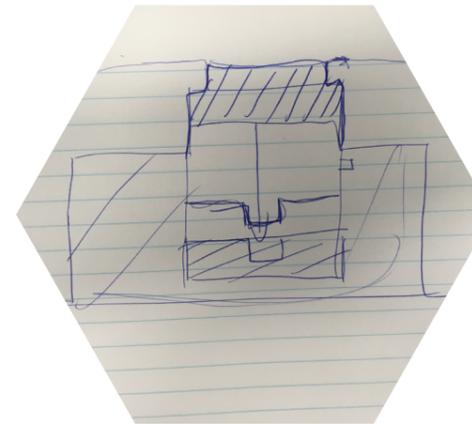


Figure 18: Sketch for compass system for the 3D model.

Hapto needs to be able to connect to the user's mobile phone, as well as other Haptos. Both connections would have to be two-way: the phone and the device needed to communicate about incoming signals and both Haptos needed to exchange these signals. The differences between the connections were the different technologies we envisioned to use.

For connecting accessories to a phone, Bluetooth is generally the most reliable method. There is also a specialised version of Bluetooth for Low Energy consumption (BLE), which would be ideal for a small device such as Hapto. For connecting two Haptos together, we wanted to use something close-range. The function of the device is to make people interact with each other. The device therefore needed to promote this behaviour. That was why we wanted Hapto to be part of the interaction. By keeping the connection as close-range as possible, the device would serve the interaction as a connection point. We chose to take this quite literally: the users would hold the two Haptos onto each other for a short amount of time. This would cause the song a user had selected to be transferred to the other person's Hapto. Options for this mechanism were Bluetooth, NFC or RFID. Both Bluetooth & RFID were more advanced (and thus more power consuming) than our goal required. NFC is capable of sending a simple file or link to and from device. That is what we chose.

WEEK 4 IDEA FOR USERTEST AND EXECUTION

One of the coaches advised us to alter the way we conducted the pilot user test. It would be a user test within a user test. One person of the group will conduct a 'fake' user test, concerning music and the Hapto. Rather than telling what the Hapto does exactly, the explanation will be kept abstract and to a minimal. Then when the conversation is subtly led towards the 'user's' taste in music, another group member will pass by, 'accidentally' overhearing the conversation and asking the person being questioned if they are also listening to a certain artist.

We continued with the realisation of the prototypes. A key element of our device was that it needed to be aware of other Haptos around it. It needed to communicate and exchange information about the user in order to decide who would be suitable for a conversation. Not only awareness of their existence, but also of their relative position was needed in order to make the compass mechanism work. Some technologies for achieving this would be WiFi or Bluetooth location tracking. Unfortunately, both of these were too complicated for us to achieve in the timeframe we had. We also deemed them less important for the communication of our concept through a prototype.

When two Haptos have found each other, they have to indicate where the other user is positioned in order to make sure that both users can find each other. This indication consists out of two mechanisms. One points towards the direction of another user and the other informs the user about the distance between the Haptos and thus users.

We have chosen for a compass to indicate the direction of another user. The compass uses the information of the location tracking system and points in a certain direction. This is a solution of which we think it is an appropriate one. When you look at mechanical possibilities on the one hand and the tangible purpose of a compass on the other. Instead of a visual-only compass, we decided to make a compass that you can also make use of by feeling it. Using a ridge on the compass you are able to feel the direction of the other hapto without having to look at it.

The other mechanism provides information about the distance between two Haptos. In some situations this can come in handy when there are a lot of people sitting next to each other. To satisfy this goal we have chosen for vibrations. The closer the devices are near each other, the faster the vibration patterns follow up on each other. This way of indicating also ensures that the user becomes aware of the connection between the devices and the fact that someone is near with a similar taste in music.

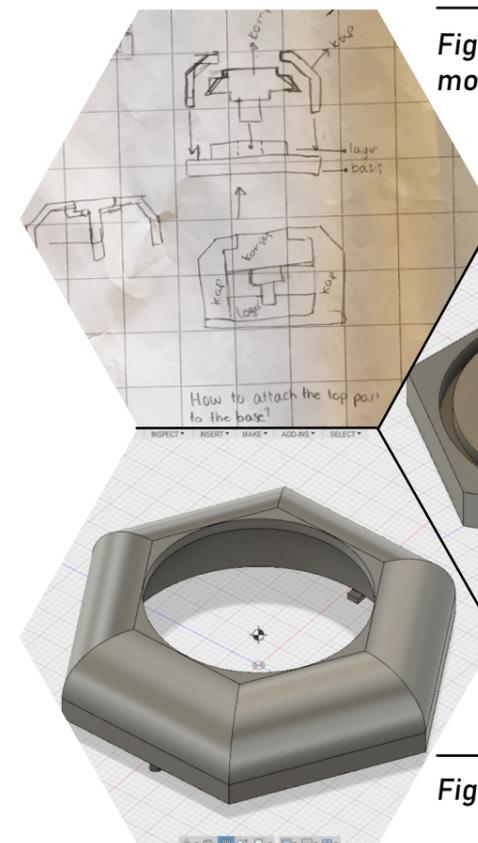


Figure 19: Sketches for the 3D model of the Hapto.

