

Thesis Project Portfolio

Designing an Automated Ticketing Service for Improved Efficiency and Usability

(Technical Report)

Banning Period Plastics: The Power of Informed Choice

(STS Research Paper)

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Table of Contents

Sociotechnical Synthesis

Designing an Automated Ticketing Service for Improved Efficiency and Usability

Banning Period Plastics: The Power of Informed Choice

Prospectus

Sociotechnical Synthesis

When designing tools and technology, user satisfaction is a core goal. A solution to a problem is useless if a user does not know how to use it. Designing usable products is central to both engineering and business. Intuitively, involving users during product development would result in greater satisfaction. Research in design processes supports this idea, concluding that user-centered design leads to improved products. Thus, understanding how to optimally include users in design is crucial to producing the highest quality products.

In software engineering, eliciting requirements from end-users is an essential step in the development process. Requirements elicitation can involve surveys, interviews, focus groups, or other strategies. This process' primary goal is to determine the needs and workflows of future users and other stakeholders. User involvement typically continues past this stage as well. Many software projects undergo a beta-testing phase when the product is released to a small group of sample users. Beta-testing allows developers to simulate a production environment on a smaller, more controlled scale while receiving comprehensive feedback from real users.

In the software industry, there are several different strategies with respect to involving users in the development process. Many software development teams employ the Agile development methodology, which relies heavily on consistent user feedback throughout the development process. Using the Agile approach, software development teams will elicit user feedback on project progress at set intervals called sprints. Sprints will typically last two weeks but generally range from one to four weeks. At these points, developers review progress with users and may prepare a prototype for users to interact with. User input determines the direction that development will take and helps to ensure user satisfaction even at the early stages of development. Using this process, user feedback directly shapes the end product.

The technical project studies the benefits of user-centered design when applied to software development in the industry. The research follows an Agile software development project that improves an older system based on user feedback. The project modernized an automated ticketing service for improved efficiency, maintainability, and usability. Throughout the process, I worked closely with end-users, a customer service team, to determine the expectations for the service's functionality. These changes better support customer service representatives that respond to tickets as well as improve the maintainability of the service itself for future developers. The project provides insight into how user feedback can lead to improved functionality, particularly in software maintenance.

This user-centered approach can also make waves outside of engineering. Product designs influence people's everyday lives and decisions. Collectively, products can drive entire economies and societies. As such, this user-centered approach can also be applied to solving social problems.

The sociotechnical research explores how working directly with users can affect a social movement. The research studies the End Period Plastics movement, a campaign in the UK working to eliminate single-use plastics in menstrual products. Thus far, four major companies — Sainsbury's, Aldi, Superdrug, and Lil-Lets — have removed plastics in their period products. Other companies have also responded by launching eco-friendly product lines. Studying how activists have achieved such changes provides insight into the interplay between individual users and the menstrual product industry.

The End Period Plastics movement initiates change from a personal level, namely individual choices in menstrual products. Activists themselves generally are users of menstrual products and work directly with other women to promote their message. The movement differs

from typical sustainability campaigns due to menstruation's personal nature, garnering widespread support from women who use the menstrual products that they fight for. Activists also meet directly with company representatives, opening a dialogue between product designers and users. When redesigning or introducing new products, these companies have made effort to listen to their users' demands. In addition to environmental benefits, sustainable menstrual products are typically more convenient and easier for women to use than conventional alternatives. By working directly with users, companies can improve product designs in a way that benefits all parties involved. The movement's success provides insight into how other movements in sustainability and social justice can succeed in their agendas.

By studying user-centered approaches in two very different contexts, this research illustrates the strategies' widespread possible applications and overall impact. Understanding the impact of user involvement allows designers and engineers to build better solutions, which can have significant impacts throughout societies and economies.