
SIMI - A smart apron for the modern woman

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Abstract

This article is a critical design paper offering a diegetic prototype intended to reflect gender-related norms and expectations of women in the kitchen space. This design aims to provoke thought about the role that kitchen and technology play in preserving gender inequality.

To raise this topic to awareness, we used design fiction as a method and presented an extreme image of women's conservative role as the primary caregiver. The article describes the research and design process of a smart apron —SIMI— that "empowers" modern women in the kitchen. Through the provocative design of SIMI, we also question the ethical and sociocultural responsibility that accompanies the design of new kitchen technologies, which are often overlooked. Our main goal is to emphasize to designers the power and potential technology holds as a tool for catalyzing change and bridging gender inequality in the kitchen.

Author Keywords

Design fiction; future scenario; smart homes; internet of things; wearable technologies; critical Design

Introduction

Gender-related norms and stereotypes

Even though women have made progress and reached success in a variety of fields, in the kitchen space, women's conservative role as the primary caregiver has remained the same.

Over the past 50 years, American women have increased the amount of time they spend in paid work, and men have taken on more obligations at home. However, on average, U.S. women spend fewer hours in paid work than men, which may partially explain the gender imbalance in time spent on food prep and grocery shopping [1]. According to Pew Research Center [1], in U.S. households consisting of married parents with children under the age of 18, 80% of mothers argue they are the primary household member who usually handles both meals prep and grocery shopping. Additionally, mothers spend an average of 68 minutes per day on food preparation, compared to 23 minutes for fathers. According to recent research from Plan International Canada [2], 70% of women have experienced some form of inequality in their lifetime, 73% of women believe society expects them to be wives and mothers, 81% of respondents believe that women are expected to bear the responsibility of domestic work (cooking, cleaning and caring for children). These results amplify the fact that gender-related norms, values, and stereotypes still pose potent barriers to women achieving equal power.



Figure 1: Electrolux expands Google Assistant capabilities

The evolution of the kitchen space

The kitchen space has long been culturally associated with women. Historically, the kitchen was occupied by working-class women, either as maids or cooks or in their kitchens [7]. The kitchen was at the rear of the house, out of public view; gendered labor concealed from the rest of society. The kitchen was transformed from a space of production to an efficient and functional space of consumption, with the evolution of the modern kitchen design in the twentieth century [7]. The internet of things (IoT) connects smart home systems and devices that often operate together, sharing consumer usage data among themselves and automating actions based on the homeowners' preferences. Smart home technology provides homeowners security, comfort, convenience, and energy efficiency through a smart home app or other networked devices.

Recent technological advancements have also upgraded the kitchen work experience. Such example is Electrolux (figure 1)[6], one of the global leaders in kitchen appliances. Electrolux is expanding its collaboration with Google by integrating connected kitchen products with the Google Assistant, enabling consumers to control products using voice commands, turning the interaction with them more intuitive. Over the last century, kitchens have undergone a variety of substantial changes in layout, design, use, purpose, materials, and technologies. The kitchen can be viewed as a site in which generic transformations in work, leisure, and the gendered roles of men and women are given expression [8]. Another interesting aspect of the kitchen space is the dual role in its relation to women [9]. On the one hand - as the 'symbolic heart of the home', where a woman can perform her cultural role of feeding and taking care of her family, her "kingdom." On the other hand - as a site of domestic oppression for women, a socio-cultural "prison" maintains the old perception of women's gender roles.



Figure 2: Donna Reed as the quintessential American housewife wearing an apron

The apron

One of the most prominent symbols of the kitchen, which has not changed significantly over the years, is the apron. Originated from the French word 'naperon' meaning a small tablecloth, aprons have been worn at the front of the body, since ancient times, for practical, decorative, as well as ritualistic purposes. The apron has long been a symbol of kindness and hospitality, and have come to be mostly associated with women and "woman's work".

Women are shown wearing aprons to depict warmth, homeliness, sentiment, and generosity (figure 2). Throughout the ages, aprons became a fashion statement and were attractive and embellished with decorations. Aprons also represent the rank or a group affiliation of the wearer and have appeared as cultural icons. In the late 1960s, when the idealization of housework fell out of favor, aprons were suddenly viewed as old fashioned garments. The very idea of being a housewife seemed dull as women reached outside the home for satisfaction and reward. However, in recent years, the lowly apron has made a comeback due to several cultural factors, including the "back to the kitchen" movement. The increased popularity of cooking, stimulated by cooking shows on prime TV as well as a new appreciation for homemade quality meals, have brought aprons back. An interest in retro fashions and the vintage look has induced young women to take an interest in old fashioned style aprons. Fashionable boutiques even offer today handsomely made aprons, created out of unique fabrics and decorations (figure 3). They are back in vogue, convenient, and retro-chic.

