Mobile and ubiquitous business (mbusiness)

I. What is mbusiness?
   • How does it work?

II. The mbusiness value chain
   • Who is taking advantage of mbusiness?
   • Benefits of mbusiness
I. What is mbusiness?

The wireless net is a radio frequency-based service that provides access to the web and net email

Includes common carriers’ proprietary sites, third party sites that have contracted with the carriers, and sites formatted for wireless devices

Technologies: instant messaging, paging, and SMS

Consumers access the web and data services through mobile phones, pagers, two-way radios, and PDAs

The device’s content includes messaging programs, games, and portals

The type of device affects the type of content that the consumer can receive
I. What is mbusiness?

Ubiquitous commerce (ucommerce)

The use of pervasive networks to support personalized and uninterrupted communications and transactions between a firm and its various stakeholders

Provides a level of value over, above, and beyond traditional commerce

Watson et al. (2002). U-Commerce: Extending the universe of marketing, Journal of the Academy of Marketing Science
I. What is mbusiness?

Ucommerce is “the continuous, seamless stream of communications, content, and services-exchanged among consumers, businesses, suppliers and systems. Through the use of a variety of technologies—sensors, radio frequency identification tags, etc.—technology is blending into our environment creating a world which is always on, always active and always aware.”

Accenture (2005). Ubiquitous commerce - Always on, always active, always aware
www.accenture.com/xd/xd.asp?it=enweb&xd=services%5Ctechnology%5Cvision%5Ctech_ucommerce.xml
I. What is mbusiness?

To compete in the ubiquitous commerce domain, companies will have to follow the three “always” requirements:

To be always on and connected to their customers

To be always aware of their customers real-time context (where the customers are, what they are doing, what is around them)

To be always pro-active, taking advantage of the real-time opportunities to satisfy customer needs
I. What is mbusiness?

This is an example of an ubiquitous wireless (and seamless) network

www.onlab.ntt.co.jp/en/ws/seamless/
I. What is mbusiness?

M-business is a subset of u-commerce characterized by portability, reachability, accessibility, localization, and identification.


I. What is mbusiness?

It is

“the emerging arena within which commercial transactions are made possible using handheld mobile devices that are connected by wireless networks

A predominant characteristic of M-commerce is that a person engaged in M-commerce can conduct business literally anywhere, even when wandering around, traveling between places, or visiting a different location”

I. What is mbusiness?

Attributes of mbusiness

- Ubiquitous: available everywhere in standard ways
- Always on: instant access from any location
- Location aware: knows where you are
- Personalized: knows who you are
- Convenient: easy, intuitive, key and voice interactions
- Secure: based on strong encryption

I. What is mbusiness?

Mbusiness includes “all activities related to a (potential) commercial transaction conducted through communications networks that interface with wireless (or mobile) devices”

Tarasewich, Nickerson, and Warkentin (2002). Issues in mobile e-commerce. Communications of the AIS

It will be the main driving force for the next phase of ecommerce growth

“The rapid adoption of second-generation mobile telecom systems has created a market opportunity of several hundred million consumers worldwide”

I. What is mbusiness?

Mcommerce involves:

Technologies: Smart home, radio frequency identification, ubiquitous payments and value transfer, location and context awareness, agents.

Legal issues: intellectual property protection, access to intellectual property, privacy protection, ownership of personal data

Social factors: effects on structures, emergent social practices, effects on roles within social organization units, identity and anonymity
I. What is mbusiness?

Also

Economics: pricing of ubiquitous services, valuation of goodwill and information goods, fair pricing for personal data and privacy

Business: ubiquitous business models, supply chain management and optimization, industrial design, process design, ubiquitous product development, customer relationship management.

Experience design: appliances, architecture and building, ubiquitous commerce spaces.
I. What is mbusiness?

