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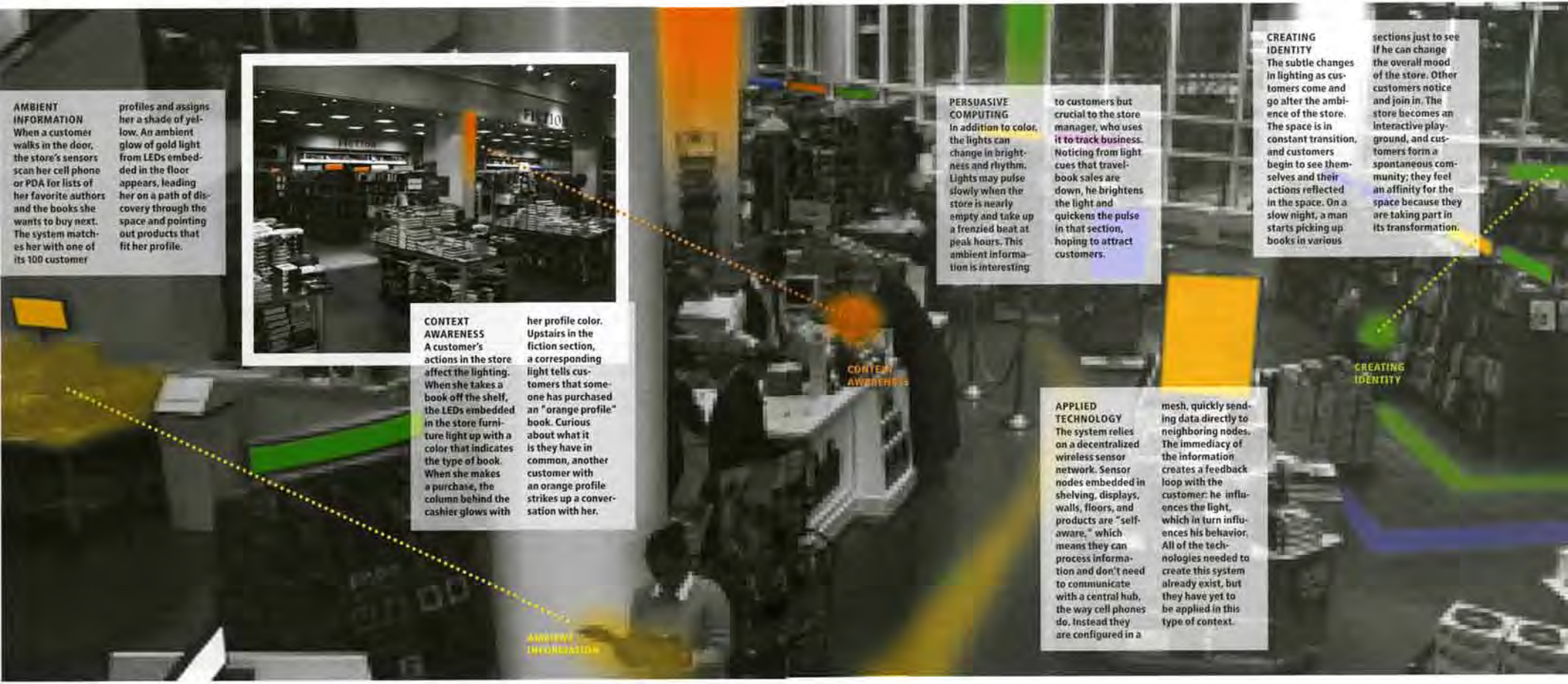
WHAT IF

by **Beatrice Witzgall**

I grew up in the heart of a European city. Every Saturday my grandmother used to go "into the city." For her this meant a stroll down our main shopping mile—the center of retail. She didn't need more clothes; she wanted to be with other people. This is what attracted her to shopping as an activity. As technology has begun to alter our lives and environments, this basic human need for social interaction—even in retail environments—has not changed.

Technology dominates our vision of shopping in the future. In movies like *Minority Report* we have seen how it can determine customer preferences and product availability or display additional information such as prices or alternative products. But technology can also help retailers make their stores more appealing on a human level. The future retail environment might be a responsive system that uses high-tech sensors to map customer behavior and change the physical space accordingly: based on activity within the store, wall panels might move, lights might change color or brightness, and sounds and smells might communicate information.

This proposal envisions a bookstore where a system of wireless sensors and LED lights gives customers personalized information, solidifies their interest in and loyalty to the store, and helps them make connections with one another. Unlike most technological interventions, it engages—and relies on—human curiosity and playfulness. In this vision of the future, technology does not alienate or dehumanize us; instead it enhances the human experience of a retail environment. A store becomes a public place, a platform for social interactions.



AMBIENT INFORMATION
When a customer walks in the door, the store's sensors scan her cell phone or PDA for lists of her favorite authors and the books she wants to buy next. The system matches her with one of its 100 customer profiles and assigns her a shade of yellow. An ambient glow of gold light from LEDs embedded in the floor appears, leading her on a path of discovery through the space and pointing out products that fit her profile.

CONTEXT AWARENESS
A customer's actions in the store affect the lighting. When she takes a book off the shelf, the LEDs embedded in the store furniture light up with a color that indicates the type of book. When she makes a purchase, the column behind the cashier glows with her profile color. Upstairs in the fiction section, a corresponding light tells customers that someone has purchased an "orange profile" book. Curious about what it is they have in common, another customer with an orange profile strikes up a conversation with her.

PERSUASIVE COMPUTING
In addition to color, the lights can change in brightness and rhythm. Lights may pulse slowly when the store is nearly empty and take up a frenzied beat at peak hours. This ambient information is interesting to customers but crucial to the store manager, who uses it to track business. Noticing from light cues that travel-book sales are down, he brightens the light and quickens the pulse in that section, hoping to attract customers.

CREATING IDENTITY
The subtle changes in lighting as customers come and go alter the ambience of the store. The space is in constant transition, and customers begin to see themselves and their actions reflected in the space. On a slow night, a man starts picking up books in various sections just to see if he can change the overall mood of the store. Other customers notice and join in. The store becomes an interactive playground, and customers form a spontaneous community; they feel an affinity for the space because they are taking part in its transformation.

APPLIED TECHNOLOGY
The system relies on a decentralized wireless sensor network. Sensor nodes embedded in shelving, displays, walls, floors, and products are "self-aware," which means they can process information and don't need to communicate with a central hub, the way cell phones do. Instead they are configured in a mesh, quickly sending data directly to neighboring nodes. The immediacy of the information creates a feedback loop with the customer: he influences the light, which in turn influences his behavior. All of the technologies needed to create this system already exist, but they have yet to be applied in this type of context.

A Harvard physics professor has SLOWED DOWN A PULSE OF LIGHT and made it stop.

Leading shopping-mall architects predict that hybrid INDOOR/OUTDOOR environments will be a leading trend in the coming years.

With the development of an inexpensive new technique for manufacturing semiconductor transistors, WALL-SIZE TVs, rollable displays, and electronic paper will soon become widely available.