While the kitchen has gone through modernization and digitation, the apron "froze in time" and has kept its sole old fashioned practical function. This gap creates an opportunity to redesign the apron and turn it into an updated, technology-induced kitchen accessory - charged with a critical view of the kitchen as a preserver of gender inequality. The aim of this work and design proposal of SIMI - a smart modern apron -



Figure 3: Fashionable boutiques like Anthropologie offer handsomely made aprons



Figure 4: Robotic Spider Dress

is to intrigue the reader, and to raise the following questions for debate: (1) How to redesign the kitchen as an alternative space that challenges gender stereotypes?; (2) How can new kitchen technologies be designed to empower women and promote gender equality?; (3) Does women's domestic work gives them power in the family or preserves their subordinate gender role?; (4) Do women have any responsibility in preserving the cultural construction of gender roles?.

Related Work

The role technology plays in our lives is rapidly growing, as we become increasingly dependent on it and less willing to separate ourselves from it. The rise of wearable technology, from fitness trackers and the Apple Watch to smart glasses and smart clothes, has been fueled by technology's tendency to get faster and useful at the same time. Technologies designed for women often rely on gender stereotypes in their design, which, on one way or another, perpetuates gender inequality. The following examples set out products which were designed by the same old perception of gender roles, supporting our vision. Peripherii [3] has developed wire-free, hands-free smart fashionable earrings that can take and make calls, connect to Siri/Google smart assistants, and more. Bellabeat develops women's smart accessories for wellness tracking. One of these products is Leaf Urban [4], a versatile piece of smart jewelry that tracks activity, sleep, stress, meditation and reproductive health. The companion app also offers features including lifestyle habits management, period tracker, and fertility calendar. Both of these smart accessories designed for women, present concepts that preserve some form of gender stereotypes in/under the cover of innovation and attractiveness. These products assume women will tend to prefer a technology which resembles a fashionable accessory.

Another interesting example is the "Spider dress", designed by Anouk, which produces smart clothing to function as an intelligent second skin. The Spider dress

is a 3D printed robotic dress, aimed at defending the wearer's personal space. The dress is equipped with an Intel Edison chip that reads biosignals and moveable arms to create a more defined boundary of personal space. However, it is hard to ignore the ambivalent feelings this design evokes. The premise that women need help in defining their personal space and protection against intruders - is gender-biased. Why does a woman need more protection than a man? Is the personal space of a man also at risk? The Spider dress provides a practical solution for a bigger problem that needs to be addressed. Therefore, gendered technologies need to be conscious of the social context and the impact the design may have on society.

Speculative Proposal

Throughout history, aprons have always reflected the prevailing social norms, values and perceptions. Therefore, we chose to design an apron that represents our critique of the gender inequality that is still prevalent nowadays in all sorts of places - the most prominent and complex of which is the kitchen. SIMI is a smart apron designed for modern women to support efficient and successful "kitchen work" using advanced technologies (figure 5). SIMI connects by Wifi to the smart kitchen appliances and enables the woman to control them by voice commands. SIMI also connects to a dedicated app - mySIMI (figure 6) - that can be shared with the whole family, keeping them involved and engaged in meal preparations. SIMI enhances a woman's cooking experience by: helping to manage kitchen inventory (order missing products with a click of a button in the app); offering interactive cooking tutorials projected in front of the apron as well as custom recipes for the family needs on the app (based on their preferences and previous feedback); helping to keep track of her cooking with a real-time cooking status display on the apron. Moreover, SIMI "empowers" woman's role as mother and wife by: sending vibrating alerts to let her know when family members are hungry and on their way

home to eat; collecting family members' ratings of her cooking; and sharing her kitchen-success stories to brag and be inspired by other mothers of the SIMI community.

Using voice integration, visual display, interactive projection, haptic feedback, and customized settings that can be modified via the mySIMI app - SIMI significantly upgrades the overall kitchen-work experience. It improves cooking skills, saves time, simplifies everyday tasks, and enables every woman to shine while performing her conservative role as a mother and wife. The apron comes with a rack that allows wireless charging of the apron while being hung. The technological elements attached to the apron can be easily detached so that the apron can be regularly washed into the washing machine.

