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Extended Abstract
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Vulnerabilities of Design Strategies for Retaining Emotional Value in Consumer Electronics

Onur Barış Zafer[(a)], Ruth Mugge[(a)], Lise Magnier[(a)]
a) Delft University of Technology, Delft, The Netherlands

Keywords: Emotional Value; Prolonged Use; Early Replacement; Design Strategies; Consumer Electronics.

Introduction

Replacement decisions for consumer electronics involve trade-offs between product values, including emotional value (Van den Berge et al., 2021). Emotional value emerges when a product evokes positive emotions and affective states (Sheth et al., 1991). It can be acquired through diverse mechanisms, including sensory appeal and symbolic associations (Desmet et al., 2001; Orth et al., 2018). Design strategies support designers on how to translate these mechanisms into concrete product features that foster emotional value (Haines-Gadd et al., 2018; Wu et al., 2021). However, design strategies for emotional value are rarely implemented in consumer electronics. One reason may be that emotional value is shaped by individual consumer experiences (Kato, 2021). Thus, design strategies for emotional value may fail if they do not resonate with the user. This makes emotional value less predictable and harder to design for. Additionally, shifting emotions over time may undermine a product's relevance (Chapman, 2009). This may cause products that initially establish emotional value to lose this value gradually. We define these shortcomings that prevent design strategies from creating or retaining emotional value during ownership as *vulnerabilities*.

For example, The Globe is a conceptual clock that replaces time markers with city names tied to a user's experiences (Orth et al., 2018). By evoking nostalgia, it aligns with strategies for fostering emotional value (Haines-Gadd et al., 2018). However, one of the vulnerabilities of this strategy is that it may fail to create emotional value from the outset for this product if the city-based time display does not resonate with a user's expectations of a clock, potentially preventing product acquisition. Furthermore, even when it initially fosters emotional value, nostalgia may turn into frustration due to the product's impracticality for daily timekeeping.

This study contributes to the literature by examining how and why design strategies for emotional value become vulnerable despite their initial promise, making products designed with these strategies susceptible to early replacement. By understanding and tackling these vulnerabilities, we can help products retain emotional value over time.

Methodology

Ethical approval was obtained before data collection. Semi-structured interviews were conducted with ten professionals in the consumer electronics industry, with ten more planned. Each interview lasted about an hour and was preceded by a 15-minute sensitizing activity. The sample included product and user experience designers, design researchers, and design managers. This purposive sampling (Palinkas et al., 2015) ensured a comprehensive exploration of design strategies and their vulnerabilities.

The sensitizing activity introduced Emotional Durability Design Nine (Haines-Gadd et al., 2018), a tool for incorporating emotional value into new product development. This aligned the tool with the participants' expertise and laid the study's foundation. Participants explored nine product examples (Figure 1), including conceptual cases (e.g., Standard Lamp (Casais et al., 2018)) and market products (e.g., Phillips Hue). Non-electronics examples were included to provoke reflection on adapting these strategies for consumer electronics. Each card detailed how the product fostered emotional value, enabling participants to evaluate the design strategy's effectiveness over time.

During the activity, participants selected three cards, matched them with the relevant design strategy themes, and assessed the product's potential to retain emotional value over time. They then placed the cards on a product ownership timeline (Shi et al., 2022), from pre-acquisition to pre-disposal. This activity contextualized when emotional value might diminish and prompted reflections on the causes.

Interviews expanded on the activity. Participants reflected on why the emotional value of the selected products might diminish over time and suggested ways to retain it. They also shared professional insights on industry challenges, including why many design strategies struggle to transition to market-ready products. The responses were thematically analyzed using inductive coding (Braun & Clarke, 2006).

Preliminary Findings

Preliminary findings reveal five key vulnerabilities hindering emotional value retention in consumer electronics. These vulnerabilities highlight the multifaceted challenges design strategies face while prolonging product use.