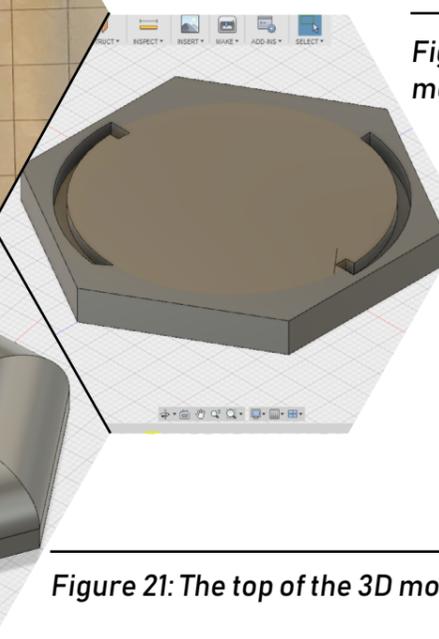


Figure 20: The bottom of the 3D model.

Figure 21: The top of the 3D model.

Figure 22: Working on the prototype with electronics.

Figure 23: Electronics for the prototype.

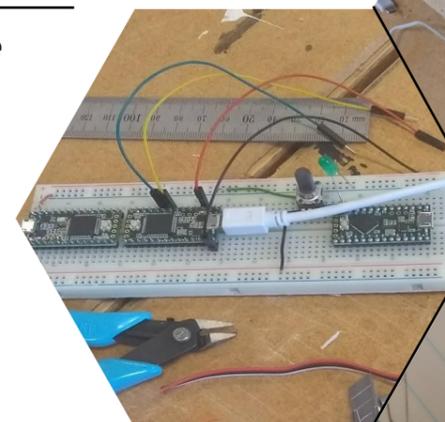
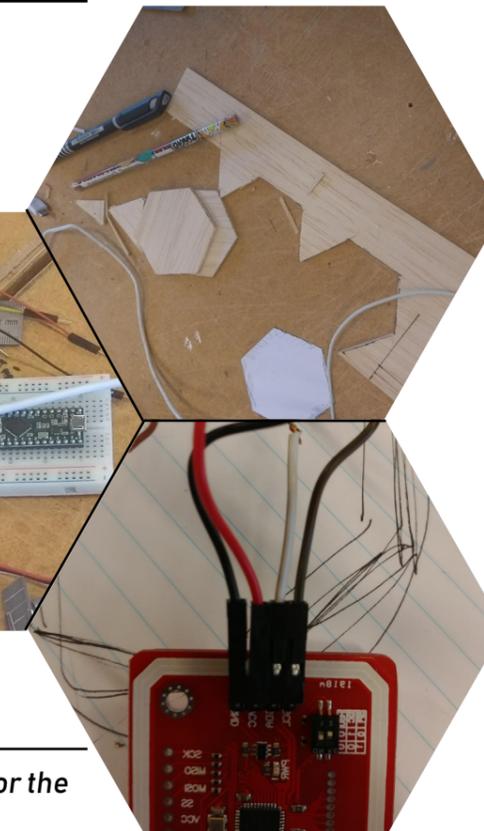


Figure 24: The NFC reader for the prototype with electronics.



WEEK 5 & 6 REALIZATION AND SETTING UP USERTEST

We printed the look-and-feel prototypes with a 3D printer. We have chosen to realise this prototype with a 3D printer because this was the cheapest and fastest way possible that would deliver a sturdy prototype. The prototype needed to be sturdy because the pins used to attach the top and bottom part of the Hapto were very small, so easily breakable. By choosing this method of realisation, slight alterations could be made by filing down small errors and smoothing surfaces with sandpaper. However, several alterations on the model had to be made in order for the printer to be able to realise the prototype. These alterations included creating layers within the top and bottom parts to ensure that the print head was printing on a surface and not in air. Also, the shafts in which the pins slide were too narrow for it to work. By changing these little errors, we were able to produce a proper functioning mechanism for the final demo day. So the choice was made to print both a look-and-feel prototype for user testing and one for the final demo day. In this way we could present a functioning and clean final product.

Our design choices for the technical prototype led to one which resembled the envisioned product in many ways. It had a vibration motor, which had a variable vibration pattern. Instead of a visual and tactile compass, our technical prototype had a ring of LEDs to indicate direction. Reason for this was that our envisioned product requires a mechanical compass, which complicates the prototype more than our current prototype does. It was not absolutely necessary, so we chose to focus on more important parts. The last component of our technical prototype was the NFC-reader: this could read the NFC tag we put on our look-and-feel prototype, so that it would seem as if both contained working technology.