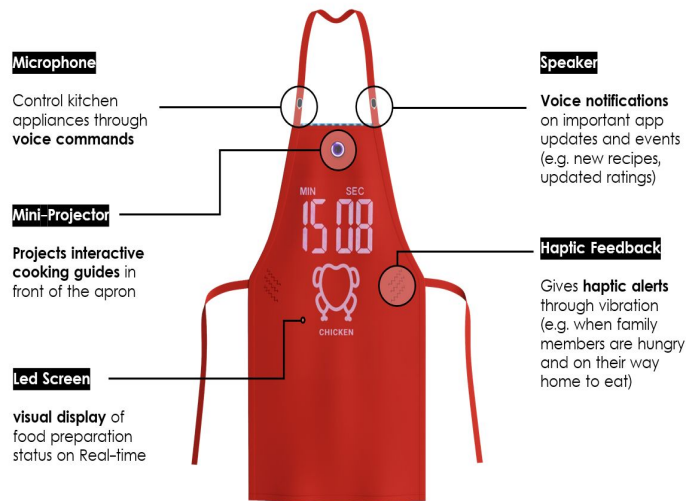


Figure 5: All functionality components of SIMI are shown in the sketch including sensors, feedback mechanisms and outputs.

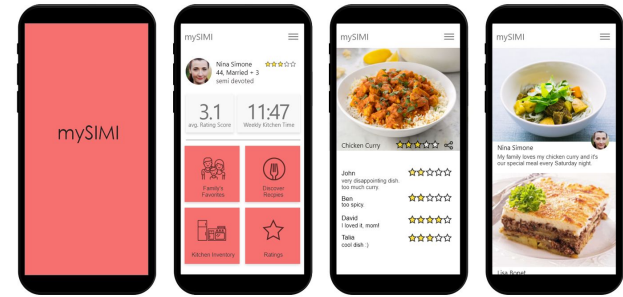


Figure 6: Wireframes of mySIMI app showing main use cases of the app. From left to right: home screen, family ratings, SIMI community feed to share and inspire other mothers.

Discussion

The kitchen plays as a double-edged sword. It is positively attributed to women; it is the heart and center of the home, a welcoming space where a family gets together to dine and celebrate. However, the issue at hand is that the kitchen holds a cultural expectation of women - they need to continue a long-standing norm of managing the kitchen. Thus, limiting their freedom of choice. This design proposal of SIMI and its functionality was intended to take this idea to the extreme. The smart apron aimed to evoke a sense of discomfort that should draw the reader's attention to the prevailing gender-related norms, values, and stereotypes which are expressed in the kitchen space. The minimal design of the apron combined with innovative technology supposed to make the woman who uses it feel as if she is wearing a superhero cape, a sense of feminine empowerment that blurs the grim reality. Under the guise of advanced technology for the modern woman, SIMI aimed at helping successful women to excel in the kitchen, as in other areas of their lives. However, it actually serves as a smart accessory that connects women more tightly to the kitchen space, which, in a sense, keeps its oppressive cultural role.

According to the first law of technology, coined by the American academic Melvin Kranzberg's - "technology is neither inherently good nor bad nor is it neutral" [10]. As a black mirror, technology reflects the problems that exist in society – including the oppression of women. Technology products sometimes reflect a backward view of the role of women. Hence, SIMI was designed as a technological product that reflects gender inequality in domestic work. SIMI also represents the existing technological products' designs that avoid addressing the kitchen's socio-cultural aspect, rather than promoting change. The last three decades have seen increasingly more women in the labor market, but the number of women entering the field of design technology remains disproportionately small. The fast pace of technological development sharply contrasts that of the slow progress towards gender equality. At times when the trend is to advocate for gender equality, nearly all can see that these significant technological changes have been anything but equitable.

Conclusion

Our goal in this paper was to use speculative design to prompt critical reflections on gender inequality and on the broader context of technology design. Not all technologies are designed to make social change, but we believe they have the power to do so. Designers of new technologies should explore and deepen their understanding of the complex spaces, interpersonal relations, and cultural norms for which they design for, such as the kitchen space. Combining user-needs and the socio-cultural context, together with the capabilities that technology offers, can help bridge existing gaps in society, among them is the gender inequality in the kitchen.

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