
MOBILE COMMERCE

E-commerce, winter 2011



Mobile Commerce

- * Mobile commerce, or m-commerce, or m-business, includes any business activity conducted over a wireless communications network
- * Includes B2C and B2B commercial transactions and transfer of information
- * Internet, private communications networks, other networks

Mobile Commerce - II

- * Mobile commerce is a natural extension of e-commerce
- * Mobile devices create new opportunities to attract customers, deliver new kinds of services, etc.
- * The lack of bandwidth, device limitations, etc limited the use of mobile commerce
- * These barriers have been recently broken

Attributes of M-commerce

- * Many of the EC concepts discussed so far also apply to m-commerce
- * Some key attribute of mobile computing, however, offer the opportunity for new applications possible only in a mobile environment
- * Vendors and carriers can differentiate themselves by exploiting these attributes to offer new and useful services

Ubiquity

- * Mobile devices are available at any location and at any time
- * Easier information access in a real-time environment

Convenience

- * It is convenient for users to operate mobile devices
- * No boot-up time, always connected, increasing functionalities, natural user interfaces

Interactivity

- * Transactions, communications, and services are usually easier to access from a mobile device
- * Such services are highly interactive in a mobile environment

Personalization

- * Mobile devices are more “personal” than personal computers
- * This enable customer personalization to an higher degree

Localization

- * Knowing where an user is physically located can be the key to offer certain mobile services in real time
- * Location-based m-commerce

Why M-commerce?

- * Widespread availability of powerful mobile devices
- * The handset culture
- * The service economy
- * Vendor's push
- * Mobile workforce
- * Increased mobility
- * Improved price/performances
- * Improved bandwidth

Infrastructure

- * Wireless mobile computing
 - * Computing that connects a mobile device to a network or another computing device
- * Mobile devices
 - * Personal Digital Assistant (PDA), Smartphones

Programming for Mobiles

- * Developing software for mobile devices is challenging!
 - * New operating systems
 - * Technological limitations
 - * New sensors to play with

Software and Services

- * SMS
 - * text messaging, popular in Europe and Asia
 - * 160 character instant message
 - * MMS introduced in 2002
- * Location based-services
 - * use GPS or wi-fi to infer location
- * Voice support services
 - * Voice portals, services for disabled, etc.

Networks

- * All mobile devices needs to connect to a network or with another device
- * Different networks can provide different services

Networks - II

- * Personal Area Network (PAN)
 - * Very short range device-to-device connections (some meters - single room)
 - * Bluetooth is the most common way
- * Wireless LAN
 - * Same technology as LAN, but without cables
 - * private and public hotspots

Networks - III

- * Municipal Wi-Fi Networks
 - * A large number of connected hotspots
 - * city-wide network
- * WiMax
 - * relatively fast access to a medium-sized area (50Km)
 - * similar to the cell phone network (cells)
 - * requires different hardware from wi-fi
 - * spectrum need license

Networks - IV

- * Wireless Wide Area Network
 - * Same network technology of cell phones
 - * Access available anywhere there is a cell phone network
 - * Different speeds (2G, 3G, 4G, etc)

WWAN Generations

- * 1G: analog-based, from 1979 to 1992, voice only
- * 2G: digital, accommodate SMS
- * 2.5G: new cell protocols (GPRS), better speed for limited graphics and MMS
- * 3G: support for rich media, in use from 2002
- * 3.5G: digital mobile telephony, mobile TV, other media
- * 4G, 5G: Even faster

MOBILE APPLICATIONS

Mobile Payments

- * Payment transactions confirmed using a mobile (smart)phone
- * Proximity or contactless payments, Near Field Communications
 - * An handful of pilot projects (BART, Japan Taxis, etc)
- * Mobile remote payments
 - * enable customers to use their mobile phone to pay bills, shop on Internet, etc

Mobile Banking

- * Mobile access to financial information, account information, stock prices, locate ATMs, etc
- * SMS alerts for credit cards

Mobile Marketing and Advertising

- * There are roughly 2 mobile devices for every desktop computer
- * Targeting these devices is an high opportunity for marketing
- * The most interesting field are location-based ads

Four Classes of Campaigns

- * Information: provide information about products, poi, news, etc
- * Entertainment: provide amusement, games, music, etc
- * Raffles: programs that provide prizes
- * Coupons: offer monetary incentives (like discounts), trials, etc

Major Objectives

- * Building brand awareness
- * Changing the brand image
- * Promoting sales
- * Enhancing brand loyalty
- * Building a customer database
- * Stimulating mobile word of mouth (facebook places?)

