Study on enhancing EMSA's food storage products.

Industrial Design Engineering Bachelor Assignment

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Public summary

This project is a collaboration with the University of Twente and EMSA. In short, EMSA is a German company located in Emsdetten. EMSA is a medium-sized manufacturer of consumer goods, kitchen utensils and garden equipment. This bachelor project revolves around finding a way to enhance EMSA's food storage products. The project is a continuation of an earlier attempt where the idea included the need of a secondary device as well as an app. Because of certain arguments, these aspects were found to be undesirable, therefore this project focuses on a stand-alone product.

In a time where everything is connected to a smartphone and their apps, it can be challenging to design without relying on them. Therefore, this project was searching for an opening move to kickstart this campaign. The opening move was to look for a more profound reason to enhance EMSA's food storage, an underlying problem. The question that occurred was: "Why is it bad, when we throw away food?". Multiple answers were found during the first analysis phase, where the fixtures and consequences of consumer waste are put in numbers. In *figure 1,* the fixtures of the consumer waste per capita are shown, according to (Gustavsson, Cederberg, Sonesson, van Otterdijk, & Meybeck, 2011).

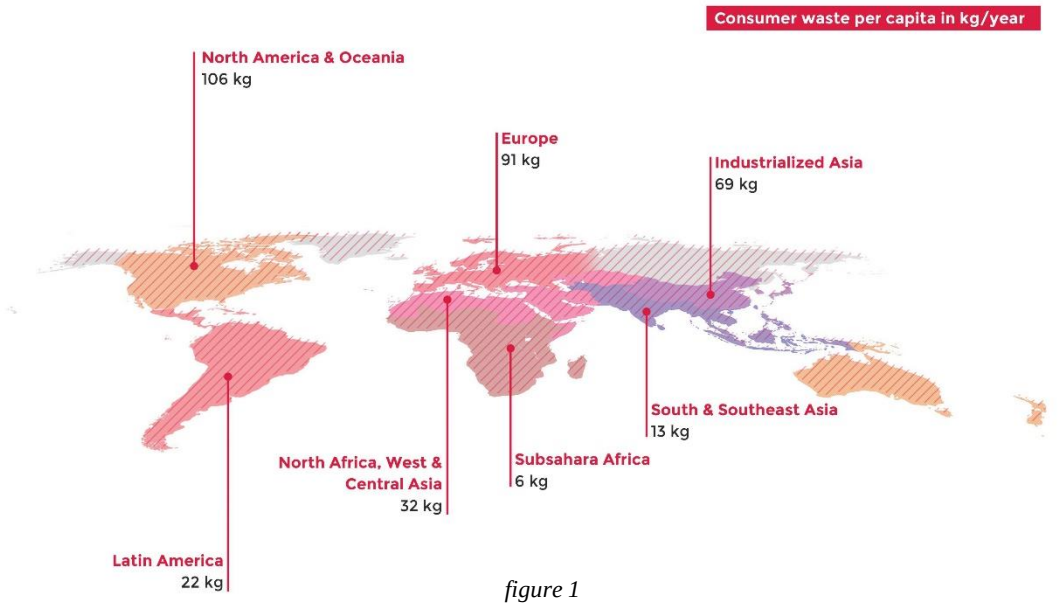

figure 1

By depicting the consumer scenario, two possibilities were found to tackle this problem at consumer level. The first aspect was making the user more certain about the duration of their food storage. The second is making users more aware of their food that has been stored. With these two to work with, the project developed its first concept where it tackled these problems. From this concept on, the direction was set to reduce consumer waste and develop this product. By evaluating this concept, the list of requirements was altered to lead the project into a more definite direction. The biggest change

here was the shift in focus towards only the clip and close range of EMSA. In a second iteration, more research was done about the clip and close range as well as the perception of time of the users. These two elements were included into the next concept, that was focused on operating fully analogical. This concept was divided into two parts, with one being the attachment, the other the working product. To specify the framework of this project, some excessive testing was done resulting in some changes in the list of requirements. Despite the fact that a fully analog version was not found feasible, the results that were added are later on found to be essential. In the last iteration, the use of batteries was re-introduced. A concept with a battery was then created, followed by a hybrid concept that also implemented parts of the analog concept. This hybrid concept was worked out into a final design and was compared with the list of requirements that was created along the way. As a conclusion, the final design was approved according to the list of requirements and was ready to be worked out in more detail. The final design was modeled with a 3D software program where every mechanism was worked out. This digital model is shown in *figure 2* and 3. Eventually this 3D model was recreated by using 3D printing. With this model additional tests were done to compare it to the remaining criteria of the list of requirements. Stack ability was the one criterion that was not fulfilled by the final product and was listed as a failure.

However, aside from this criterion, this project delivered a product that fulfills the requirements that were set by EMSA. It is a product that provides a benefit towards users with certainty and awareness. The product changes the current scenario into a more preferable scenario for the user as well as the environment. This created value translates towards the EMSA food storage units and enhances its functionality and position in the market. The current state of this product is however not yet matured enough. Therefore, the product requires further development, and continuing where this project left off.

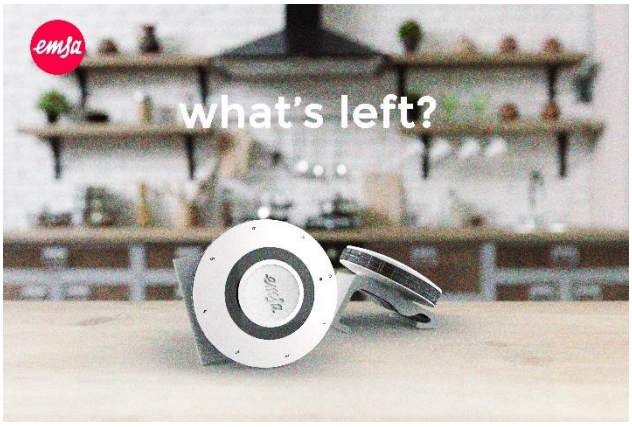

figure 2

figure 3

References

Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R., & Meybeck, A. (2011). Global food losses and food waste: Extent, causes and prevention. *Food and Agriculture Organization of the United Nations*. Retrieved from http://www.fao.org/docrep/014/mb060e/mb060e00.pdf