Mobile network operators: implement and operate the countrywide mobile networks

They also act as mobile service providers by owning a portal exploiting the known billing relationship with the customer

Network equipment providers: manufacture equipment and infrastructure needed to operate a mobile network

Device manufacturers

Technology platform vendors: deliver the operating systems and microbrowsers for portable devices

I. What is mbusiness?

Wireless service providers: provide net access through mobile networks or public access wireless LAN hotspots

Wireless app service providers: develop and host apps for companies that outsource mcommerce development

Application developers: build wireless apps

Content provider/aggregator: provide content delivered to end-user

Mobile portal providers: entry points to content and services

Trading companies: firms that conduct m-commerce

Consumers
I. What is mbusiness?

Services:
- Entertainment, infotainment, retaltainment and gaming
- Tourism and experience recording
- Ubiquitous assistance through valets and personal agents
- Pervasive retail
- Remote shopping with smart home infrastructures
- Health- and home-care
- Industrial applications
- Automotive telematics
I. What is mbusiness?

<table>
<thead>
<tr>
<th></th>
<th>E-business</th>
<th>M-business</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network infrastr.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Origin</strong></td>
<td>Govt project</td>
<td>Private cell phone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>comm services</td>
</tr>
<tr>
<td><strong>Ownership</strong></td>
<td>Public</td>
<td>Propriety</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>Universal/global</td>
<td>Separate systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for short distance,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>regional, global</td>
</tr>
<tr>
<td><strong>Bandwidth</strong></td>
<td>Unlimited</td>
<td>Limited by spectrum</td>
</tr>
<tr>
<td><strong>Data transmission</strong></td>
<td>Mainly data</td>
<td>Mainly voice</td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td>One standard</td>
<td>Multiple competing</td>
</tr>
<tr>
<td><strong>Geographic location</strong></td>
<td>None</td>
<td>Several locating system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>technologies</td>
</tr>
</tbody>
</table>
## I. What is mbusiness?

<table>
<thead>
<tr>
<th></th>
<th>E-business</th>
<th>M-business</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer base</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>PC/net</td>
<td>Cell phone/PDA</td>
</tr>
<tr>
<td>Demographic</td>
<td>Highly educated</td>
<td>Business mobile workers, younger, less educated</td>
</tr>
<tr>
<td>Leading region</td>
<td>North America</td>
<td>Europe and Asia</td>
</tr>
<tr>
<td>Transaction</td>
<td>Complete and sophisticated</td>
<td>Simple, often yes or no choices</td>
</tr>
<tr>
<td>Product info</td>
<td>Rich and easy to search</td>
<td>Simple, short, and critical text</td>
</tr>
<tr>
<td>Product/services</td>
<td>Wide range</td>
<td>Limited and specific</td>
</tr>
<tr>
<td>Payment</td>
<td>Mainly credit card</td>
<td>May use built in mechanism</td>
</tr>
</tbody>
</table>
I. What is mbusiness?

66% of US adults 24-35 own a smartphone (Nielsen, 2012)

18% of consumers redeemed a mobile coupon in the past 90 days

21% of consumers search for coupons on their mobile device while in a store

80% of mobile users prefer locally relevant advertising and 75% are more likely to act after seeing a location-specific message (Mobile Audience Insights Report from JiWire, Feb 2012)

52% of adult cell phone owners use their devices in a store to get help with purchasing decisions (Pew American & Internet Life Project, 2012)
I. What is mbusiness?

Drivers of mbusiness

The spread of mobile networks across geographic regions

The fast transfer of data on these networks

The development of standards and protocols delivering net-like services on smaller screens

The personal nature of mobile telephones

In 2013, mobile commerce sales will rise 73% for a total of $11.6 billion

This will be ~7% of all e-commerce transactions
I. What is mbusiness?

The devices are becoming more common.

At current growth rates, global mobile subscriptions reached 89 per 100 inhabitants in 2011.
I. What is mbusiness?

Broadband is also becoming more ubiquitous

ww1.prweb.com/prfiles/2012/02/27/9229652/2012-01-Broadband-Report-Figure2.jpg
I. What is mbusiness?

