THE DEVELOPMENT OF A MODULAR COFFEE MACHINE

The design and development of a modular coffee machine as a communication model

Dorien Boiten, Industrial Design bachelor, University of Twente, the Netherlands

In this thesis the development of a coffee machine for PCV Group is described. PCV Group is a technical consultancy agency that develops technical solutions for different markets. A considerable share of the parts developed by PCV Group is for the coffee industry. Consequently, PCV Group has developed knowledge on all parts present in a coffee machine. To demonstrate this knowledge to potential clients, a demonstrator is developed in this assignment. It must be possible to later change this demonstrator to fit PCV Group's new developments.

The goal of the assignment was to develop a modular coffee machine, which functions as a demo model for the techniques used in the machine and could aid the further development of these techniques.

It was chosen to start demonstrating PCV Group's knowledge on coffee machines by making the machine brew the 'ultimate cup of coffee' . Therefore, research was conducted on the characteristics that influence the quality of the taste of coffee, this were general characteristics and characteristics that can be influenced by the machine. These characteristics were obtained by performing a literature study and expert interviews. Subsequently market research was performed on modular products and products that demonstrate technology. With the help of the results of these researches and client interviews requirements were composed.

In the next phase ideas were generated. These ideas were divided into three concept tracks:

- a puzzle track, where the housing was built from modular puzzle pieces,
- a closet track, where the housing contains compartments to store the components
- a shelf track, where the housing merely consist of shelfs to stimulate the openness of the product

These three tracks were used to generate three concepts. These concepts were reviewed and after the review it was decided to continue with the shelf track but with a more technical approach. The new design would resemble test setups used by PCV Group.

In the detailing phase the design as decided during the concept review was detailed. The frame to hang the components on was designed together with the configuration of the components on the frame. Furthermore, the communication to the user was developed further. Physical aspects were designed to attract the attention of the user to the correct position on the frame and a user interface was designed to demonstrate aspects of the machine that cannot be viewed. These designs were used to build the product although some of the designed details have not yet been incorporated.

Since the design of the machine is much like a test setup it is easy to change components and to use the machine to develop new or better techniques. The open design of this setup helps to demonstrate the techniques and the user interface completes the demo function. Since the product fulfils these functions PCV group was satisfied with the delivered results and will use the product for future projects.

Recommended steps for the further development of the machine are to design a custom control system to create more freedom in the use of the machine, to incorporate safety aspects and to improve the tidiness of the machine.

FIGURE 1: THE DESIGNED COFFEE MACHINE