User-specific Vulnerabilities

Consumers' insufficient pre-purchase awareness of products fostering emotional value limits their acquisition, while limited post-purchase engagement with features supporting emotional value reduces their long-term impact. Additionally, low self-efficacy and motivation in activities that build or later restore emotional value (e.g., personalization, aftercare) further hinder retention, prompting early replacement.

Product-Service System (PSS)-related Vulnerabilities

Poorly integrated digital and physical features and inadequate services (e.g., maintenance, customer support) create fragmented user experiences. These prevent users from fully utilizing features that foster emotional value (e.g., Phillips Hue's features embedded in the app that some users do not utilize), leading to frustration. Over time, this weakens emotional value retention, potentially shortening product use.

Organizational Vulnerabilities

Conflicting departmental goals, time constraints, and overemphasizing technical metrics can hinder the organizational adoption of design strategies for emotional value. Underinvestment in long-term support systems (e.g., software or hardware upgrades) undermines emotional value retention, risking its decline in later ownership stages and prompting early replacement.

Technical Vulnerabilities

Technical barriers can hinder the implementation of design strategies, often leading to poor execution. For example, one vulnerability of the evolvability strategy can be its dependence on modular technologies, which may restrict design flexibility. Consequently, products may fail to realize their full potential,

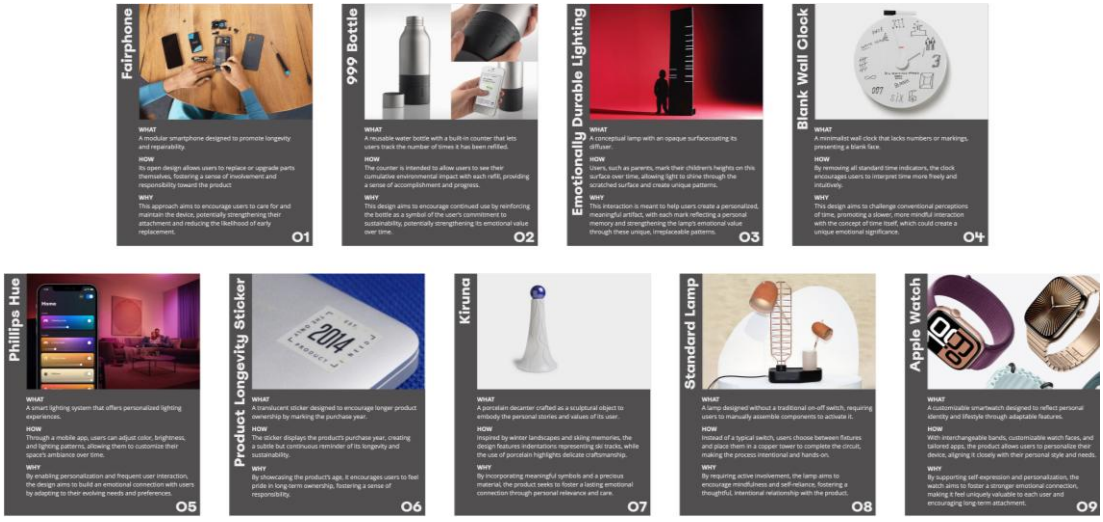

Figure 1. Design example cards used in the sensitizing activity.

reducing the strategy's likelihood of fostering emotional value and increasing the risk of early replacement.

Market-driven Vulnerabilities

Profit-driven business models misalign with design strategies for prolonged use, favoring market and technological trends that encourage early replacement. By overemphasizing new features, they overshadow the emotional value of owned products, making them feel outdated. This undermines design strategies' capacity to withstand external pressures and help products retain emotional value over time.

Conclusion

This study addresses a gap in design literature by examining the vulnerabilities of design strategies for retaining emotional value in consumer electronics. Identifying vulnerabilities advances the understanding of emotional durability in consumer electronics and how design can better accommodate shifting consumer emotions over time. The findings offer valuable insights for design practitioners and researchers to retain emotional value and counter early product replacement. Ongoing analysis will explore opportunities to address these vulnerabilities, supporting sustainable design practices that prolong product use and reduce e-waste.

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