



Mobile Commerce

A New Mobile Wireless Transaction Marketplace

Lynne R. Thompson & Nick Smilonich
Unisys Corporation

March 27, 2001

Topics

- Overview of Mobile Commerce
- Mobile Commerce Environment
- Elements of Mobile Commerce
- Business Perspective
- Tomorrow's Mobile Commerce
- References



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Page 2

What is Mobile Commerce?

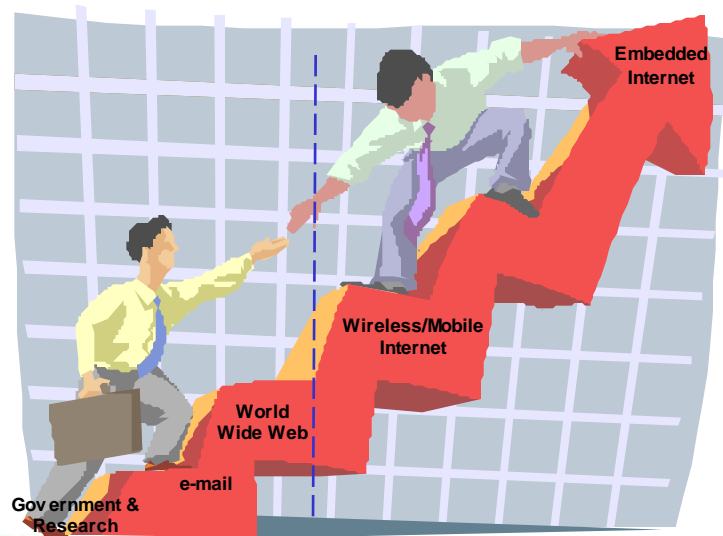
“Mobile commerce (m-Commerce) is the use of Internet-ready mobile wireless devices and appliances coupled with new wireless services to conduct business-to-business and business-to-consumer transactions over wired and wireless networks”.

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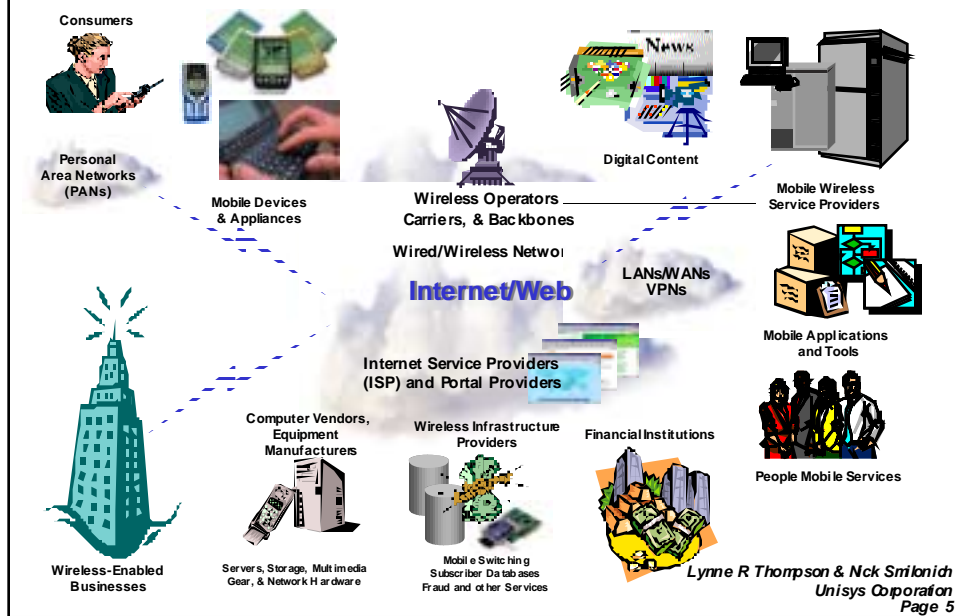
Internet Wave



2001

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m-Commerce Environment



Challenges of m-Commerce

- Bandwidth
- Physical form factors
- Standard programming models
- Security and privacy
- Cost and operating fees

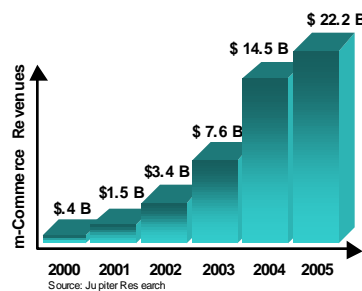
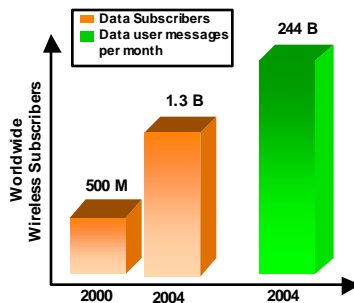
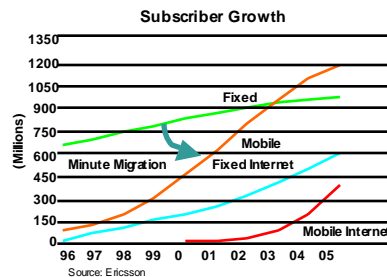
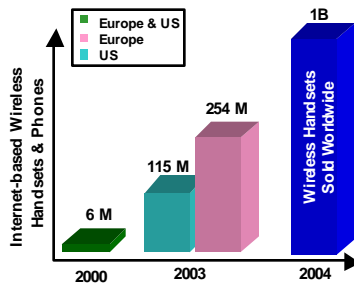
Today's m-Commerce