All of the processing of these parts was done on a breadboard containing three microcontrollers, one for each part. Those were connected to two computers: one for the NFC-reader, one for the vibration motor and LED ring. The latter parts required a delay in the Arduino code, which meant that the whole code would halt until the delay was finished. This hindered the NFC-reader, so that had to have its own code running on a different pc. All working parts were contained in a hexagonal box, which was connected to the breadboard through a long cable. This meant that the interactive part of the prototype could be shown and used further away from the controlling part. It enabled for a more refined experience of our prototype.

The meeting with the coaches was a bit different than usual. The coaches from Smart to Touch changed the groups they give feedback on. This brought us a new insight in how others experience our project and enables us to get 'fresh' feedback. What was very interesting was that the other coaches gave very different feedback to what we had gotten so far from our own coaches. Our usual coaches were putting emphasis on technology and realisation of the prototype and the planning of the project. The other coaches were extremely focussed on the concept development and scenario.

As advice they also told us to adapt our pitch, by first giving a scenario sketch and then tell how we wanted to tackle this situation with our concept. When explaining the concept it was important to mention in what kind of way a certain function helps to achieve our goal. This way it will become as clear as possible to other people what we want to achieve and why we made certain choices in our design and concept.

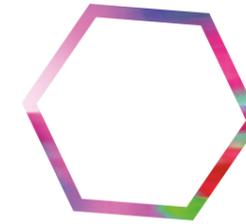
As preparation for the user test we set up the questions we wanted to ask before hand. Secondly, an introductory narrative was in order. This piece of text ought to give just enough information for the user being tested to understand that our project concerns music, but no more than that. Thirdly, the technological and the look-and-feel prototypes both need to be finished. The technological, functioning prototype will be shown to the person, while one of us will have the look-and-feel prototype. The user test will go as follows; At least two people of the group need to be present for the user test. One will lead the user test, ask questions, and show the functioning prototype, while the other will conduct the user test within a user test.

The one leading the conversation will first tell in a minimal way what the project is about. To keep conversation and interaction as spontaneous as possible, this will not be specified too much. The only question that is crucial is what kind of music the person being user tested listens to. The moment this is known, we choose (very subtly, the person being tested must not suspect a thing) a group member to walk away with the look-and-feel prototype in hand. The one leading the conversation will then show the working prototype and secretly turn the potentiometer, so the circle of LEDs will light up in the direction of the group member, who just so happens to pass by with a Hapto.

The prototype will also buzz in intervals decreasing in time the closer the group member gets. The idea is then that the arriving group member starts a conversation based on the music taste of the user. With this we want to imitate a situation in the train where people get in contact in a spontaneous and surprising manner. We will let the conversation lead its own way, while also explaining what Hapto is meant for more precisely. Finally, a song of both people will be transferred to the other, so they have a lasting memory of their conversation.

When the concept is completely explained we we ask the people being user tested what they think of Hapto as a concept, if they would use it, and if they like the situation it will be implemented in (public transportation). Furthermore, what might be even more valuable to us is to see and experience how easily the conversation flows between two people using Hapto.

To build on this experience, we created a fake application on a phone that would look and feel like the application that would be used in combination with a Hapto. This app included Spotify integration, a 'Recently shared' section and an online/offline switch, amongst other things.



VALIDATION II

WEEK 7 USER TESTING

We conducted the user test to get feedback, and to see if the technical prototype functions intuitively and correctly. The latter was for every participant the case. In general, the user test within the user test was a great surprise and those participating in the user test were not sure what was going on at first. However, after the initial surprise wore off, all participants were very enthusiastic and played along nicely.

The consent form that was used for this test is included in appendix 4. The feedback we received was often about things we had already considered, like whether the device can be turned off as well. This can be done by flicking the online/offline switch in our app. Additionally, a different setting was suggested multiple times, e.g. at a festival. Moreover, the those volunteering were not always positive about keeping the Hapto in their pocket, they suggested a different placement for example around the wrist, as a watch or at a keychain.

However, we have also received new insights in our project that we had not yet thought about. A Hapto community, or user base, played a bigger role for the volunteering individuals than we had originally anticipated. A suggestion was made to first offer an app, to build a community and then to offer an additional physical product.

During the coach switch, the other coaches mentioned that our idea was too careful, too tame. We should be a bit more daring and daring. One of the examples they mentioned was that instead of sharing a song after the interaction, an idea is to tap into the music of the other person, more like a radio. The variations we heard during the user test were that a song is exchanged when you walk past each other and when you do not wish to talk, you can first listen to, for example, an album or song the other person shares, without the them being aware.

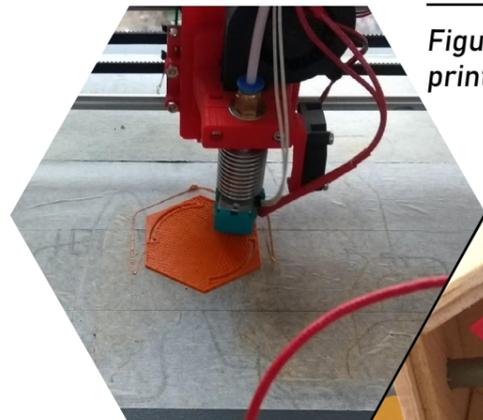


Figure 25: The Hapto being 3D printed.

