White Paper

Transforming the Mobile Experience with Cisco Wireless Location Services

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Overview

It's a mobile world, with almost 7 billion mobile subscribers worldwide this year,[1] the equivalent of almost one device for every person on the planet. The rapid increase in mobile devices is making Wi-Fi a preferred method of network access, with the United States having more than 1 mobile device per person and 125 million smartphones shipped every year.[2]

With this growth rate, and a predicted 10 billion mobile devices by 2016, organizations can look to mobility and the Wi-Fi network to deliver innovative user services and enhance the customer experience.

At the same time, this trend presents businesses with both tremendous opportunities and unique challenges, and numerous innovative businesses are rapidly emerging to help unlock business value from this growth.

Wi-Fi: Enabling Business Value

Wi-Fi networks seem to be everywhere, and we consumers are demanding more and more from them in terms of ubiquity and performance - yet we are pushing back on paying for this service. Today we expect Wi-Fi in coffee shops, hotels, airports, stores, stadiums, and even on the streets of our cities, so that we can view videos, download apps, and make calls at any time.

Given advances in technology, these Wi-Fi networks, while providing valuable Internet access to mobile users, are collecting massive amounts of information that can provide new insights to the people using the network and, consequently, business value.

Cisco® Connected Mobile Experiences (CMX), built on the Cisco Unified Access™ infrastructure, transforms the location data associated with devices seen on the wireless LAN (WLAN) into valuable business knowledge, which is immediately actionable by marketing, operations, and security.

The base data, collected by every Cisco Mobility Services Engine (MSE) and passed to CMX, consists of the discrete time, location, and MAC address of every device detected within the coverage area of the access points in the network. (Note that a device need not be connected to the WLAN to be identified and have its location estimated.) Significantly, the observations can be assembled into a set of time-ordered points per device, on which zone and movement analytics can be applied. However, with the huge quantities of data, in order to get valuable insights, a complex set of innovative data mining and data filtering techniques need to be applied.

Using these filtering techniques, various factors such as dwell times, patterns of movement, crowding, identification of bottlenecks, etc., can be systematically calculated to deliver enormous value to marketing, operations, and business management functions.

[1] International Telecommunication Union, June 2012.
[2] http://mobithinking.com/, 2013.

Unlocking the Value in Location-Based Wi-Fi

As an ever-increasing number of venues and cities deliver Wi-Fi access for their occupants, those deploying Cisco's CMX solution are starting to get real value back from their investment. This solution is turning Wi-Fi into a valuable business enabler. With a framework of detect, connect, and engage (Figure 1), the following are examples of how this value can readily be realized.

Figure 1. Value of Using Wi-Fi to Detect, Connect, and Engage with Guests

Value of Detect and Connect

- Ability to analyze what is happening within the venue, using anonymous[3] data from every device[4] with Wi-Fi enabled (no need even to connect to Wi-Fi), to answer questions such as:
  - What are the busy areas or zones in the venue, by hour, day or week?
  - Where do most people spend time in the venue? Does that vary by day, by hour, or by customer type?
  - Where do people go while in the venue? What paths do they take, or what zones and stores do they visit, and in what order?
  - How often do devices return? Do the patterns of behavior differ for first-time visitors compared to repeat visitors?
  - What is the effect of a particular promotion or advertisement - did more people go to the promoted area during the campaign compared to before?
- If the device connects to the WLAN and the user provides certain demographic data as part of the registration for the Wi-Fi service, such as email, gender, home city, etc., this data can be included in the analytics.

[3] Wi-Fi access points are constantly collecting information on all devices without users having to authenticate on the network. This means that venues are collecting information on a large number of people - effectively anyone who enters with a Wi-Fi-activated device. However, this does not raise personal privacy issues, because no personal or demographic information is collected, only the MAC address of the device, and the information is aggregated across all users.

[4] Recent research by Cisco Internet Business Solutions Group (IBSG) shows that consumers have an average of 2.6 mobile devices, most of which are now Wi-Fi enabled.

Value of Engage

- Cisco CMX enables venues to engage with customers in a targeted contextual manner through their mobile devices
  - Customers can now use their mobile devices to:
    - Navigate through the store or mall
    - Receive relevant information based on their location
    - Interact with personnel
  - Venues can now interact with their customers to:
    - Provide information on locally available services
    - Enable navigation to various products or services
    - Push targeted location-aware promotions directly to the device

  Cisco's solution is founded on a sequence of innovations, including advanced Wi-Fi-based indoor location, a flexible API with support for REST to integrate location into mobile applications, and location-enabled hardware with chip and device manufacturers. Together, these capabilities are transparently integrated to provide a powerful solution in which organizations can use location to engage via mobile devices through mobile apps, the mobile browser, or the mobile device itself.

Business Value from Wi-Fi Location-Based Services

Many different industries are starting to unlock the value of Wi-Fi location-based services on a global basis. A selection of use cases is presented here that are being deployed to increase business value in different industries.

