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Product Experience Wall: A Context-adaptive Outfit Recommender System

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Abstract

This paper presents research in progress and describes the concept and prototype of the so called "Product Experience Wall", an interactive and context-adaptive outfit recommendation system for retail fashion stores. The goal is to design an experiential system that serves both, functional and hedonic needs. Context adaption allows pro-actively approaching the user and recommending products based on the respective user context. Next to face detection algorithms, we use RFID sensors and interfaces to external data sources (e.g., weather information) to create a unique customer experience. This experience is furthermore supported by displaying product combinations on virtual, life-size avatars. The core functionality of the concept is based on the findings of qualitative interviews performed amongst 6 experts and 80 customers.

1 Introduction

Supported by the technological change, the use of self-service systems at the point of sale is considered being able to impinge upon the perceived value and quality of services (Verhoef et al. 2009, 31-41). It has already been proven that technology can make stores more interesting, trustworthy and attractive, thus affecting the brand's perception and image (Pantano & Naccarato 2010, 200-204). The provision of experiential, value-added services is regarded an appropriate means to differentiate from competitors (Merkle & Kreutzer 2008, 21). However, while general design principles for self-service systems have been assessed and communicated in the past (Magurie 1999, 263-286), practitioners often still neglect basic psychological aspects when developing self-service systems, especially the ones regarding usability, user experience, and joy of use.

Using the example of the textile industry, this paper presents a newly developed system that uses context adaptivity (Soylu et al. 2009, 992-1013) not only to support the users in their shopping task, but to also create a positive overall experience. Using sensor technology and third party data, the goal is to start a context-based and system-initiated interaction in order to realize an interactive outfit recommendation system. The service encounter therefore is personified by using a digital avatar. Focus on the experiential dimensions by Schmitt and

Mangold (2004) during development furthermore supports the delivery of emotional and functional value to the user. Figure 1 visualizes the vision of the final realization.

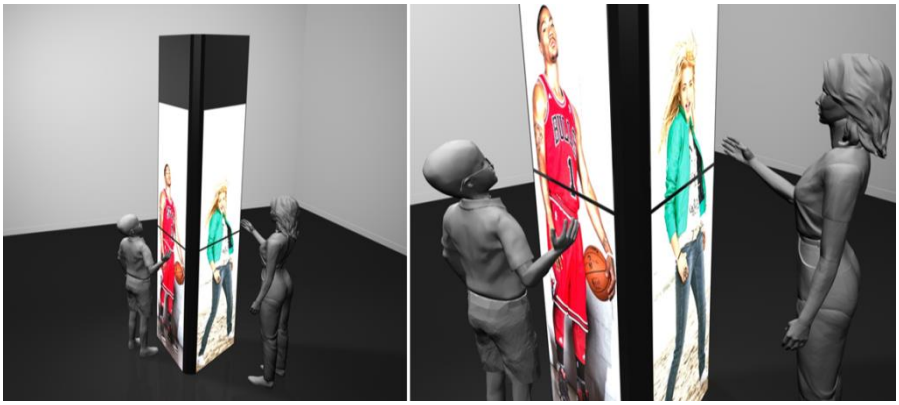

Figure 1: Product Experience Wall Concept

Based on 6 expert interviews and a qualitative study (semi-structured interview) performed amongst 80 customers (38 female, 42 male, aged 14 to 32) of retail fashion stores, aspects affecting the satisfaction in regards to utilitarian and emotional values during shopping were identified. Next to the fact that basically all fashion stores seem to offer the same experience, three main categories for improvement through technology were identified: products should be presented as outfit combinations, not individually (62 mentions), store staff is often not present or is not well informed (53 mentions), and missing product information (75 mentions). These aspects provide the foundation for the concept and prototype presented.

2 Prototype and Interaction Concept

The presented system implements context adaptivity by using several sensors and interfaces to external data: an RFID system allows the detection of products taken in front of the terminal and connecting to open source weather information services enables weather-based product recommendations. Nevertheless the core of the interaction is realized through a face detection engine that recognizes gender, age, and mood of the user or user group approaching the device. This approach allows the automatic adoption of the user interface by applying personalized content (e.g., colors). Next to adapting the product offers based on the gender, age, or mood detected, the sensors can also act as a trigger for a system-initiated interaction with the user. In our concept this happens through a life-size digital avatar representing a virtual store assistant. With this approach, a more personal, individual, and human-like interaction with the self-service system can be realized. As soon as a person approaches the system and his/her face is detected, the system initiates a conversation. Next to an automatic filtering of the products presented (e.g., based on gender), the facial features

are used to steer the conversation and trigger an optimized interaction, thus making the interaction natural and immersive. The virtual store assistant is currently realized through short video clips which are either triggered through the sensors or through interaction of the user. While the avatar in the first case acts as a digital contact person, it can also be dressed up and used to present outfit combinations.

Predominant literature on face detection algorithms mainly focuses on verifying the identity of persons in the context of biometric identification (Huang et al. 2001, 617-638). Little research has been conducted so far on applying the technology outside the area of biometrics or security. The use for marketing purposes or human-computer interaction (HCI) seems to be promising, but concrete practical examples hardly exist. Focusing on the creation of positive customer experiences by addressing utilitarian (e.g., pre-filtering of the products) as well as emotional factors (e.g., system-initiated interaction), the concept is realized using the Fraunhofer SHORE SDK[1] (Kueblbeck & Ernst 2006, 564-572). The prototype as well as the UI are shown in Figure 2. A projector displays the image on a large acrylic-glass back-projection wall, equipped with a capacitive multi-touch foil. The size of the wall allows displaying human avatars in real-life size. All sensors are mounted behind the glass, realizing an unobtrusive representation of the technology. In order to achieve a high detection rate of the RFID tags, multiple antennas are mounted in different angles.

Figure 2: Prototypic Implementation (left: prototype construction, right: user interface with digital avatar

3 Conclusions and Outlook

First user tests show that both, the context-adaptivity as well as the real-life size avatar provide enormous potential for creating experiences. As the context adaption happens on a subconscious level, users get surprised if they received individualized content without having

[1] For additional information also see http://www.iis.fraunhofer.de/de/bf/bsy/fue/isyst.html.

to tell the system their needs. Further evaluations will provide a deeper insight into the utilitarian and emotional effects. Special emphasis will be put on the aspects of flow and immersion occurring through this new interaction concept. Next to finalizing the system as described above, additional functionality is planned. By applying image processing technologies, product recommendations will be given based on skin tone or hair color of the customer. The camera can furthermore be used to detect the heart rate of the user (Poh et al. 2010), allowing to draw inferences on emotions arising through interacting with the device or the products recommended. Furthermore, the outfit combinations will be visualized on the customer's personal avatar previously captured through a body scanner. In contrast to an augmented reality application, this also allows a more realistic visualization of drape and fit of the garment. Finally, using an animated avatar instead of linked video clips allows more flexibility in regards to product presentation and interaction. This provides additional functionality and positively influences the perception of the products (Suh et al. 2011).

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