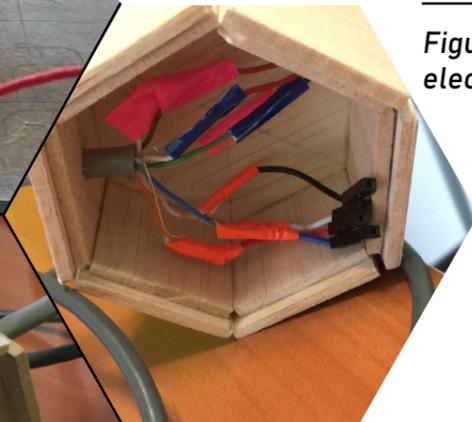


Figure 26: The prototype with electronics in progress.

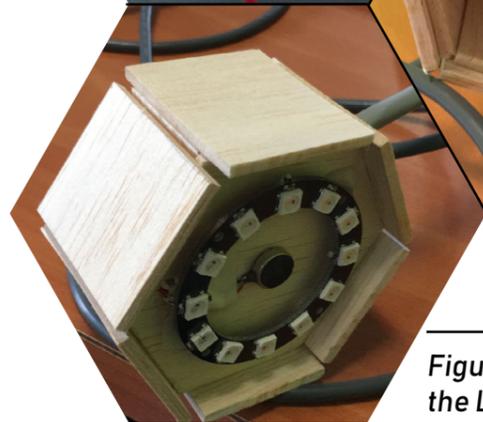


Figure 27: The prototype including the LED strip.

Figure 28: The first 3D printed model of the Hapto.

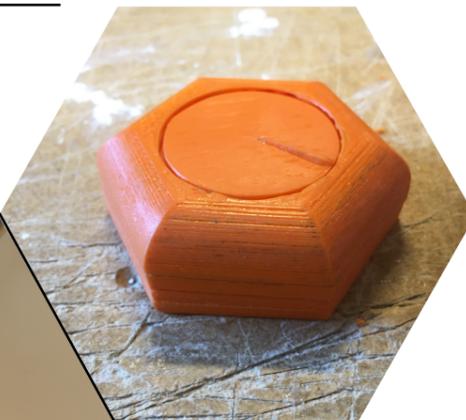


Figure 29: The finished electronic prototype

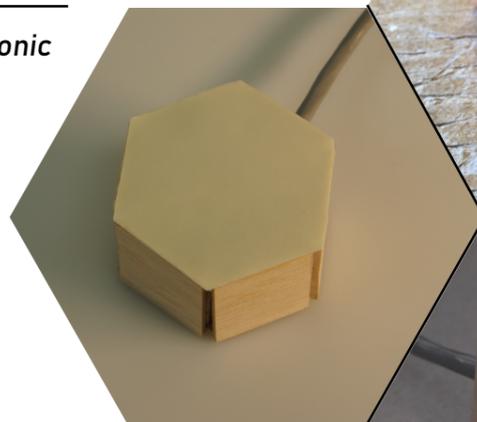
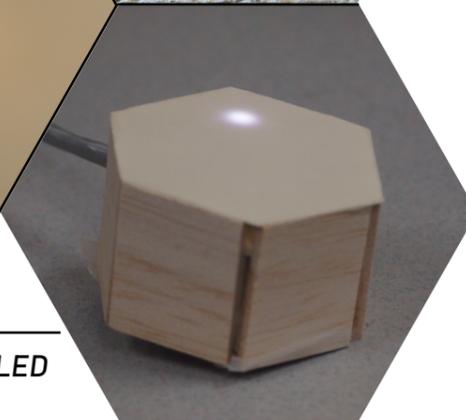
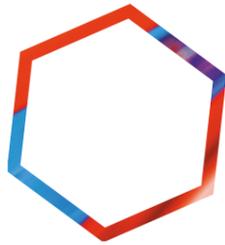


Figure 30: The Hapto with the LED turned on.





BRAND IDENTITY

Looking at our target group for this concept product, we could define some key characteristics. First of all, the age of our target demographic would be in between 18 and 34 years old. The reason for this is that this age group generally listens to music more than other age groups.^{1, 2} For Hapto to work, listening to music frequently is a requirement. Another reason for choosing this age group is that they are more heavily invested in music streaming services. This is just because older people are slower to adapt new technologies.³ A side-effect of this is that younger people generally have more influence on trends, which could work out in our favour. At the moment, our concept requires a Spotify account to work. The chance that it will work is increased when the product is targeted at this group. A last characteristic is that we presume the customer base will primarily consist of people who are deeper into music than the average person of this age group. This is caused by their enthusiasm for music. People like this generally talk more about music in the first place, so this product fits their lifestyle quite well. Actively targeting this group will therefore be more successful than a broader target group of 'more casual listeners'.

The social nature of our concept requires that many people use it from the start. A first step towards ensuring widespread adoption, was to make the brand identity of Hapto reflect the target group. People from this group are invested into listening music. The music industry therefore served as a major inspiration for our brand identity.