Global mobile penetration reached 85% in Q4 2011 and subscriptions now total ~6 billion

~4.1 billion subscribers since many have several subscriptions

This is ~60% of the world’s population

Mobile subscriptions have grown around 13% year-on-year and 3% quarter-on-quarter

Mobile voice traffic has doubled over the last four years and continues to grow at a steady rate

Mobile data surpassed voice in Q4 09 and was double that of voice for the first time in Q1 11
I. What is mbusiness?

India, China and US account for 2.2 billion mobile subscribers

[Graph showing mobile subscriber growth in top 3 markets]

www.techinasia.com/india-mobile-china-subscribers/
I. What is mbusiness?

Global total traffic in mobile networks

I. What is mbusiness?

How does it work?

5.6 billion people use mobile telephones globally

This outstrips the number using PCs

~2 billion smartphones

Mobile phones will be as common as TVs

There are several types of wireless networks with different ranges from a few feet to thousand of miles

Personal area networks (PAN), local area networks (LAN)

Metropolitan area network (MAN) and wide area networks (WAN)
I. What is mbusiness?

PANs: between 1/3 and 10 meters

Provide cheap and portable wireless connectivity between mobile computing devices and access points.

Connections are temporary, low power and low cost.

Bluetooth (1999: IEEE 802.15 standard for 1 Mbps PANs)

Point-to-point and point-to-multipoint connections.

Piconets: two or more units sharing the same channel.

Each is a master unit and up to seven slave units.

Scatternet: piconets with overlapping coverage areas.
I. What is mbusiness?

Using Bluetooth devices

I. What is mbusiness?

Various devices on a PAN can locate each other

- It can support high data rates
- Not yet able to integrate diverse ICTs easily

Applications

- A replacement for peripheral devices’ wires
- Ad hoc networking between devices owned by different users in confined spaces (conference rooms)
- As access points to voice and data networks
- Integrated QoS support in Bluetooth allows seamless connection between voice and data services
I. What is mbusiness?

LANs: use access points 50-100 meters apart

Low cost alternatives and adjuncts to traditional departmental or campus wired LANs

Typically connect machines in a single building allowing people to roam

Using unlicensed radio frequency bands with fixed access points and low power

Base stations are connected to a wired network

A common wireless LAN technology is 802.11b

Uses the 2.4 GHz band to provide connectivity at up to 11 Mbps - slower than ethernet (54Mbps)
I. What is mbusiness?

A wireless LAN in an office

astetest.org/ atl/May_2002_mtg.htm
I. What is mbusiness?

A wireless LAN in a hotel

[Diagram of a wireless connectivity in a hotel business centre]

smc-asia.com/networkapps/wireless%20hotel%20business%20centre.jpg
I. What is mbusiness?

**MANs**: used within line of-sight range

Designed to provide broadband wireless access to business and end-users

Uses of wireless local loops with IEEE 802.16 standards

Thousands in a metro area can share high-speed data capacity for data, voice, and video

Must be within the line-of-sight of an antenna

“Last-mile” broadband connections to backbone fiber-optic networks

Uses a small number of base stations on buildings or poles to create high-capacity wireless access system
I. What is mbusiness?

A small MAN using wi-fi

eroilynet.com/wireless/2003/08/28/graphics/wi-fi.gif
I. What is mbusiness?

A line of site MAN

sourceoneinternet.com/services/wireless/wireless.html
I. What is mbusiness?

Figure 3. Hot-spots and Multiple Wireless Networks

I. What is mbusiness?

WANs: extensible nationwide networks allowing data exchange from any location with mobile and base stations, network systems

- Speeds range from 10Mbps to 1Gbps
- First generation (1978): originally for analog voice transmission with frequency division multiplexing
- Second generation (1990s): all digital, primarily voice
- Development of competing technologies in US/Europe
  - 2.5 G: uses packet switching
  - 3G: uses fast packet switching for voice/data services
  - 4G: ultra-broadband Internet access to mobile devices
I. What is mbusiness?