Examples and Limits

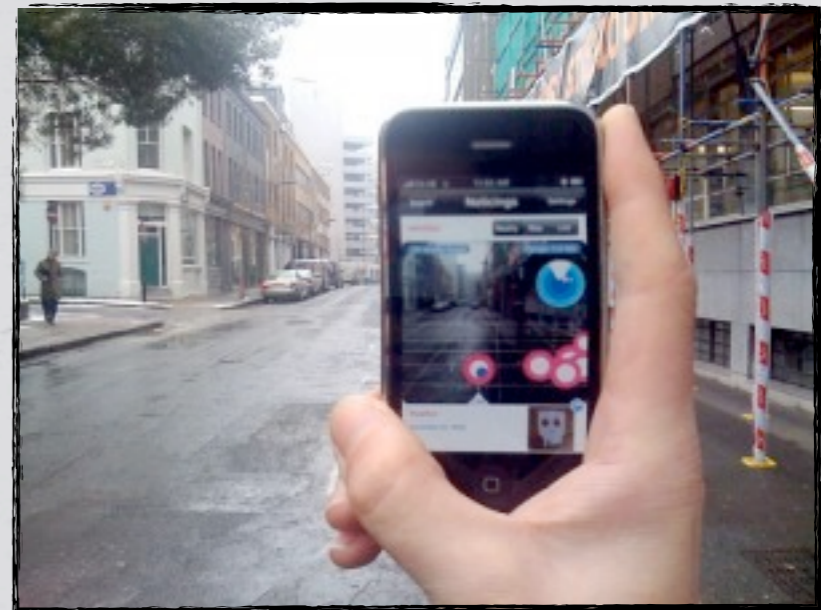
- * SMS opt-ins (Armani)
- * Bluetooth offers and information (Decathlon)
- * Many others

Mobile Entertainment

- * Leisure activities that use wireless communications
- * Large segment of mobile market
 - * Mobile Music and Video
 - * Mobile Games

Location-based M-commerce

- * Use of GPS-enabled devices or similar technologies to deliver ad-hoc products and services
- * At first, Internet made the world flat
- * In late years mobile devices with GPS, netbooks, etc added a new dimension
- * Navigation, Product Tracking, Leisure, etc.