We took a look at Spotify's brand identity and identified some important aspects.⁴ For one, the use of color improves the recognisability, as these colors are quite uncommon and scream for attention. Also important are the logo and brand name in the corner. The logo is very iconic and recognizable, but just a logo does not bring across the message "Spotify" yet. So they literally include this in their logo on bigger posters. This is very effective. A last aspect worth noting is that the advertisement clearly shows what the company tries to give their customers: fun and music. Both people on the first image are laughing, relating fun to Spotify as a brand and a service. The second and third image show artists which can be found on streaming service.

launch hype for our product, since none of them depict the product itself, but only the purpose. This hype would help the adoption rate of Hapto; this is crucial to its success. For more on this method of marketing, see our organisational roadmap in the chapter Future Goals. We think this modern approach to marketing, inspired by the music industry, can make or break our product.

This is one of the images we envision for our brand identity. The rest can be found in the appendix. Imagine this, hanging on billboards in front of a train. People are bound to take notice of this because of the very unusual and vibrant colors, the bold text in the middle and the vague reference to a train. This combination ensures people pay attention to the poster. The colors also indirectly attract younger people, because of their more 'modern' and therefore more colorful taste (in general). The image refers to the situation which we target right now: trains.

Our logo in the bottom left corner, has a very unusual and recognizable shape: a hexagon. Again, this is to gain attention from passersby. The slogan, 'Let's talk music.', has the word 'music' in a bigger and bolder font. This serves the purpose of gaining the interest from people who are into music. 'Let's talk' refers to our goal, to make social interaction easier. When someone's interest is gained, the text indicating our (fictional) website should lead them to look up our product on the internet.

These posters are not only usable for billboards, but also for web-based content, such as advertisements on social media. The simplicity of the graphic helps: it is easily adaptable to multiple sizes or formats. By introducing this and similar graphics to the public on all available media, the attention our product would get would surge immensely. This widespread approach can help bring about pre-launch hype for our product, since none of them depict the product itself, but only the purpose. This hype would help the adoption rate of Hapto; this is crucial to its success. For more on this method of marketing, see our organisational roadmap in the chapter Future Goals. We think this modern approach to marketing, inspired by the music industry, can make or break our product.



Figure 32: Spotify branding.

Figure 34: Spotify branding.

Figure 33: Spotify branding



Figure 35: Our Hapto branding



FUTURE GOALS

ORGANISATIONAL ROADMAP

For the coming two years we have set four milestones for Hapto. These milestones are seen by us as critical as well as most desirable to achieve. Firstly a more extensive development of the concept is needed. Then, we will take Hapto to the market. Lastly, we would like to extend Hapto to other applications

More extensive development of the concept

To prevent unforeseen issues in the future, we will first work out the Hapto concept more fully. Besides a concept statement, we will also develop a business concept statement.

Some aspects that will be included in the business concept statement are:

- What our product is
- What our product does
- How it is different from other products that aim to improve social contact?
- Who will buy the product
- Why will they want to buy the product
- How the product will be promoted and sold
- Who the competitors are

We want to have a clear view on what the future of Hapto is, so all imaginable threats are handled beforehand. Technology is in this case very important. The electronic aspect of the device has proven to be a challenge during the project, so we want to work this out as fully as possible before starting the production of Hapto. Of key importance are the location system and integration with Spotify (and potentially other music services).

Take Hapto to the market

After developing the concept of Hapto further, it will be brought on the market. In this phase funding, promotion, production, and networking will start.

Our target group is young adolescents that travel at least twice a week by means of public transportation.

Hapto will most likely be a hype product. To ensure a pre-launch buzz for Hapto, a specific promotion technique needs to be implemented. We are looking towards a fast implementation of the product with minimal expenses as well as minimal costs of the product and services. Therefore, rapid penetration is best suitable [1].

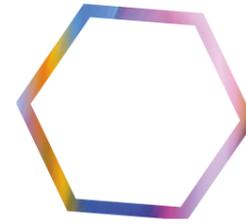
A pre-launch buzz can be created with several marketing activities; [2]

1. Put the focus on the people, not the product
2. Get opinion leaders on-board early
3. Be revolutionary
4. Turn your product launch into an event
5. Take pre-orders
6. Release a product your customers will want to show off
7. One of the values of Hapto is that it also functions as a fashion item. By introducing exchangeable parts of Hapto, this value will be enhanced even more. With a collaboration between several bands or artists and Hapto, users can easily show off their taste music.
8. Draw out the suspense for as long as you can

EXTEND TO OTHER APPLICATIONS

After Hapto has been successfully taken to the market and is making profit we want to implement a different application. An idea for other applications are to implement it at a festival.

If Hapto is implemented in a festival, an ideal situation will be created for the users. The chance that someone with the same taste of music is around in a small range is much larger. This might be a good way to implement Hapto, without placing it in the proper scenario yet, users become familiar with the concept in a playful manner. At a festival like Pinkpop or Sziget, there are artists from a variety of music genres, which enables users to find other visitors with the same taste in music faster. This is in line with the fourth point of the pre-launch marketing activities: Turn your product launch into an event.