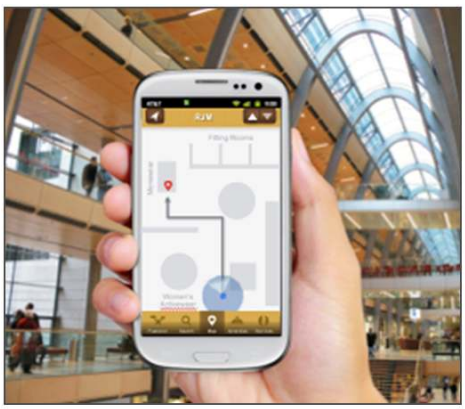
Retail

Operational Effectiveness

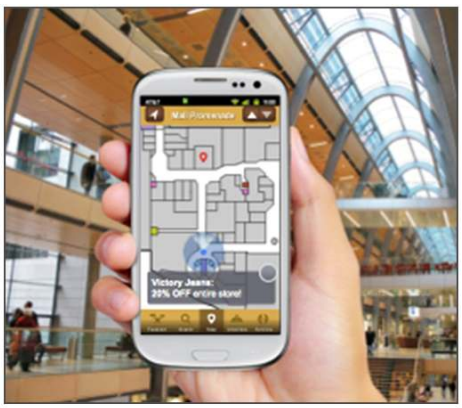
Knowing how many people are in your store at various times can assist with staff planning and scheduling, helping ensure that you don't waste expensive resources when they are not needed and that you don't lose valuable customers due to service delays during busy times.

Promotional Effectiveness

Understanding if a particular promotion in the store is working or is getting customer attention can be hugely valuable. For example, are more people going to the promoted area of the store during the promotion than in the period beforehand? Or are customers staying longer in the sale areas than in other areas?



In-Store Navigation



Promotions and Mapping

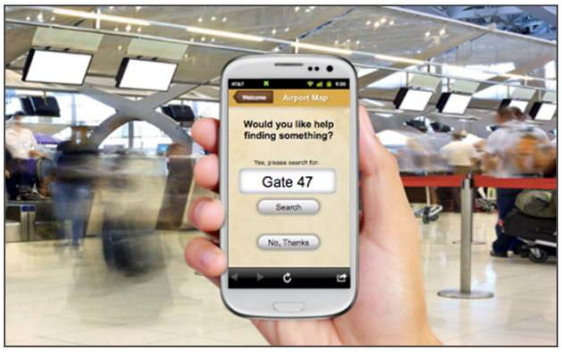
Customer Engagement

Using location-based services to engage customers to deliver greater services and superior experiences provides them with opportunities to increase their spending. You can deliver specific user content to a device based upon location to greatly enhance the visit or offer targeted promotions to the user.

Transportation

Airports and railways are looking to deliver value-added services and customer experiences to their passengers while getting enhanced insight and information that can deliver both operational and marketing benefits.

- Airlines are seeking to provide enhanced experiences to their passengers, enabling ease of movement and navigation, providing notifications and alerts for gate changes, etc.
- Railways offer live information push (such as notifications of train delays, engineering work, etc.) to devices based on platform location.
- En route navigation information informs passengers of their connection to the next transportation link or how to navigate between terminals for connecting flights.



Operational Effectiveness

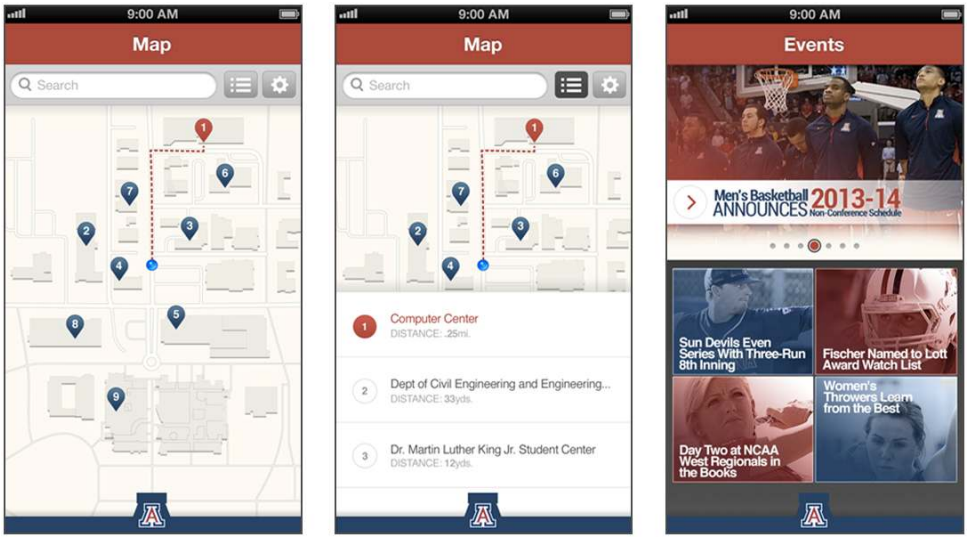
- Traffic optimization of subway, airport, rail, or bus networks
- Rerouting passengers around bottlenecks

Education

Location-based services are being used in higher education in these five ways:

Enhanced User Experience

Providing personalized campus tours with location-based information and insights, such as information on key points of interest, little-known facts, and cool locations to visit.



