

Driving Sustainable Behavior with Persuasive Technology

The Green Consumption Assistant

E-commerce is here to stay. And it has become very successful in driving unsustainable behaviors such as overconsumption. How could the same technology be used to guide consumers towards sustainable product choices?

By Maïke Gossen and Patricia Jankowski

Digitalization has prompted the development of websites and apps which are motivating people to act in favorable ways. Fogg (2002) coined such technology designed to change attitudes and behaviors *persuasive technology*. Assuming that these developments could also encourage sustainable behavior, Ecosia launched the browser extension *Green Consumption Assistant (GCA)* aiding sustainable decisions in online-shopping with recommendations for best-in-class products and advice for sustainable consumption.

User research on the first iterations of the GCA proves a general interest in sustainable product recommendations and information while shopping online. Meanwhile, low interaction and click-through rates call for system design improvements. In this article, we therefore

identify its persuasive design elements to help refine the system and assess its efficacy for behavior change. The evaluation is operationalized by the Persuasive System Design (PSD) model (Oinas-Kukkonen and Harjumaa 2009), which specifies persuasive key elements of a system.

The PSD Model

Following Sunio and Schmöcker (2017), we consider four categories of persuasive system features: *Primary task support*, *dialogue support*, *system credibility support* and *social support*. *Primary task support* assists users in performing a target behavior using elements such as reduction, tunneling, tailoring, personalization, self-monitoring, simulation or rehearsal. *Dialogue support* facilitates the

interaction between users and the system, thus motivating them to use it and achieve the target behavior, for example by praise, rewards, reminders, suggestion, similarity, liking or social role. On another level, the *system credibility support* increases the authenticity and reliance of the system. Its principles include trustworthiness, expertise, surface credibility, real-world feel, authority, third party endorsements and verifiability. Finally, *social support* motivates users by leveraging social influence through e.g., social learning, social comparison, normative influence, social facilitation, cooperation, competition and recognition.

Persuasive System Elements of the Green Consumption Assistant

The GCA recognizes purchasing intentions and displays recommendations in the form of sustainable best-in-class products (reduction, tailoring, rehearsal). It then guides users to shops where the product can be purchased (tunneling). Additionally, the pop-up carousel offers second-hand and repair options as well as an affiliate link monetizing purchases in order to plant trees (suggestion), which are reinforced by sustainability information (simulation, normative influence). The interface is illustrated by a koala with positive facial expressions (social role, liking) and a feedback-button connecting users to the developers (real-world feel).

Products are considered as best-in-class when more sustainably produced than others in their product category and are usually certified by at least one institution (surface credibility). The assessment of trustworthiness and social and ecological attributes of their labels follows that of the reputable rating initiatives “Siegelklarheit” and “Project CECE” (expertise, trustworthiness).

Overall, the GCA includes many elements constituting a persuasive system with a focus on primary task and system credibility support features with five and four principles respectively. Further, the analysis revealed that the extension only

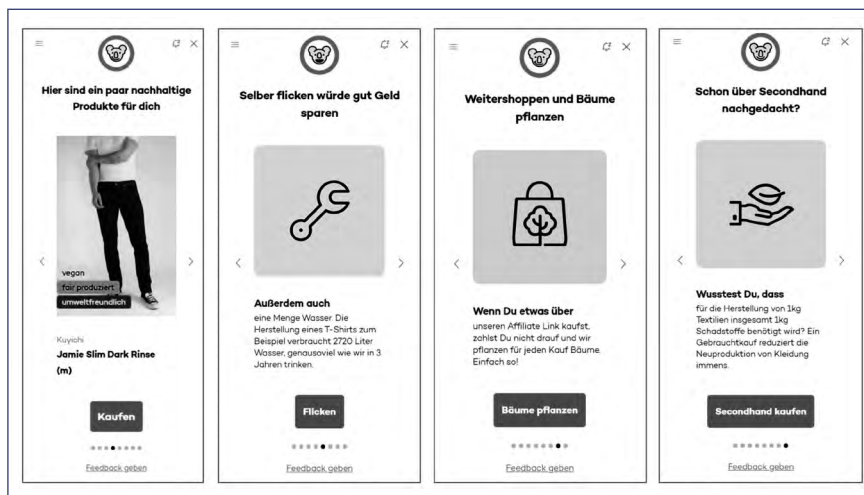


Figure 1: Exemplary best-in-class, repair, compensation and second-hand recommendations based on a search for “jeans”

meets three dialogue support principles and one social support principle.

Promoting sustainable behavior change

In this review, we examined the persuasiveness of Ecosia's Green Consumption Assistant using the PSD model. We found, that task and system credibility support principles are already met and used to form an implementation intention, which is greatly facilitated by providing an appropriate alternative purchase suggestion with its corresponding environmental and social benefits. However, dialogue and social support features are underutilized, leaving their potential to motivate behavior change untapped. Following findings from Adib and Orji (2021), we suggest integrating further principles used in e-commerce such as social learning and rewards, which could improve interaction rates and the GCA's persuasive effect to promote sustainable purchase behavior. Click-through rates may be boosted by cutting the options to only best-in-class or second-hand products, thus diminishing the current complexity of the carousel and increasing its reductive quality.

Conclusion

To select impactful system features and principles, we propose conducting further user research to identify and investigate (possible roots for) unsustainable behavior. This can be inspired by methods of user-centered design (Daae/Boks 2015) and the emerging body of literature on Design for Sustainable Behaviour (DfSB), which aims to reduce products' environmental and social impact by moderating how users interact with them (Bhamra et al. 2011).

In implying that the GCA be utilized as a medium of intervention for promoting sustainable behavior change, a considerable limitation must be mentioned. Our user research suggests that users' reservations concerning the effort of installing and maintaining browser extensions may hinder the GCA's scalability.

With the benefits of reaching broader user groups in mind, we thus recommend integrating features of the GCA directly into the Ecosia search site.

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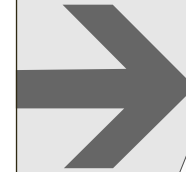
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