REFLECTIONS

REFLECTION ON OUR INTERIM FUTURE GOALS

At the end of the first half of the project, we set some goals for the second part of the semester. We have evaluated if we reached those goals and how we came to reach them.

One thing that we heard throughout the project was that we had to design for a more specific target group. At first we wanted to keep the target group as large as possible, so the group of potential buyers is as large as possible. However, for the branding phase of Hapto, we described a more specific target group.

In the second week of the fourth quartile we conducted a questionnaire, spread on social media to find out some specifics regarding our app. One of the most important aspects were whether the on-line/offline switch was necessary or not, because during the midterm demo day opinions were both positive and negative. The conclusion of the results of this questionnaire was that we had to keep the switch. Many people were concerned that they always had to start a conversation when a 'match' was made. During the user tests and the final demo day, this was also the main concern of many.

We were not able to create a fully functioning prototype as we would have wished. The coaches were very involved with the technology aspect of the project and offered us much help. An example of this would be that the technological prototype has an LED ring rather than a mechanical system, with an exterior like the look-and-feel prototype. During the user test we also showed the app. The people volunteering to participate found that the app was clear. We have lost a lot of time working on the technical prototype, mainly because the soldering was not always as strong as needed. For this reason we had to move the user test one week towards the deadline.

One goal that all members of the project group were passionate about was the business aspect, and even more specifically the branding of Hapto. In the end we did not make a business model and also did not look into the finances in the literal sense. We have briefly touched the subject in a branding and marketing phase in week 7.



PAUL ROELEN

Reflect on the design, research process, integration, collaboration, organization and planning.

With hindsight I think I have learned a lot this first project. I did not only develop my goals as described in my PDP but also some general professional skills as collaborating, planning and communicating. Especially the last one has been revealed as a very important one. The communication was far from uniform in the beginning of the project. We thought we came to an agreement after every meeting. But when we gathered for the next meeting everyone had different thoughts about the arrangements of the previous meeting. I am glad we improved this throughout the project, because the lack of communication or uniform agreements was in my opinion one of the reasons that the productivity had to get going in the beginning of the project.

The reason for this was that some team members had done some work whilst others thought they had to wait with certain tasks. When we got adjusted more and more to each other the group work became more fluent and efficient.

We solved the communication problems by formulating tasks and deadlines at the end of every meeting. This was one of the tips we extracted from the meeting skills workshop.

During the ideation phase we have been thinking about different topics for our project but at first we weren't fully enthusiastic about these topics and we also couldn't agree on one. After a while we finally agreed and we started ideating. Again we couldn't really think of an interesting situation or problem in the area of our topic. At least not a clear formulated problem.

At a certain moment during the ideating we received a tip from Jens, one of the project coaches, about different ideating techniques. And that really helped me to break through the routine of this uninspired, dull and for me personal demotivating situation. And as we had chosen a well-formulated problem we could really start with the project.

Looking at my planning skills we also improved, also because we did the planning and organization workshop. Comparing the midterm and the final demo day we were much more prepared for the final demo day, although we had some trouble with the prototype. I think that is due to the extra week we planned before demo day, to do the finishing touch. This was a one of the most useful tips we received from the lecturer of the planning and organization workshop/tutorial.

I think I have considerably improved on the professionalism of my work this year, compared to my level on my secondary school. I like that the things are getting more serious.

Overall I think that the group needed to start up but after a while worked together well. We could hold debates with each other in a fierce but respectful way. The tasks were equally divided and delivered with good quality. I am already looking forward to start the new project.

JEF ROUSCHOP

For the past semester, my team and I have worked on developing our concept for Project 1 'Smart to Touch'. Let me start off by talking about our teamwork. Overall, I believe that our team worked very well together: chemistry was on point, everyone participated equally in all sessions and tasks, and the feedback we gave each other was generally very constructive. This last point is not something you can take for granted in any team, so I was glad it happened so naturally. Our communication, however, was not perfect. Sometimes people were absent without giving a reason; some tasks were carried out in a particular way, but there was no communication as to why or what that way was. Luckily, we noticed this trend, discussed it and disciplined our communication better for the last month of the project. We all learned how easily it could go wrong, which helped identify and solve the problem.

A major flaw of our group approach was that tasks were divided strictly, while no one had a clear overview of the matters that were necessary or completed. For the last quartile of the project, I tried to fulfill this role by keeping the meetings more structured than before and organising what had to be done in what week. The whole team planned everything until the deadlines of demo day and the report, which was a handy tool for keeping things more structured. Points of improvement are that communication & organisation of teamwork needs to be clear from the start. Having a plan from the beginning of a project can help with this.