Wireless application protocol (WAP) developed to speed up the transfer of digital data

An open, global specification that allows mobile users with wireless devices to easily access and interact with information and services instantly

A WAP-enabled phone is a miniature browser

WAP content is marked up in Wireless Markup Language (WML)

WML allows developers to specify how content will be presented to a WAP browser

Client-side applications can be written in WMLScript (like JavaScript)
I. What is mbusiness?

How WAP works

WAP-enabled telephone

Databases, flat files, etc.

WAP

ODBC

CGI

PERL, ASP, ColdFusion...

HTTP

Web Server

Request

I. What is mbusiness?

What WML looks like

```xml
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN" "http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
  <card id="card1" title="Toolkit Demo">
    <p>
      Welcome to a Demonstration of Nokia's Wireless Application Protocol Toolkit!
    </p>
  </card>
</wml>
```

An XML document
WML DTD (schema)
I. What is mbusiness?

What it looks like onscreen

Welcome to a
Demonstration of
Nokia's
Wireless Application
Protocol
Toolkit! - From Cold

OK
I. What is mbusiness?

Supporting technologies

Auto-ID smart chips: RFID embedded in packaging and products
  Contains ID#, pricing, descriptive, location information

Location based services: map/text based routing, fixed and en route proximity searching, personalization

GPS and satellite: integrating into non-dedicated wireless devices

Security applications: Elliptic Curve Cryptography, SmartTrust

Digital wallets and ecash
I. What is mbusiness?
I. What is mbusiness?

www.sybase.com/detail?id=1027572
I. What is mbusiness?

developers.sun.com/.../midp/articles/mcommerce/
I. What is mbusiness?

What can you do with WAP?

- Read and send Internet-based digital information
- Receive notifications and alerts, e.g., when share price changes, airplane fares
- Mobile banking
- Gaming
- Carry out e-commerce
  - Purchasing via a phone-based interface
  - B2B applications: logistics and the supply chain
  - Order pizzas, airline tickets, play games, gamble, ….
I. What is mbusiness?

WAP emulators
Download from www.tutorialspoint.com/wml/wap_emulators.htm

Try these sites (with a phone or with a simulator):
tagtag.com/site/info/emulator
emulator.mtld.mobi/emulator.php
www.bbc.co.uk/mobile/web/
www.palowireless.com/wap/portals.asp

www.totaob.com/Never-locked-SAMSUNG-S8000-Jet-WAP-GPS-5MP-Phone-x-5748.html
I. What is mbusiness?

WAP (Wireless Application Protocol) and iMode take into account the constraints of wireless communications

   Limited bandwidth and end-system processing

   A constrained user interface

   Each defines a standard markup language that permits an application’s interface to be specified independently of the end device

   The delivery services is independent of the underlying networking technology

   Applications based on these protocols can be used on different networks
I. What is mbusiness?

Wireless access allows mobile interactive services to be more personalized than traditional Internet applications.

- Mobile telephones are carried by their owners everywhere and kept switched on most of the time.
- In Europe mobile users aren’t charged for incoming calls.

There is access to wireless services wherever there is a network presence.

- People can keep tabs on time-critical information.
- They can receive news, stock market reports, auction notifications or urgent messages.
I. What is mbusiness?

Personalization is enhanced by identification and tracking capabilities of the technology

Wireless-network operators using the GSM standard can determine the identity of a user

Most mobile phones are not shared, and have a personal ID number to protect the owner

The phone can be used as a means of identification

This allows easy verification for purchasing

Also, operators can detect a user’s exact location, enabling a whole range of new applications

This also raises interesting privacy concerns
I. What is mbusiness?

Cell phone tracking raises interesting privacy concerns

Mobile phone tracking might be useful to monitor even people near to you like your spouse or children, without the need of these phones at any time to suspect you.

