Prototyping by Proxy

Summary

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Robotically-assisted surgeries are a relatively new way of performing surgeries at the Department of Urology, Aalborg Hospital. While robotically-assisted surgeries give better quality surgeries, they take longer time to conduct than traditional surgeries. Therefore the department would like to speed up the surgeries to diminish this issue. To help them attain this goal we discovered, matured, and evaluated different ideas for collecting data from surgeries. Data that should later be used for analysing e.g. efficiency and quality of surgeries, or be used for educational purposes.

Our development process was based on the Essence framework to enhance the overall innovativeness on the team. To further enhance this process, we incorporated prototyping as the central artefact for exploring the problem space. Traditionally, software prototypes are used as a tool for identifying and evaluating requirements, for which they are very effective. But as we show during in this project, their real strength lies within their capabilities of enhancing the way in which we, as designers, organically and evolutionarily learn, discover, generate and refine designs. Looking at a problem through a prototype manifesting ideas, each individual makes his personal relations to it, sees the problem space in a new light, and possibly comes up with new ideas, be it changes, improvement or inconveniences to what the prototype tries to solve or promote.

Furthermore, prototypes enhance the overall communication on the team. A prototype acts as a point of origin for the discussion around it, and if designed correctly the designer can guide the discussion around parts of the idea for which the designer wants feedback on. The prototype acts as a *boundary object*, ensuring that the team, customers and users understand each other. Something that is difficult with more formal presentations such as documents and diagrams.

We introduce the concepts of a *Surrogate Challenger* and *Surrogate Users* as proxy users to support the development process when the customer is not able to supply neither an on-site customer nor tests subjects. The Surrogate Challenger act as an on-site customer who is able to participate on-site in daily discussions and evaluations when the real on-site customer is unavailable.

The Surrogate Users acts as test subjects who are able to participate in frequents and simple tests of developed prototypes. To somewhat minimize the gap of knowledge between the Surrogate Users and real users, we introduce the concept of mapping problems from one domain to another. We show how we are able to map a problem of the surgeon during surgeries to a problem solvable by the Surrogate Users during tests.