

Magic Home: Exploiting the Duality between the Physical and the Virtual Worlds

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ABSTRACT

In this paper, we present a concept prototype, called *Magic Home*, which illustrates what the shopping experience will be like in the new world of the hybrid reality – a seamless integration of the physical and the virtual worlds. We introduce the concept of *buyer context*, and demonstrate that, by exploiting the portability and manipulability of the virtual world and, at the same time, preserving the immediateness of the physical world, we can bridge the context gaps in shopping and, as a result, achieve a new level of shopping experience.

Keywords

Buyer context, electronic shopping, situated computing, augmented reality.

BACKGROUNDS

In today's world, shopping takes place in two distinct modes: *physical* or *virtual*. For many, going to a department store or a suburban mall is still the fastest way to buy what we need. For others, shopping from online stores is becoming a way of life. In either case, one would wish we could make better purchasing decisions by being able to relate what we already have with what we are about to buy. For example, you go to J. Crew online store to buy a solid suede broadcloth shirt. Wouldn't it be nice if, before purchasing the shirt, you could see how well it goes with the navy blue jacket you bought from The Men's Warehouse six months ago and the Dockers Khakis from J.C. Penny you have had for the last two years? Similarly, when you go to a local furniture store to shop for a couch for your living room, wouldn't it be helpful if you could *preview* the selected couch in the context of your living room to see how well it goes with your existing furnishings before you decide to take it home?

To address these problems, we introduce *Magic Home*, a concept prototype that allows you to take your home with you wherever you go, in effect, *your home in your wallet*. Magic Home provides valuable new services based on this capability.

THE CONCEPT OF "BUYER CONTEXT"

We define *buyer context* as what you already have in your home, as well as other physical constraints related to a particular purchasing decision. In the first example, the existing content of your wardrobe is part of your current buyer context: it suggests as well as constrains what you will be buying in the future. In the case of furniture buying, the buyer context includes not only the existing furnishing but also the spatial dimensions of your living room.

For most of us, our buyer context is physical and, as a result, it is not portable or malleable. For example, you cannot take your living room to the physical furniture store, or match up a jacket from your wardrobe with a shirt from an online store. However, with the increasing availability of electronic representations of physical products [1], and the widespread use of tagging and tracking technologies ranging from barcodes and radio frequency identification (RFID), buyer context will soon become more accessible in the virtual world. As a result, shopping, as we know it, will never be the same.

THE SCENARIO

Todd wants to buy a new couch for his living room. He goes to a local furniture store, taking with him a smart card. Upon entering the store, he approaches a store kiosk, and inserts his smart card. The smart card identifies who Todd Smith is. It also tells the application where on the Internet the content of his virtual home is stored. After retrieving the content, the application creates a corresponding 3-D rendering of the living room. Next, Todd picks up a wireless barcode scanner, and begins to wander around the showroom floor in an attempt to find a nice couch. When he finds one, he scans the barcode. Immediately, the scanned couch appears in his living room on the screen (see Figure 1). Todd places the selected couch at various locations by rearranging his existing furniture. He can compare multiple couches side by side by placing them at the same location in

his living room (see Figure 2). He can even take virtual tour of the room to see how good these couches look with respect to each other from different vintage points.

After all the previewing activities, Todd finally decides to purchase the couch and pays for it using the same smart card. He goes home with the new couch, confident that everything is perfect. At the same time, his virtual home is updated to reflect the new transaction he just made.



Figure 1. In the furniture store, Todd previews a couch from the showroom floor by placing it in his virtual living room.

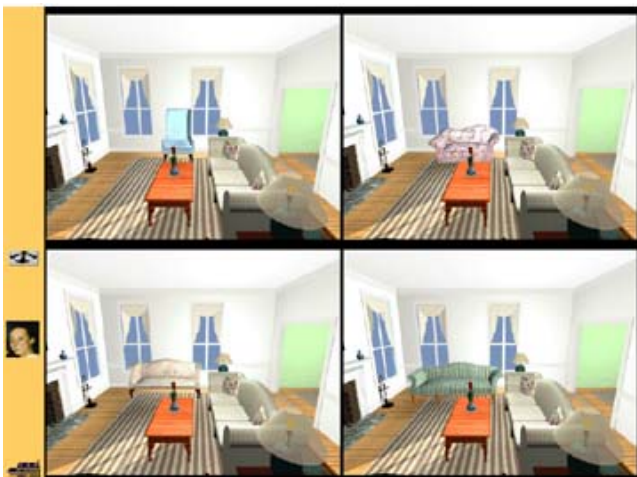


Figure 2. Todd compares the selected couches by placing them in the identical spot in his living room.

Bridging the Context Gaps in Shopping

Underlying the above scenario is a critical assumption: there exists a close coupling between the objects in the physical world and those in the virtual or electronic world. In other words, corresponding to his physical home, Todd has a virtual home that contains every physical product in his home, from Oriental rugs to lamps and chairs. For each physical product like a couch, the corresponding virtual

representation may include the 3-D representation, material, color, style, manufacturer, warranty information, cost, and purchasing date. The 3-D models of homes and furniture are more available than most people think. In fact, with the widespread use of CAD software in the design process, such models are already created as a by-product of creating the physical product. For the first time, the Internet and the Web make it possible for manufacturers to inexpensively distribute, and for the consumers to easily view such content.

The Magic Home prototype makes use of the smart card with a networked cash register to automatically synchronize Todd's virtual home with his physical home. The smart card serves three purposes:

- *Authentication*: it identifies who the cardholder is.
- *Proxy for the virtual home*: it contains the URLs for Todd's virtual home.
- *Payment*. It can be used like a regular credit card.

When Todd uses his smart card to pay for the new couch, the cash register application learns that Todd now has the ownership of the physical couch. Thus, It automatically goes to his virtual home and updates its content to reflect the transaction just completed. As a result, Todd's virtual home is always up-to-date with respect to his physical home. This close and yet seamless synchronicity between Todd's virtual and physical homes makes it possible to bridge the context gap in shopping, as described earlier in the scenario.

CONCLUSIONS

Magic Home is part of an ongoing research program in situated computing at Accenture's Center for Strategic Technology Research (CSTaR). In this program, we attempt to bring together a wide range of sensory, computing, and communications technologies to create new types of consumer experiences. One central theme of our research is to explore ways to bridge the situational gaps in human action by exploiting the duality between the physical world in which we live and the virtual world to which we are becoming increasingly accustomed. Magic Home is a good example of applying situated computing in the context of shopping.

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