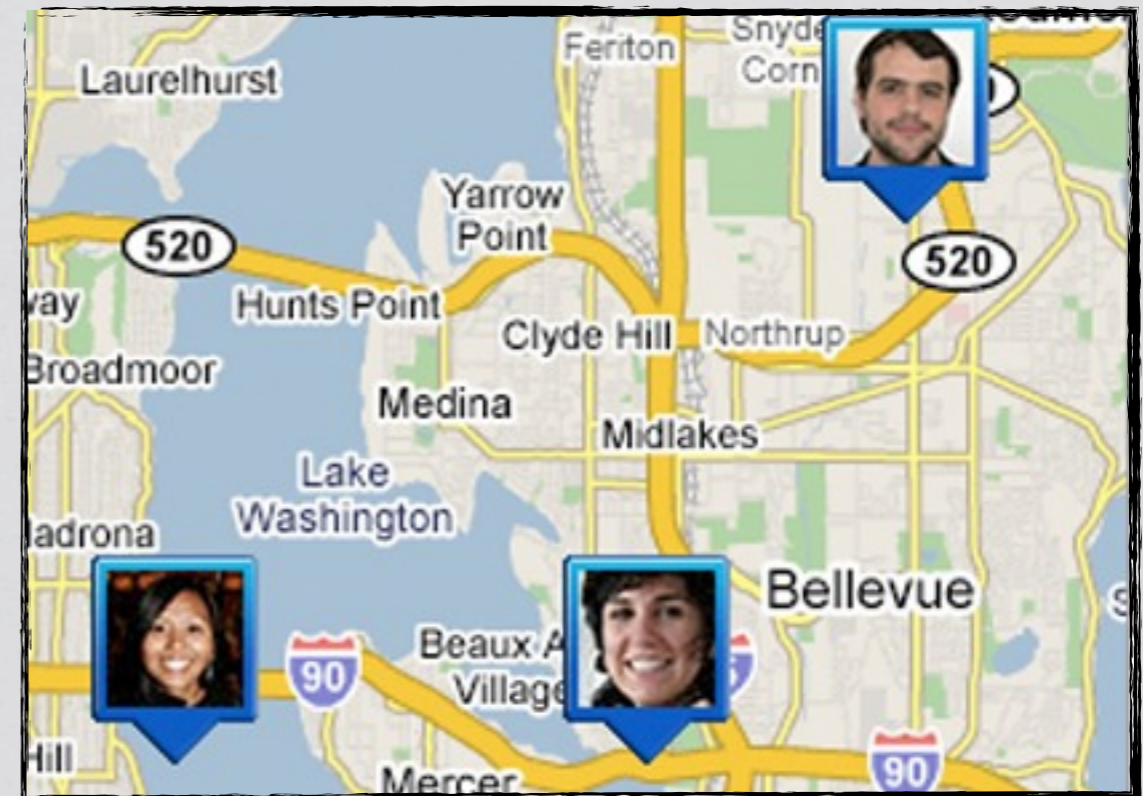


Case of Study: Google Latitude

* Google location-based service

- * **Google Latitude** is a [location-aware mobile app](#) developed by [Google](#). Latitude allows a [mobile phone](#) user to allow certain people to view their current location. Via their own [Google Account](#), the user's cell phone location is mapped on [Google Maps](#). The user can control the accuracy and details of what each of the other users can see — an exact location can be allowed, or it can be limited to identifying the city only. For privacy, it can also be turned off by the user, or a location can be manually entered. Users have to explicitly opt in to Latitude, and may only see the location of those friends who have decided to share their location with them. [Wikipedia]

* Google Latitude encourages users to check in at retail locations



Latitude and Positioning Systems

- * Google Latitude is compatible with most devices running Android, BlackBerry OS, Windows Mobile, Symbian S60, and the iPhone
- * Wi-Fi-based positioning system (WPS) emerged as an idea that can solve the positioning in certain situations (like indoors), taking advantage of the rapid growth of wireless access points in urban areas
- * Hybrid positioning systems are systems for finding the location of a mobile device using several different positioning technologies. Usually GPS (Global Positioning System) is one major component of such systems, combined with cell tower signals, wireless internet signals, Bluetooth sensors or other local Positioning Systems

Limits of location-based m-commerce

- * Lack of GPS

- * phones can infer location also from cells and wi-fi networks

- * Accuracy

- * GPS accuracy is around 15 meters. Wifi around 200, cells 1km

- * Privacy

- * You can let your phone locate yourself, but do you want it to?

PERVASIVE COMPUTING

Pervasive Computing

- * In pervasive computing every object has processing power and a wireless connection to a network
- * Invisible, everywhere computing, also called embedded computing, ubiquitous computing
- * The opposite of virtual reality

Invisible

- * By “invisible” we mean that the embedded computers would not intrude our consciousness
- * The most profound technologies are those that disappear

Principles

- * Decentralization
- * Diversification
- * Connectivity
- * Simplicity

Internet of Things

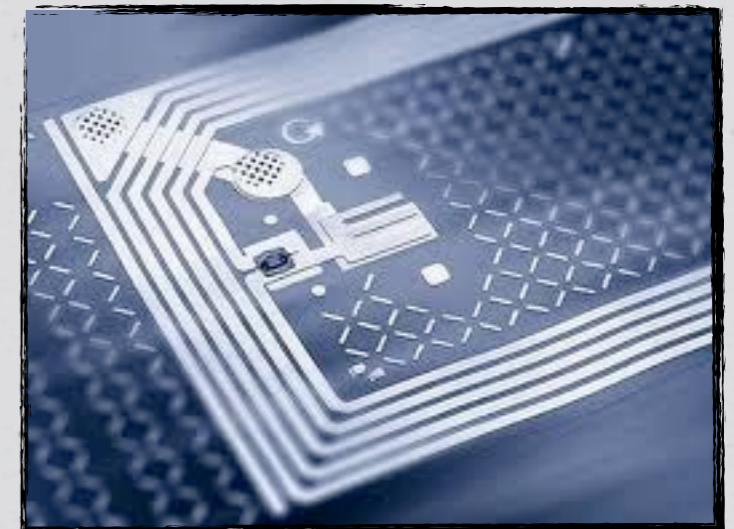
- * The Internet would become an “Internet of Things”
 - * Identify the “things”
 - * Enable detection changes in the physical status of “things”
 - * Embed intelligence in “things”
 - * Enable “things” to communicate

