# Reflection M1.1 Design Project

M.H.M. Vermeeren - 10/01/2019

In this project my main development goals were responsibility for the technological and programming aspects, building multiple prototypes, conducting user interviews and context research, and running a professional user test. (Main competencies: Technology & Realization and User & Society.) Furthermore, I aimed to improve the documentation structure of the work process, practice sustainable working methods following up on my rehabilitation, and do a personal project for portfolio building purposes.

During the process my focus shifted from the programming aspect to the electronics after testing some initial code for the distance sensors, due to practical considerations such as this task becoming larger. I also took on some responsibilities regarding visuals and prototype hardware.

The electronics were a challenge because of the sheer amount needed in our prototype. Designing and building the circuits took a significant amount of time, especially the soldering of individual NeoPixel LEDs, as well as making adaptations due to unforeseen issues with the prototype. Although I did not have a lot of initial experience with electronics, I learnt a lot from experts and online tutorials.

After creating several proposals for operational components and consulting with an electronics expert, I created the current setup which best suited our design decision to integrate input and output. Components such as the distance sensors, external power adapter, operational amplifier, and Teensy board were new to me but were less intimidating to learn than I initially suspected. To further develop my skills regarding electronics, I will keep an open attitude to working with unfamiliar components, which should also allow for more freedom in design and function in future prototypes. I also gained several insights in saving time for future prototype building.

The earlier mentioned issues were caused by practical scheduling circumstances, which did not allow me to test the full prototype's operation beforehand. The team member responsible for the programming wished to connect and calibrate the distance sensors himself after I had finished my construction and testing. However, only these sensors were tested, which caused us to overlook that the LEDs needed a 5V input to operate, which was provided by the Arduino board I had tested with, instead of the 3.3V output of the Teensy board in the final prototype. I strengthened the input signal with an operational amplifier to solve this issue, and improved upon the prototype's durability by remaking the connections of the LEDs and distance sensors, which had become damaged during transport. This delay unfortunately impacted the final user test, for which a new protocol had to be designed. In future scenarios, I will make extra effort to extensively test a prototype before use in the field to prevent such unknown factors.

During the project we were all involved in an extensive exploration of the user and context, as well as conducting user observations and testing, which was immensely useful for doing observations and processing data. Although my future projects are individual, I will try to involve another student with a similar target group to help each other with observations during our respective user tests. Although I gained more experience observing and interviewing, the more formal aspects of setting up a study were most important to my development. Because I've mostly conducted usability tests before, which often have open-ended testing goals, this experience is useful for my M1.2 project.

When creating visuals for the app interface and presentation materials, it was sometimes a challenge to communicate clearly. Colour use and visual language played a large role in this. I gained some experience with these aspects, which I plan to apply in the upcoming semesters to improve the quality and clarity of my visuals.

Through regular meetings with the study advisor about my progress and pitfalls, as well as students who deal with similar issues, I was able to better distribute my priorities and workload. During the semester it became clear that to work more sustainably and stay fully devoted to the project, it would not be possible to conduct a personal project. Keeping these limitations in mind, I was able to make informed choices about my Mentor and further study plan.

Early on in the process, the whole team agreed to keep a week-by-week documentation of our project to improve the oversight of our progress. We rotated the roles of chairman and secretary each week, which helped us contribute equally to keeping this oversight. We had a long ideation phase, in which we conducted extensive literature research and mapped out the context and goals, but realized we needed to start making final decisions about our project's direction. Therefore we made a planning of goals, activities, and responsibilities for each phase. This also helped our Coach understand our plans, which allowed him to provide us with useful feedback and information.

Although we did not formally define our roles at the beginning, we had defined our strengths and interests and took on responsibilities accordingly. Everyone was extremely motivated, and it was pleasant to work with them in large part because we could easily combine our shared interests and visions into a harmonious team vision, and because we all had an open attitude to feedback regarding our roles. In the teamwork workshop we formalized our roles, which gave us an extra opportunity for concrete improvements on how we conducted ourselves in the team. In future teamwork I will draw back on this experience as a standard of a successful team dynamic.