A Needs Assessment for an Apparel Augmented Reality Application

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Background and Research Purpose. Augmented reality (AR) is an interactive technology that integrates computer-generated sensory information to a physical environment in real time (Lee, 2012). AR systems sense users' gestures such as hand motions and allow users to navigate through a library of product images to make selections (Carmigniani et al., 2011). Current AR applications for the apparel industry are developed for websites, mobile, or in-store kiosk use for customers to virtually try on clothing and accessories. Consumers can see two-dimensional front and back views of garments to evaluate fit and constructional details of garments (Carmigniani et al., 2011). Major apparel retailers such as Nordstrom, Ralph Lauren, Bloomingdale's, and Topshop have been testing AR's potential for in-store shopping (Davies, 2015). Since designing such technology requires large amount of investment; developers need to create better fitting applications that can eventually reduce consumers' regret caused by post-purchase expectation-reality discrepancy. Therefore, the purpose of the present study was to understand how consumers would use an AR application to make decisions, and their preferences concerning the usability of the AR technology.

Method. We conducted a qualitative study and interviewed with 17 female and three male participants who visited our lab at a Midwestern University. Before interacting with the AR application, participants answered several questions about their age, online shopping frequency, technology anxiety (adapted from Meuter, Ostrom, Bitner, & Roundtree, 2003), and experiment with appearance (adapted from Fiore, Lee & Kunz, 2004). Then, participants stood in front of the computer screen with a built-in video camera to be able to see their bodies, and used the AR application for selecting and trying on various virtual garments (e.g., tops, shirts and dresses). After interacting with the application, structured interviews were performed for an hour to obtain in-depth information. Interviews were audio-recorded and transcribed verbatim; and then coded in QSR NVivo 10 by both researchers after establishing a .96 inter-coder reliability. Categories and emerging themes were identified during final data analysis.

Results and Discussions. On average, participants were 24 years old (SD=5.86). On a 7-point scale with endpoints *strongly disagree* (1) and *strongly agree* (7); females and males had a high technology confidence, (M=6.12, SD=.99), and (M=7.00, SD= .00) respectively. Overall, female participants liked experimenting with appearance (M=5.50, SD= 1.10) more than males did (M=2.33, SD= 1.89). Participants' online shopping frequency mostly varied between once a month (n=10) to once a week (n=6). Qualitative data themes were grouped around *Usability* of the application and recommendations (control buttons, scaling, interface, picture-taking); *Usefulness* (fit, sizing, online shopping); *Garment attributes* (length, silhouette, colors,

materials), and *Psychological reactions* (curiosity; surprise, confusion, excitement) to the AR application. The application required a learning curve for its controls, which were found to be tiring by some participants. Participants agreed that AR technology has a marketing advantage that can help consumers visualize garments on their bodies. For females, such applications would be useful when a consumer had an idea from past experiences about which silhouettes typically work for her body shape. Females paid more attention to garment details whereas males were focusing on the entertainment value as well as technical features of the application, and did not care about garment fit. Garment sizes on the application were not found to be accurate. Majority of the participants needed more written information in regards to sizing and fabric.

   Conclusions and Implications. The purpose of this study was to understand the reactions of consumers to an online AR application that presented an opportunity to try-on virtual garments on users' bodies reflected on a computer screen. Participants' interactions with and expectations from the AR technology were analyzed through in-depth interviews. Overall, female participants had concerns in the presentation of the garments and the fitting issues. Our findings indicated that apparel AR technology providers should present female consumers an option to adjust garment sizes properly and include detailed written descriptions in their application. Male participants were attracted to the entertaining features of the application. The results of the study can assist technology developers in building better applications for apparel consumers.

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