Case of Study: RFID

- * Radio Frequency Identification (RFID)
- * Two main components
 - * a tag composed of a microchip, antenna, maybe battery
 - * a reader able to contactlessly read tags

RFID

- * RFID tags can be passive or active
- * passive = no energy source
- * active = energy source



RFID Applications

- * Tracking and identifying people
- * Tracking vehicles
- * Tracking animals
- * Tracking stuff
- * Tracking inventory and supply chain

RFID APPLICATIONS

Selective Cat Doors



*Scans your cats
microchip BEFORE
your cat gets
to the door.*

Cats Love It!™

Internet of Things: Tag e Sensori a Venezia

- * Venis (Venezia Informatica e Sistemi), azienda di servizi Ict dell'Amministrazione Comunale di Venezia
- * finanziamento di 10 milioni di euro stanziato nel 2009
- * progetto denominato "Cittadinanza Digitale"
- * Sviluppo della banda larga e del Wi-Fi, per un totale di 10mila chilometri di fibra e 120 hot spot
- * GeoLp: piattaforma per la geolocalizzazione dei lavori pubblici
- * Argos (Automatic & Remote Grandcanal Observation System): sensori distribuiti lungo il canale capaci di tracciare la posizione, la velocità e la direzione di ciascun natante, offre un monitoraggio continuo e in tempo reale del traffico di imbarcazioni, consentendo l'identificazione immediata di situazioni critiche (incidenti, congestioni)



In giro per Venezia, con un tag

- * uno dei più avanzati sistemi di bigliettazione contactless italiani, integrando un chip e un'antenna Rfid nei biglietti cartacei
- * Progetto avviato nel 2000: il grande flusso di turisti e lavoratori rendeva il sistema tradizionale di biglietti poco efficace
- * Utilizza tag RFID passivi nei biglietti e lettori RFID contactless come “obliteratrici”
- * Il biglietto diventa un oggetto intelligente: in fase di studio soluzioni per utilizzarlo anche per accedere a mostre, musei e altre strutture
- * Adatto alla vendita di abbonamenti e biglietti cumulativi



5 tecnologie che cambieranno il retail

◆————◆
I commercianti sperimentano nuove
soluzioni in-store



Self Checkout

- * Sistemi di spesa fai da te
- * Anche oggetto di studi accademici
- * Scanner leggeri, ergonomici, funzionali
- * Possibilità di imbustare i prodotti mentre vengono acquistati
- * Pagamento integrato con il sistema di scanning
- * Sperimentazioni con registratori di cassa che leggono tag RFID (acquisto senza scansione)

Facebook nei Camerini

- * Nel mondo offline lo shopping è un fenomeno sociale
- * Portare i social media all'interno dei negozi
- * In Spagna la Diesel utilizza dei totem che integrano una fotocamera digitale vicino ai camerini, è possibile fotografarsi con il capo provato e condividere la scelta su Facebook

Shopping online in-store

- * Browsing degli articoli in negozio, acquisto online
- * Vengono sorpassati alcuni limiti dello shop online

Scanning do it yourself

- * Abilitare gli smartphone dei clienti a leggere i codici a barre
- * Ottenere maggiori informazioni sul prodotto, conoscere le offerte
- * Risparmio su commessi e allestimenti
- * Diversi esperimenti con l'utilizzo di QR Code



Location-based Coupon

- * I consumatori possono fare il checkin del loro arrivo in un negozio per ottenere un bonus
- * Permette al negozio di inviare materiale promozionale, aumenta la visibilità sui social network

Persavise Systems Limitations

- * Technical limitations
- * Ethical considerations
- * Legal barriers
- * Trust problems

Conclusions

- * Principles of mobile commerce
- * Principles of location-based commerce
- * Pervasive computing & RFID cases