Another lesson I have learned through this project: how to handle feedback. We got quite diverse feedback from people we talked to, and especially the coaches. Often, we even got contradictory feedback from the latter group. At first, this confused us immensely. We tried to 'keep everyone happy' by implementing all these feedback points in our project. Yet this felt forced and the feedback was sometimes very opposite to the direction we wanted to take our project. So, we decided to stop implementing all feedback and to start filtering the feedback we found useful. I do not resent the fact that some coaches had different ideas on where to take our project. I believe it actually made our project better, since it made us see different perspectives, which forced us to think about what we wanted to do, resulting in a better result.

One thing I did not expect was the direction our project went for. Since we were working with the theme 'Smart To Touch', I expected a huge focus on materials and tactile experience. In retrospect, we did not focus on that at all, as the social aspect of our concept took most of our time. It was our starting point, which led us to the concept of a compass that helps with social contact. The difference between initial and final angle is not a bad thing: I believe that looking at our chosen subject (social contact) from a very non-traditional angle (materials, tactility & looks) helped in creating a unique and interesting concept.

Lastly, I am very glad I could work on some of my goals for the future, as described in my PDP. I helped create the brand identity for our product, Hapto, and researched that of another company for inspiration. The result can be seen throughout our report. Prototyping was something I practiced too, as I played a major role in the technical prototype development.

LENA OPHEIJ

The fourth quartile of my first bachelor year I have continued working on reaching my goals as well as helping other group members reach their goals. The most important professional skills I have learned within this group were planning, listening, and communicating clearly.

In the first half of the project we did not have a clear planning, but while following Plan your Program, we made a planning for the rest of the project and made sure to keep this planning updated and add more details after the midterm demoday. Two team members were very strongly opinionated, which sometimes led to minor conflicts. These conflicts were easily solved by listening to both opinions and letting both team members speak their mind. Communication has been often been an issue in the third quartile. This was at the time something we very eagerly wanted to change, mainly because our coaches were also pressing to be transparent to the rest of the group. We really took their advice to heart and discussed what our goals and visions were for the project. After that was clear for everyone, we were also able to take into account other's wishes. For example, Jef wished to look more into branding and marketing, since he had not spend a lot of effort in developing the Business and Entrepreneurship competency yet.

The work flow in the group went well. Tasks were divided evenly. However, the strict planning and this clear division of tasks was not always equally efficient. Sometimes people had to wait until another team member was finished with a task that had to be finished first. More specifically, we had to wait with conducting the user test until the technological prototype was finished. There arose some complications while conducting a user test, which led to the prototype malfunctioning. At that moment we finished the user test, but refrained from proceeding until the prototype was functioning properly again.

A point of improvement for me personally would be to ask coaches to give a more clear explanation when I don't understand something fully. The coaches were not very consistent with giving feedback, which led to misunderstandings and confusion within the group sometimes. For future projects, I wish to reflect more on the feedback given. In this project, the feedback we received from the coaches was sometimes completely opposite of what we all thought was best for the project overall. A good example of this was the technological prototype. Most of our coaches were extremely focussed on getting the technological prototype to function, rather than developing the concept to be stronger and more convincing.

For future projects I aim to go more in-depth. At the moment I think I could have given more insights in several aspects, mainly competencies concerning Math, Data, and Computing and Creativity and Aesthetics. I had hoped that I would be functioning on a more professional level and was not always convinced that the level of difficulty I was working on was what is expected of me at a university. Though, I think that this will not be a problem for the coming years., and by doing things I have never done before, I hope to create more challenges to my projects. What I did enjoy however, were the explorations of different materials. Though my expectations of a project focussed on 'Smart to Touch' were more directed towards material explorations. Gladly, I was able to include my own material development. A goal that remains for me is to create my own material portfolio.

VERA TAK

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APPENDIX

APPENDIX 1 SWOT ANALYSIS

<p>Strengths</p> <ul style="list-style-type: none"> - Gives people a choice (to use the device) - Subtle (only for you) - Lower threshold social contact - provides more input options (headphone jack) - Gives certainty - Exchange music - Both people are aware of each other → connection from both sides - People can use their own accessories (e.g. headphones) - You don't forget it easily, because you need it as a dongle. - You can use the power of the phone, no external power source needed. - You can use the product without everyone to buy it. 	<p>Opportunities</p> <ul style="list-style-type: none"> - Could make your journey less boring - Connection music -
<p>Weaknesses</p> <ul style="list-style-type: none"> - Large design - Complicated idea - Densed technology - expensive - Only in pockets, not very close to body/ compact - Lots of connections, no universal - lots of wires - Device has to be very "smart" - Device must save the music profile - Precision GPS - You must always use the device to build up your music profile - Value proposition is not very high. - Shape gives not a lot of opportunities(because of all the inputs/outputs and technology, must fit in pockets) 	<p>Threats</p> <ul style="list-style-type: none"> - People might be not social enough for this idea - An app could easily replace the device - People might forget it -

APPENDIX 2 QUESTIONNAIRE 1

What is your gender?

- Male
- Female
- Other

Do you travel together more often or alone?

- Together
- Alone
- Alternating between together and alone

Activities while traveling

What kind of public transportation do you use most often?

- Bus
- Train
- Tube
- Tram
- Other...

When you travel alone, what do you do?

