**Reality gets better**

Many of us are familiar with the concept of virtual reality, either from films like Avatar and The Matrix, or from science fiction novels and video games. Virtual reality is a computer-generated, interactive, three-dimensional environment in which people become immersed. But in the past few years, a new spin on virtual reality known as augmented reality has emerged as a major focus of many companies' marketing efforts. More than just science fiction, augmented reality is an exciting new way of creating richer, more interactive experiences with users and future customers.

Augmented reality differs from traditional virtual reality because users of augmented reality (also called AR) tools maintain a presence in the real world. In virtual reality, users are completely immersed in a computer-generated environment, and often use head-mounted displays that facilitate the immersion and eliminate any interference from the real world. Augmented reality mixes real-life images with graphics or other effects and can use any of three major display techniques-head­ mounted displays, just as with virtual reality, spatial displays, which display graphical information on physical objects, and handheld displays.

Almost everyone has already encountered some form of AR Technology. Sports fans are familiar with the yellow first-down markers shown on televised football games, or the special markings denoting the location and direction of hockey pucks in hockey games. These are examples of augmented reality. Other common usages of AR include medical procedures like image-guided surgery, where data acquired from computerized tomography (CI') and magnetic resonance imaging (MRI) scans or from ultrasound imaging are superimposed on the patient in the operating room. Other industries where AR has caught on include military training, engineering design, robotics, and consumer design.

As companies get more comfortable with augmented reality, marketers are developing creative new ways to use the technology. Print media companies see AR as a way to generate excitement about their products in an entirely new way. Esquire magazine used AR extensively in its December 2009 issue, adding several stickers with designs that, when held up to a Web camera, triggered interactive video segments featuring cover subject Robert Downey Jr. Turning the magazine in different directions yielded different images. A fashion spread describing dressing in layers showed actor Jeremy Renner adding more layers as the seasons changed. The orientation of the magazine as held up to a Web camera determined the season.

Lexus placed an advertisement in the magazine that displayed "radar waves” bouncing off of nearby objects on the page. Again, adjusting the angle of the magazine affected the content of the ad. Lexus Vice President of Marketing David Nordstrom stated that AR was attractive to him because “our job as marketers is to be able to communicate to people in interesting ways that are relevant to them and also entertaining.” User response to the magazine was positive, suggesting that AR accomplished this goal. Other companies that have pursued AR as a way to attract and entertain their customers include Papa John's, which added AR tags to their pizza boxes. These tags display images of the company's founder driving a car when triggered using a Web camera. That company's president believes AR is “a great way to get customers involved in a promotion in a more interactive way than just reading or seeing an ad.”

Mobile phone application developers are also excited about the growing demand for AR technologies. Most mobile phones have camera, global positioning system (GPS), Internet, and compass functionalities, which make smartphones ideal candidates for handheld AR displays. One of the major new markets for AR is in real estate, where applications that help users access real estate listings and information on the go have already taken oft'. An Amsterdam-based start-up, application developer layer, has created an app for French real estate agency MeilleuraAgents.com where users can point their phones at any building in Paris and within seconds the phone displays the property's value per square meter and a small photo of the property, along with a live image of the building streamed through the phone's camera.

Over 30 similar applications have been developed in other countries, including American real estate company Zip Realty, whose HomeScan application has met with early success. While the technology is still new and will take some time to develop, users can already stand in front of some houses for sale and point their phones at the property to display details superimposed on their screen. If the house is too far away, users can switch to the phone's interactive map and locate the house and other nearby houses for sale. ZipRealty is so encouraged by the early response to HomeScan that it plans to add data on restaurants, coffee shops, and other neighborhood features to the app. Another well-known application, Wikitude, allows users to view user-contributed Web-based information about their surroundings using their mobile phones.

Skeptics believe that the technology is more of a gimmick than a useful tool, but Layer's application has been downloaded over 1,000 times per week since its launch. Being able to access information on properties is more than just a gimmick-it is a legitimately useful tool to help buyers on the go.

Marketers are finding that users increasingly want their phones to have all of the functionality of desk­ top computers, and more AR mash-ups have been released that display information on tourist sites, chart subway stops, and restaurants, and allow interior designers to superimpose new furniture schemes onto a room so that potential customers can more easily choose what they like best. Analysts believe that AR is here to stay, predicting that the mobile AR market will grow to $732 million by 2014.

**CASE STUDY QUESTIONS**

1. What is the difference between virtual reality and augmented reality?

2. Why is augmented reality so appealing to marketers?

3. What makes augmented reality useful for real estate shopping applications?

4. Suggest some other knowledge work applications for augmented reality