Summary

Nedap is a high-tech company focusing on high-quality and innovation, with the Dutch headquarters located in Groenlo. It has a vested investment in the livestock industry, with products in the dairy and pig farming sector sold worldwide. These products focus on improving the quality of life for farmers. Nedap wishes to continue their product line by creating a universal sampling device for cows. They are currently in the starting phases of development. Nedap focuses on the technical side of design, or in other words, 'how to make it work'.

In this thesis, the user-related side of design of the Universal Sampling Device (USD) is explored in a usability study. The aim is to find and catalogue possible weaknesses in the current ideas concerning user interaction and experience, to set-up a list of requirements that can be used to test the viability of future concepts regarding user interaction and experience, and to propose concept directions for the fastening subparts. This will allow Nedap to take these aspects into account during the early phase of the design process.

First, the current ideas of the USD are analysed for potential weaknesses.

Existing sampling devices, the current design of the USD, and the differences between them are examined. This is to establish what existing devices are lacking, what the USD brings to the table, and what the USD may lack compared to existing devices. Next, the users of milk sampling devices are catalogued along with their goals, experiences, and the different usage situations. The results form a user profile that can be used to finetune the USD to the users' needs and wants. Relevant guidelines for designing user interfaces are explored to see how they can be applied to the USD. A user scenario is run through with an eye on the areas that can be improved, with the weaknesses listed in the conclusion.

Next, this information is built upon by adding numerical data that is used to create measurable criteria for the usage requirements.

It starts off with the physical limitations, i.e. the dimensions of the milking parlour and the milking equipment. These impact how much space the USD can take up as well as how and where it is placed. Next, the ergonomics are discussed. These influence how and where the USD is placed too, in addition to other interaction with the product. Lastly, relevant guidelines and regulations are examined. These contain design requirements that could otherwise be forgotten.

Usage requirements are then drafted. These requirements are final for this thesis but are intended as a first version for the USD project as a whole. This is because requirements often change during the design process. As the USD project at Nedap is still in the beginning phases, it is likely that changes to the requirements will be needed in the future.

Finally, the ideation and conceptualisation phases of the design process are run through for two subparts of the USD. These two subparts were chosen due to the current versions being flawed in some respects, as found in the weakness analysis, and there being no new ideas for them yet.

The design process of the two parts is the same: first, ideas are generated. These are then scored on relevant requirements. The idea that comes out best is further developed into a concept, which is then scored again on the same requirements. The concept is compared to existing versions, to properly gauge how they match up. This provides a stepping stone for further development, with suggestions on what areas could be explored in later phases of the design process.