- Listen to music
- Read
- Play a game
- Talk to other travellers
- Do homework
- Check Social Media
- Check my phone
- Other...

What is your average traveling time?

- Less than half an hour
- Between half an hour and an hour
- Between one hour and two hours
- Two hours and more
- Other...

In two words describe your public transportation experience regarding other travelers, when you travel alone.

...

What could improve your travel?

...

Social Contact

Do you often have a conversation with strangers while you are traveling alone?

- Yes
- No

If yes, what motivates you to have this contact?

(If your answer to the first question on this page was no, please skip this question.)

...

If no, what is the reason you do not have this contact?

(If your answer to the first question on this page was yes, please skip this question.)

...

Thank you for participating in the questionnaire!

APPENDIX 3 QUESTIONNAIRE 2

Questionnaire 2: What do you think?

Hello! Thank you for helping us with our research concerning several subjects by filling in this short questionnaire. This questionnaire is completely anonymous, we will not ask for personal information that might link you to the research results.

Scenario

Spotify is at the moment very popular. A unique function of the service is that it offers suggestions based on songs you have played recently. You should think about artists or albums you might like. The next three questions concern this.

On a scale of one to ten, what do you think about these suggestions, one being extremely negative and ten being extremely positive?

...

On a scale of one to ten, what is your opinion about these suggestions being used to make contact with other people, one being extremely negative and ten being extremely positive?

...

On a scale of one to ten, what is your opinion about these suggestions being used by third parties, one being extremely negative and ten being extremely positive?

...

Do not disturb

The next questions concern the “Do not Disturb” function on your phone. This function makes sure that you will not be interrupted by certain functions.

Do you use the “Do not Disturb” function on your phone?

- Yes
- No

Why do you or why do you not?

...

On a scale of one to ten, how often do you use this function, one being never and ten being always?

...

Passion for music

For the last part of the questionnaire several questions will be asked concerning your passion for music.

Are you able to name your top three of music artists?

- Yes
- No

On a scale of one to five, how much do you prefer to talk about music, one being not much and five being very much?

...

For how long would you be able to talk about this?

...

With whom do you like to talk about music?

- Family
- Friend
- Colleagues
- Partner
- Strangers

Why do you like to talk about music?

...

Thank you for filling in our questionnaire!

APPENDIX 4 CONCENT FORM

Thank you for taking the time to help us with our first bachelor project for the faculty of Industrial Design at the Eindhoven University of Technology.

For this project we are looking into a relationship between social contact and music in the form of a product called Hapto. The device shall function in a train, or any public transportation for that matter.

We will walk you through a user test with both our technological prototype and our look-and-feel prototype. The technological prototype is a fully functioning model, with several functions that will be explained during the user test. The look-and-feel prototype is what the product should look like in the end. An app will also be shown, for which further instructions will be given during the user test as well. Firstly, we will sketch a situation, a scenario sketch so to say, to get a proper idea of where we wish to implement Hapto.

With this research we want to test if the product and system delivers the same effect in reality as we aspire in theory. Our aim for this user test is to form a conclusion based on the feedback to improve the concept as it is at this moment. To get to these conclusions we would like to take pictures and record the conversation. These pictures and recordings will exclusively be used for the research and your name will not be mentioned, so the user test is completely anonymous. There will be no risks bound to the execution of the user test.

This user test is entirely voluntary and you may halt the participation at any moment. We will try our utmost best to explain everything as clear as possible before starting the test. If or when the given explanation is not clear enough or you wish to have more information regarding the project, you may ask them before starting or after finishing the user test. After signing this document we will commence with the user test.

Hereby, I agree to the terms and conditions mentioned above.

Signed by:

Date:

APPENDIX 5 DISTRIBUTION OF THE TASKS

During the first part of the project we all worked together, this part mostly consisted of brainstorming about a topic and a current problem or situation. Jef and Vera read some papers in the brainstorming about the topic part. Before we chose a topic we all researched a different topic and we did a report in the meetings to the other team members. When we started the ideating phase we all did separate research to a certain part of the idea, whether it was possible and how we could solve the different parts, again we did report to the other team members.

Before we started with the realisation we also made two questionnaires with all the team members. After finishing the first ideating phase we started to research the realisation of the idea. Because we thought it would be inefficient to work on the prototype all together we divided the tasks. Vera and Lena started to work on the 3D-model and the look and feel prototype while Jef and Paul worked on the realization of the technical prototype. Vera worked on the 3D-model and Lena made sure that the model was printed and worked properly. Jef dealt with the 3 functions, the NFC-reader while Paul kept himself busy with the vibration and direction functions, soldering and making the shell of the electronics.

While working on the prototype Vera set up a usertest that we could conduct when the prototypes would be finished.

When we were finished with the usertest we started working on the presentation for the demo day and the report. Jef en Vera worked on the branding of the concept. Together we shot the video, which Paul edited afterwards; Jef worked on the posters and visuals; Lena worked on text of the report and Vera worked on the lay-out of the report and the scenario. When the report was finished we all corrected the report.

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