"Location, location, location?"

Ever heard of the catchphrase “Location, location, location?” It means finding the right place is a crucial factor in many business decisions. This should not come as a surprise especially if it concerns real estate. Apartments in prime locations often demand much higher prices.

Implications of Right Area

Determining the right area is critical because it has many implications - for example, whether it is a mecca for many potential customers, an anchor of political and economic stability and a tax haven. When it comes to placing street advertisements, finding the best spot is key to drawing the attention of potential customers.

Indoor and Outdoor Positioning

Being in the right place creates a lot of business opportunities. This is because different services can be provided depending on where you are. This is called location-based services, or LBS. Services such as maps, shops and promotions can be customized given our current positions.

We can now pinpoint where someone is, using the Global Positioning System - that is, if he is outdoors. For GPS, satellites above the Earth transmit signals to the ground. The users, using cell phones or other specialized devices, are able to track down locations based on the signals received. GPS is so powerful that it has been widely used for outdoor positioning and navigation.

It has already enabled many successful outdoor LBS and business opportunities, such as finding the closest petrol stations or restaurants while you are driving, or getting to the closest landmarks while touring a foreign city.

While GPS can provide outdoor locations, the satellite signals cannot penetrate indoors, such as finding friends in a mall. Locating a user inside a building still presents a challenge to researchers. Indoor location tracking technology is still in its infancy.

Indoor Positioning Implication

Why are we interested in indoor location? Statistics show that 90 percent of people’s time is spent indoors. Indoor positioning thus offers significant business potential. There are, in fact, many lucrative business applications for indoor LBS. With an indoor location capability, it would be easy to navigate various environments. For example, in a mall you may find yourself asking the following questions: Where am I exactly? What is the closest restaurant I can go to? What are the shops that do promotions today and how can I get there? These are some questions that pop up when we get stuck in an unfamiliar indoor environment.

It is clear that indoor, location-based service, or LBS, offers a lot of convenience. Users no longer need to look for and consult fixed shopping directories and maps in a mall and get lost on the way.
Indoor Location-based Advertising

Using LBS, shops can aim targeted advertisements at their customers. For instance, while a customer is browsing the menu outside a restaurant, if a discount coupon pops up on the shopper's mobile, it may entice them in. Or when a shopper is in a store, a timely coupon, depending on the location, may alter the customer's buying behavior. This will greatly enhance the revenue of the business.

Indoor location-based advertising is a new market to be tapped. The latest research report from Berg Insight, which offers premier business intelligence to the telecom industry, estimated that the total value of the global real-time mobile location-based advertising ad (such as location-specific SMS, mobile search and coupons) will account for 33 percent of all mobile marketing in 2017, and which will be worth a total of 6.5 billion euros (HK$66 billion).

It is clear that knowing your location accurately may change our lives, our way of shopping and the way of doing business.

Making LBS Successful

To make LBS a success, we need the following three enabling technologies: accurate localization (knowing one's position), timely tracking (learning one's position over time), and efficient navigation (guiding a person from one place to another).

Currently, my group of researchers and developers in the Multimedia Technology Center at the Hong Kong University of Science and Technology are working on these LBS technologies. The R&D work has received extensive support from the government and industry. We are developing innovative solutions overcoming many major technological and deployment challenges to offer indoor localization, tracking and navigation.

Through rigorous research methodologies, software development cycles and experimental trials in real industrial settings, the technologies we are developing will help to make indoor LBS a truly deployable and viable business. In the near future, when you are visiting a new mall or business complex, you will no longer need to painfully look for its directories. With our technologies, you will be guided on your mobile so that finding your destination in a strange environment can become a joyful and fun experience. You will then appreciate what it means by location, location, location.