Improved Campus Operational and Management

Understanding how the campus is used can provide very important information and insights to college authorities. Discover which restaurants are the busiest; what patterns occur and vary by day, week, or semester; where students congregate; and when places are crowded. Location-based services can even enable alerts when potential overcrowding occurs.

Enhanced Learning Experience

Location-based services can be used to give access to the course materials for lectures to all students or devices who actually attend the classroom, while geo-fencing a classroom or lecture zone.

Enabling Specific Event Experiences

Specific events on the school calendar, such as football games, alumni events, and concerts, are jam packed. Adding another layer of engagement to location-based services enables a university to deliver highly customized services and/or promotions to that target audience.

Promotional and Marketing Opportunities

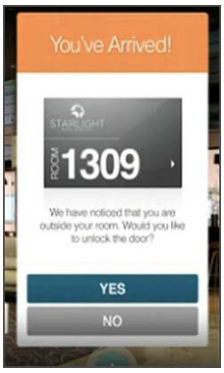
An obvious benefit of location-based services in higher education is the ability to offer location-based promotions or incentives to students, such as restaurant offers, loyalty programs, or discounts for events.

Hospitality

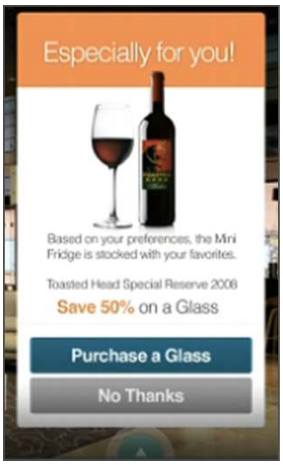
Various applications provide significant business value in hotel or resort deployments.

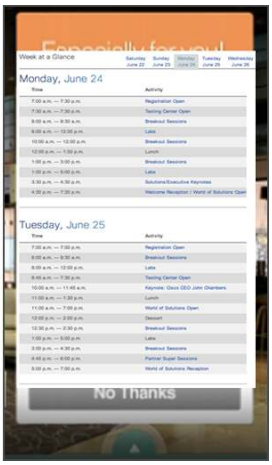
Enhanced Customer Experience

- Location-based services can enable guests to automatically check in when arriving at the hotel, navigate to their room, and enter via keyless entry.



- Additional capabilities include delivering a targeted promotion to the device, or delivering a conference schedule, with navigation to each session.





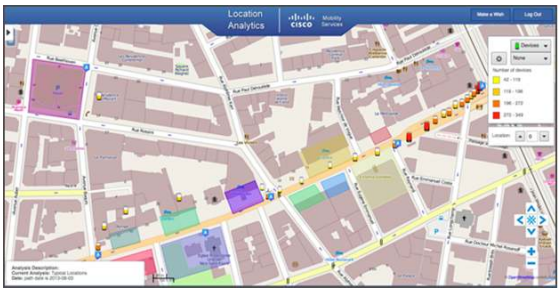
Value to Resort Business Executives

- Deliver local services or a virtual concierge service: Book taxis, reserve tickets for shows, make restaurant reservations, provide information on local attractions, etc.
- Offer promotions or customer service messages, such as:
  - Bar and restaurant promotions
  - Access to club rooms
  - Spa offers and local deals

- Make service and operational improvements - design the layout for an actual usage pattern and verify the impact.

Cities

CMX Analytics enables city organizers to view busy parts of the city and see how device density varies across the day and week.



The powerful location analytics component of CMX takes operational planning to the next level, providing intelligence on where the busy restaurants are and how long people spend there, and insights into where people come to the restaurant from and where they go afterward.

Value to Visitors and Citizens

- Visitor app enabling them to book tables at nearby restaurants
- Street navigator to attractions, information on points of interest, etc.
- “Timer” for when their bus or train is approaching
- Ability to locate and access bike services or transportation services
- Ability to find parking spaces and find their car

Value to the City

- Local services optimization - the nearest services can be dispatched to the location
- Ability to provide alerts regarding traffic jams or incidents
- Insights into customer and visitor movement for local businesses

CMX can also help authorities measure the effects of events on the city:

- Promotions: Calibrate before and after the marketing of a specific event, such as local farmers markets, etc.
- Outdoor events: Understand busy areas and times for public safety and planning
- Provide path analysis through the city, starting from train and bus stations, parking lots and garages, etc.

Summary

Many use cases are emerging every week for which Cisco's CMX is enabling tangible business value to customers. This is occurring across multiple industries on a global basis, both from an enterprise and a service provider perspective.

To keep up to date on these developments, and for more information on CMX, visit http://www.cisco.com/go/cmx.

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