When set up, the mobile phone tracking software won’t offer any type of indicators, and therefore remains invisible.

www.mobiletrackingsoft.com/mobile-phone-tracking
I. What is mbusiness?

Advantages of a WAP-enabled virtual work environment:

Secure and controlled wireless access to a personalized selection of corporate information sources and applications

Reduced time and location constraints associated with accessing corporate information technology applications

Increased ability of mobile employees to interact

Ability to support faster decision-making based on real time information and connect to supply chain partners

From: ebiz.salisbury.edu/mcommerce.html
I. What is mbusiness?

A device with a WAP browser (such as mobile phones and personal digital assistants) allows employees to:

- Send and receive e-mail
- Access an electronic bulletin board
- Search the office directory
- Getting weather reports, making airline reservations, and doing banking
- Accessing mobile CRM tools and sales force support
- Accessing procurement facilities and management reporting information
I. What is mbusiness?

Continued growth depends on “true third-generation networks” (3 G or IMT2000: International Mobile Telecommunications 2000)

Two problems are network speed and data streaming

Current technologies are too slow

The UMTS (Universal Mobile Telephone System) standard will raise data transfer rate to 2 megabits per second

This is one-fifth of the bandwidth available on the standard Ethernet in today’s offices

GPRS (General Packet Radio System) will allow packet switching
I. What is mbusiness?

What people have on their handsets
What people use

www.3g.co.uk/PR/October2006/3761.htm
Mobile and ubiquitous business (mbusiness)

I. What is mbusiness?
   • How does it work?

II. The mbusiness value chain
   • Who is taking advantage of mbusiness?
   • Benefits of mbusiness
II. The mbusiness value chain

Who is taking advantage of mcommerce?

![Graph showing mcommerce growth over years](www.the-infoshop.com/press/image/an7907_3.gif)
II. The mbusiness value chain

Who is taking advantage of mcommerce?

II. The mbusiness value chain

Mbusiness revenues will grow 65% annually to $24 billion in 2015 - 8% percent of all e-commerce revenue

mobilemarketingandtechnology.com/2010/05/31/24-billion-mobile-commerce-2-2-billion-mobile-advertising-in-2015/
II. The mbusiness value chain

Mcommerce in the Asia Pacific region

www.matrade.gov.my/.../news-archive/ misc-1.htm
II. The mbusiness value chain

And for what purposes?

II. The mbusiness value chain

There are seven links in the mbusiness value chain

1. Transport: maintenance and operation of the infrastructure providing data communication between mobile users and application providers

2. Basic enabling services: server hosting, data backup, and systems integration to make products available via mobile telephones

3. Transaction support provides the mechanisms for assisting transactions and payment, for security, and for billing users

II. The mbusiness value chain

4. Presentation services to convert the content of net-based applications into WML

5. Personalization support for individual users
   - User information, billing details and even the type of device used to connect to the service

6. User applications currently available: banking, book purchasing, e-mail, news, and travel
   - New services specifically for m-commerce: GIS, automatic notification of nearby friends, entertainment

7. Content aggregators design and operate portals and provide information in a category or search facilities to help users find their way around the net
II. The mbusiness value chain

<table>
<thead>
<tr>
<th>Categories</th>
<th>Chipsets/Infrastructure Platforms</th>
<th>Handset Makers</th>
<th>Application Developers</th>
<th>Content Providers</th>
<th>Operators</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples (from N. America)</td>
<td>Intel</td>
<td>Nokia</td>
<td>Lightsurf</td>
<td>CNN</td>
<td>ATTWS</td>
<td>Best Buy</td>
</tr>
<tr>
<td>Intel</td>
<td>Qualcomm</td>
<td>Samsung</td>
<td>Webraska</td>
<td>Disney</td>
<td>Cingular</td>
<td>Circuit City</td>
</tr>
<tr>
<td>Ericsson</td>
<td>Openwave</td>
<td>NEC</td>
<td>ESPN</td>
<td>Nextel</td>
<td>Sprint</td>
<td>Nextel</td>
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<tr>
<td>Openwave</td>
<td>Symbian</td>
<td>Sharp</td>
<td>Sony</td>
<td>T-Mobile</td>
<td>T-Mobile</td>
<td>Nextel</td>
</tr>
<tr>
<td>Symbian</td>
<td>Sun</td>
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</tbody>
</table>

