Usability of washing machines

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Introduction

Generally, people use their washing machines about 2 to 3 times a week (hier, 2016). However, the washing machine does not seem to be used to its full potential. In assignment 1 evidence was found to conclude that the process of washing is not very intuitive. For one thing, the labels on clothing seem to be unclear and the link between the labels and the option on the washing machine seems ambiguous. Next to this, there are many options on a washing machine, of which most are not even used. In this paper, a theoretical analysis for both of these issues is made.

Analysis 1

The labels on the clothing are unclear or are not used (well)

The first problem that was observed in the usability tests, was that the labels in clothing were unclear and did not support the user in the washing procedure. Two out of five participants did not use the labels, resulting in washing at a temperature that was too high, two participants had to search for the labels online, and one participant looked at the labels, without understanding it. Because the labels in clothing are supposed to give the right instructions for washing, it is important that they can be understood easily. If one has the right instructions for washing clothes, chances are higher that the clothes will not shrink or that they are damaged in a certain way. In addition, in case the symbols in the labels are linked to the washing machines in a logical way, it will be less time consuming and confusing to do laundry.

Analysis 1

The labels on the clothing are unclear or are not used (well)

Theoretical analysis

The usability test of Assignment 1 focused on the usability of a washing machine, but this first problem occurred in a related system, namely the washing labels in clothes. These labels were designed to help users find out how to clean a specific item of clothing. However, the symbols used on these labels are unclear to the user and therefore ignored or used in the wrong way.

According to the users, it is not clear what the symbols mean or imply. A problem with the system is that it doesn't use archetypes to get a universal understanding of the symbols. An archetype has the most important characteristics of an object, which would make it easier for users to recognize instead of the abstract symbols that are used on washing labels (Rosch et al., 1975). Moreover, the symbols on the washing labels, apart from the numbers indicating temperature, don't match the symbols on the washing machine. This lack of consistency makes it harder to match the symbols on the washing labels to their practical meaning for the washing procedure.

The context of use of the system comes into play as well. The context of using a washing machine can be different for every item of clothing. Especially when using a new washing machine with a lot of functions, a lot of symbols might be needed on the label which can cause an information overload. Pilli and Mazzon (2016) found that information overload can lead to choice avoidance or an endowment effect - where the default option is preferred. This effect also showed in our usability tests, where participants very often chose a regular washing program if they did not know what to do. This can be problematic for several reasons, as will be explained in the second analysis below.

With regard to the user, there are several characteristics of our brain that make the use of these washing labels more difficult. Our brain has trouble with logic (Kahneman, 2011), and apparently the logic on the washing labels is too difficult for the human brain. Moreover, our brain is opportunistic whenever possible. We like to offload information to devices and use them as a transactive memory (Ward, 2013): as long as we know how to Google the meaning of these symbols, we believe to be fine. Multiple participants indicated during the usability test that they would use the internet to find the right washing program. This could be a reason why the washing labels stay unclear even if users have learned their meaning before.

A last problem with regard to the user is that the washing labels are not suited for visually impaired people. The symbols on the labels are really small so even for moderate visual impairments the use of these washing labels becomes difficult.

Analysis 2

Observed problem:

There are many options for washing programs of which most are unclear

Most of our participants had trouble finding the right washing program for their laundry; some did not understand the meaning of many programs, some chose a program that would not wash their clothing at the right temperature. The big amount of information confused the participants and they randomly chose the settings - often the "standard" washing program, or mentioned that they wanted to search for information on the Internet. This indicated that it was not clear enough to the participants, what the difference is between the programs, and why all those options are there. Not only does this affect the time and effort that is required for doing laundry, it could also have consequences for, i.e., the environment - as the amount of water that is used could be reduced by choosing a different program - or deterioration of the clothes' quality.

Theoretical analysis

With respect to the system the main issue, as mentioned by the participants, is information overload, because the participants cannot find the right washing program. There are too many buttons and/or symbols and textual information that makes the interfaces counterintuitive and is not consistent with the washing labels. Furthermore, there is lack of clear guidelines, i.e. there is no proximity compatibility, and there is a too high abstraction level, i.e. to little redundancy gain. All these shortcomings are inconsistent with the principles of display design (Proctor & Van Zandt, 2008, pp. 197–208). Besides, the interface is hardly adapted to the user (not intuitive), rather really functional and computer-like which makes the information not relatable and thus causing wrong decisions (Salvendy, 2012, pp. 1431–1436).

Even if a correct program is selected there are still a number of other parameters that are very abstract and/or of which the added value is not mentioned, such as the rates per minute (RPM), rinsing or washing time. This has to do with the fact that these functions are not directly connected or have similarities while our minds tend to group things to recognize one entity or a connection according to gestalt laws (Brownie, 2006), thus our minds perceive these functions as abstract components. This same problem occurred when the participants tried to select the right washing program, their mind was not able to connect the washing label with the right washing program.

Furthermore, the goal of the user influences the amount of information, i.e. with a regular program they might not care about the time or RPM whereas in, for example, a situation with limited time this does matter. Because the amount of information does not change (the washing machine display) but more actions are required, less is known. This increment of actions results in more knowledge based mistakes, perceptual errors in which the amount of information is not adequate enough to support the understanding (Wickens, Lee, Gordon, & Liu, 2004, pp. 346–348). That is why the participants found special programs even harder to perform.

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