

## Examples of Commercial Applications of Ubiquitous Computing

*Emerging tools will simply transform business practices —  
and customer expectations — in the near future.*

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THREE KEY ASPECTS OF EMERGING computing technologies discussed in this section make them especially attractive to new business applications: ubiquitous continuous presence, the ability to capture context through sensors, and the ability to communicate with service providers. These capabilities present new opportunities as well as challenges to businesses and organizations as illustrated by the following two examples.

**Railcar Telematics.** Large chemical companies often deliver their products in railcars. One problem they face is the lack of timely information about the location of their cars, their physical condition and, most importantly, whether the cars have been unloaded. One company recounted how they would locate their railcars by calling their customers and asking them to literally look out the window at their railroad yards to see if their railcar was there.

We helped that company instrument their railcars with sensors that track the car's position, temperature, acceleration, and weight, and report that data via a satellite link. The result is a system that enables our client to track their railcars and monitor their state, offering key business benefits, such as:

**Just-in-time billing.** In the past, companies billed their customers when the railcar returned to their facilities. Now, companies can bill as a product is used by a customer because they can monitor how full a railcar is.

**Railcar handling.** Railcars are expensive. Sensors on the railcars allow the company to detect mishandling of the cars and provide information necessary to resolve claims.

**Security.** This approach enables close monitoring of the transportation of hazardous material, a key homeland security concern. In fact, this system was cited by the U.S. Department of Transportation as an example of the direction the industry should follow.

**Multimedia Response Center.** In 2007, an estimated 300 million camera phones will be sold. The addition of imaging capabilities to a device as pervasive as mobile phones represents one of the most significant changes in the common infrastructure in recent years. Today, these imaging capabilities are primarily social. Friends and family exchange pictures and short

videos. However, just as traditional phones began as social devices and evolved into being a primary channel for business, camera phones are likely to follow a similar trajectory. Where traditional phones represent the capacity for a person to contact an organization in a verbal sense, camera phones represent the ability to contact an organization in a visual manner.

To handle the new media, organizations must redesign and re-equip their call centers—a huge and costly task.

Just as security concerns propelled the adoption of cell phones, security is likely to be an early organizational use of camera phones. Consider that two years from now there will likely be over 9,000 camera phones per square mile in New York City, and over 4,000 in Chicago. It is just a matter of time before people witnessing a crime or a lost child will snap a picture and want to show it to the police, but find the police ill-equipped to receive or use the media. In recognition of this development we have been exploring how to use media with a number of police departments. Specifically, we are studying the technological and organizational changes required to enable call centers to accommodate and incorporate media into 911 call centers as well as databases used in investigations. Issues include media indexing and retrieval, call-taker task redefinition, and chain of custody and privacy concerns. While 911 call centers are an early application, we believe that consumers will simply expect to be able to show things to the organizations with which they interact, just as they currently expect to call or email them.

These examples demonstrate how near-term ubiquitous computing technologies are enabling significant changes in the way companies conduct business. **G**

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