Driving the need for insights:
- New chipsets
- Next generation platforms
- Technical advances (e.g., Bluetooth)

Operators:
- 3G deployments
- Product planning cycles

Terms:
- Own/competitors:
- New form factors
- New features
- Feature levels (e.g., image resolution)

Proposals:
- New products/applications
- Market pull strategies (like Jomadat)
- Proposals to Operators
- Exclusive partnership negotiations

Planning:
- Market planning
- New product development
- New handset partners
- Handset design

Disruptive regulation (LNP)

Order cycles (holidays)

Options:
- New devices/services being introduced
- Best Buy
- Circuit City
- Radio Shack

bm362arinto.blogspot.com/
II. The mbusiness value chain

excapite.wordpress.com/2010/08/31/will-we-point-click-search-scan-swipe-see-sign-or-touch-the-future/
II. The mbusiness value chain

II. The mbusiness value chain

Security issues in mbusiness

Confidentiality: No one (outside the transaction) can find out what was purchased and how it was paid for

Authentication: Merchants and mobile customers must be able to trust the identity claimed

Integrity: the value of transactions cannot be modified by others, knowingly or unknowingly

Authorization: parties must be able to verify if everyone involved in a transactions is allowed to make payments

Non-repudiation: No one should be able to claim that the transaction was made without their knowledge
II. The mbusiness value chain

Benefits of mbusiness

Developing new marketing channels
Improve market share
Reduce costs, increase efficiencies
Streamline the supply chain
Increase employee productivity
Target specific customers
Compete on service, not price
II. The mbusiness value chain

Enterprise application benefits

- **Suppliers**
  - Real-time customer orders, changes receipt
  - Lot-size control
  - Fast paced-product innovations
  - Collaborative forecasting

- **Manufacturers**
  - Target marketing
  - Inventory tracking and working capital management
  - Channel synchronization
  - Product life-cycle management

- **Distributor, Retailers**
  - Demand planning
  - Inventory management
  - One-to-one marketing
  - One-to-one distribution

- **End-Consumers**
  - Tailored purchase decision support
  - Convenience purchasing
  - Revenue management loyalty programs

**Areas of Value**

- **Knowledge**
- **CRM**
- **Efficiency**
- **Ease**

Enhanced Support: *anytime* and *anywhere*

[Website Link](http://www.stuart.iit.edu/courses/ecom530/fall2002/MCommerceSIM.htm)
II. The mbusiness value chain

Sector benefits

Transportation

Driver portals, real-time delivery information, load maximization, load information, real-time routing, dispatching, fleet management

Retailing

Consumer promotions, ordering, inventory tracking, data capture, training, wireless advertising
II. The business value chain

Making the pitch

Assume they will only skim the business plan (executive summary, financials)

Build credibility by showing a demo soon after introducing your idea

   This shows that your idea actually works

Explain that you have a team behind the demo

Talk about the team and your backgrounds as early as you can in the presentation

   Explain where you think you need to add to your team to round it out
II. The mbusiness value chain

Clearly explain your financing needs

Don’t assume that they understand what you want

Make your assumptions clear

Why is it the right amount?

What will it help you do?

Check in with the audience

Do they want to hear more about something?

Control the audience: don’t get sidetracked

Do not overuse generic market data
II. The mbusiness value chain

Present with panache

Don’t read your slides
  Don’t clutter up your slides

Make sure you look at the audience

If you can anticipate questions, work that into the presentation

Practice your timing, especially if you have multiple presenters and handoffs

You want to leave them with the impression that you have a sound, profitable, well-thought out and innovative business idea