

Immersive Technologies for Interactive Store Design

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INTRODUCTION

While the current advances in Information and Communication Technologies offer a huge number of innovative systems able to enhance the traditional points of sale (Evans, 2011), consumers expect the introduction of more technology-based innovations in the stores especially to save time (Pantano & Viassone, 2012). As a consequence, also retail-oriented firms are forced to innovate to maintain business profitability.

In recent years, retailers have introduced several innovations in the traditional stores with a different level of diffusion and acceptance. In particular, the innovations currently adopted modify the modalities of (i) displaying items, by offering screens that exploit virtual reality techniques for presenting products; (ii) providing information on available items, by offering touch screen displays for achieving customized information on the products; (iii) payment, by offering applications for mobiles that allow consumers to pay the purchases directly from their own mobile (Pantano & Servidio, 2012). Especially the recent improvements in cloud computing and wireless technologies offer new applications and recommendations for consumers who can access everywhere directly from their own mobile phones (i.e. the possibility compare, order and pay items direct from mobiles), as well as the advancements in 3D virtual reality provide a new retail environment for an enriched shopping experience through user-friendly and more realistic consumers' interfaces (Bennet & Savani, 2011; Bourlakis & Papagiannidis, 2009).

As a consequence, the innovative technologies increase the level of uncertainty and elicit several risks, such as the high risk of market failure, due to the possibility to not reach consumers' interest and satisfy their expectations (Kohler et al., 2011; Fanelli & Maddalena, 2012; Zhu et al., 2013). To avoid this problem, it is possible to effectively collaborate with clients according to consumer-centered perspective

for enhancing the innovation process, by considering consumers as a source of ideas, suggestions, creative proposals and involving them as active participants into the entire design process (Fuller et al., 2011; Frohlich & Sarvas, 2011). Since the positive impact of users' creative contributions in design process (Olsson, 2004; Wu & Fang, 2010), the user-centered design perspective is emerging as an efficient strategy for fitting better consumers' requirements and needs, as well as for increasing the likelihood of their acceptance and usage of new products. As a consequence, the increasing attention of market toward consumers instead of products forces firms and organizations to focus more on user-centred design. In the one hand, this approach allows users to feel active part of the design process, with benefits for the final products (Miaskiewicz & Kozar, 2011); in the other it supports firms and organization to better understand and reply to consumers' expectations (Veryzer & Borja de Mozota, 2005). Hence, the design process starts from the users' experience.

Although the importance of users-centred design, the problems concerning to what extent consumers are willing to be involved in the process stages still remain (Aarikka-Stenroos & Jaakkola, 2012), as well as the research in developing new products/services with a high acceptance probability is still in progress. As a consequence, how consumers can be involved and motivated in submitting their creative ideas, and how to support the knowledge sharing between consumers and designers for creating new products and services is still a hot topic for the sector (Fuller et al., 2011).

The aim of this article is to analyse the new trends in retailing based on virtual and augmented reality, with emphasis on the use of the immersive technologies for involving consumers in co-creation experiences and stimulating them in submitting their creative contributions for the development of innovative efficient stores. The research focuses on the main factors that influence this process.

DOI: 10.4018/978-1-4666-5888-2.ch225

Key results synthesize findings from several fields such as computer science, marketing, R&D management, and psychology.

THEORETICAL BACKGROUND

Consumers Involvement in Design Process

Although consumers and designers differ in viewpoints, their collaboration can be effectively channelled into new products (Ramesh & Tiwana, 1999). However, the development of an effective mutual interaction between consumers and designers/managers is still a challenge, due to both designers/managers dependence on customers for defining needs and preferences, and consumers' lack of knowledge of tools and skills for expressing this information (Aarikka-Stenroos & Jaakkola, 2012). Hence, the key elements for a successful innovation process consist of (i) user research, (ii) technology research, (iii) design research, and (iv) business research, by integrating Human-Computer Interaction vision, which is able to enhance the collaboration among the actors involved in the design process (HCI) (Frohlich & Sarvas, 2011; Wright et al., 2006). In fact, the findings emerging from HCI and computer systems research outline the elements able to involve the actors into the artefact design increases the acceptance, the quality, the empowerment, and the convenience, of the final product. Previous studies on new products, developed through a consumer-oriented approach, highlighted the corresponding increasing of benefit and efficiency if compared to those developed with traditional approaches, such as the product-centered one (Veryzer & Borja de Mozota, 2005). A user-centered approach starts from consumers' experience that becomes the *core* of the whole design process (Verganti, 2008). Past studies underlined the importance of human factors for the new research in technology (Jennings et al., 2006). In this scenario, the user-centered approach for design involves consumers in several ways. They are able to actively participate to the process with different functionalities (Pascal et al., in press): (1) informative, by providing information on their experience, needs, and preferences; (2) consultative, by advising and proposing other solutions; (3) participative, by participating to all the stages of the process and to the undertaken decisions. In this case,

they can be considered as co-designers due to their extensive support in all the phases of the design process and their suggestions become critical for the successful for the final product/service. For this reason, soliciting users' participation plays a crucial role (Fuller et al., 2011). As a consequence, accessing to consumers' knowledge supports managers in the development of new customer-centered products and services.

Sanders and Stappers (2008) emphasized that users are motivated to express their ideas on the basis of their interest towards the provided experience, and the amount of effort in the creative proposal process may vary according to their expertise; whereas Greer and Lei (2012) identified that while financial rewards can negatively affect users creativity, non-monetary incentives can enhance individual contributions, such as hedonic benefits including enjoyment and fun. Furthermore, Hoyer et al. (2010) grouped the main motivational factors in (i) financial, (ii) social, (iii) technological, and (iv) psychological. In fact, enjoyment can be a powerful element for involving consumers. Previous studies on entertaining technologies addressed the assessment of perceived fun as motivating factor for involving individuals in several activities and processes (Soderlund & Julander, 2009). It is usually strongly related to the design tools provided for the interaction (Greer & Lei, 2012). As a consequence, the development of an effective environment where users live an engaging co-creation experience represents a key factor for achieving effective creative contributions, in terms of quantity and quality. Other researches on consumer empowerment through Information and Communication Technologies highlighted the relationship among the experience empowerment, the virtual interaction and the corresponding enjoyment, as well as between the experience empowerment and users' creativity, with consequences for their interest in participating in the development of future products (Fuller et al., 2010).

In spite of the great number of research studies already done, some key questions still remain: how to motivate consumers to participate to the process and how to effectively interact with them?

Virtual Tools for Users' Involvement

Users-centered design might be more focused on users' experiences through the exploitation of virtual worlds and immersive environments (Bullinger et al., 2010; Kohler et al., 2011). The importance of these elements,

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