- Early developmental stage
- Led by Japan and Europe
- Explosion of wireless data-capable devices
- Driven by consumer purchases (e.g., tickets, travels, and stocks)
- 3G and WAP in “trough”



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M-Commerce Trends & Market Growth



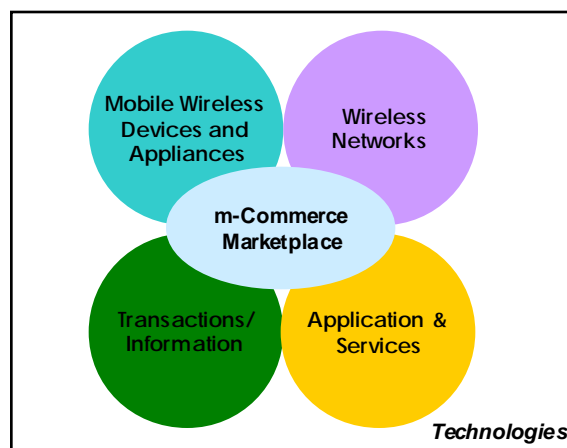
Page 8

Topics

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Elements of m-Commerce



Technologies for m-Commerce

- m-Commerce Devices & Appliances
- XML: The New Middleware
- Mobile Internet/Web
- Wireless Networks
- Security Infrastructure



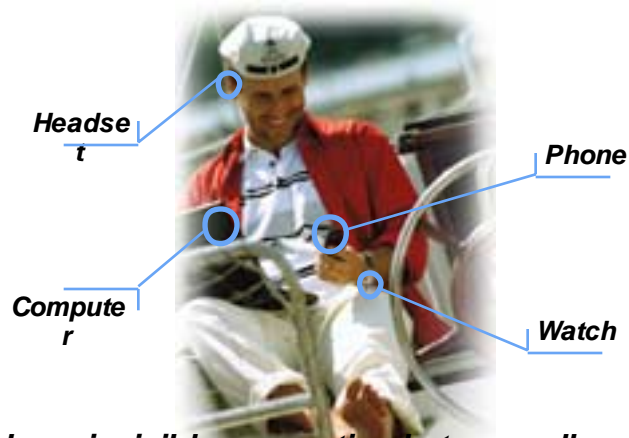
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Devices & Appliances



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Bluetooth and PAN Vision



Builds an invisible connection between all your personal information devices



Source: Nokia
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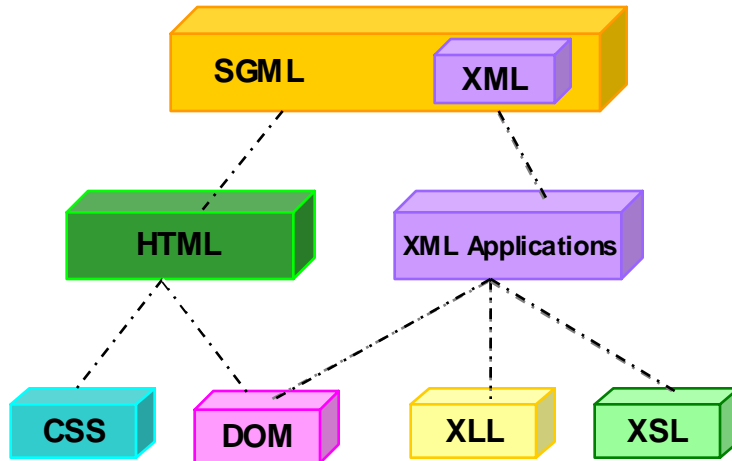
m-Commerce and XML

- Moving to XML infrastructure
- Repurposing and transcoding
- Multiple programming models and protocols
- W3C recommendations
- W3C & WAP collaboration



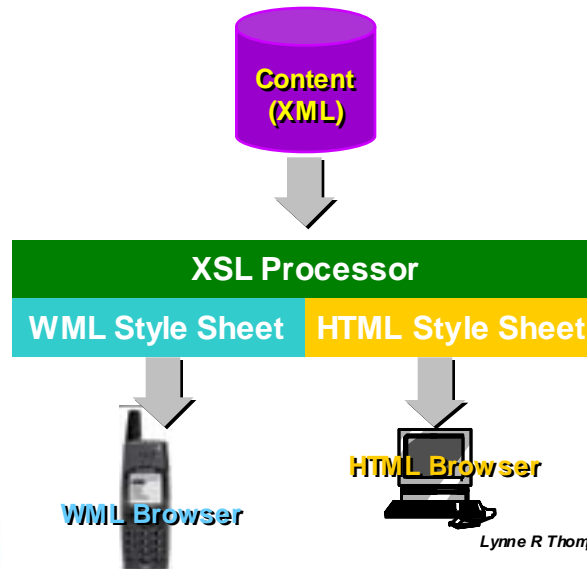
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Markup Language Family



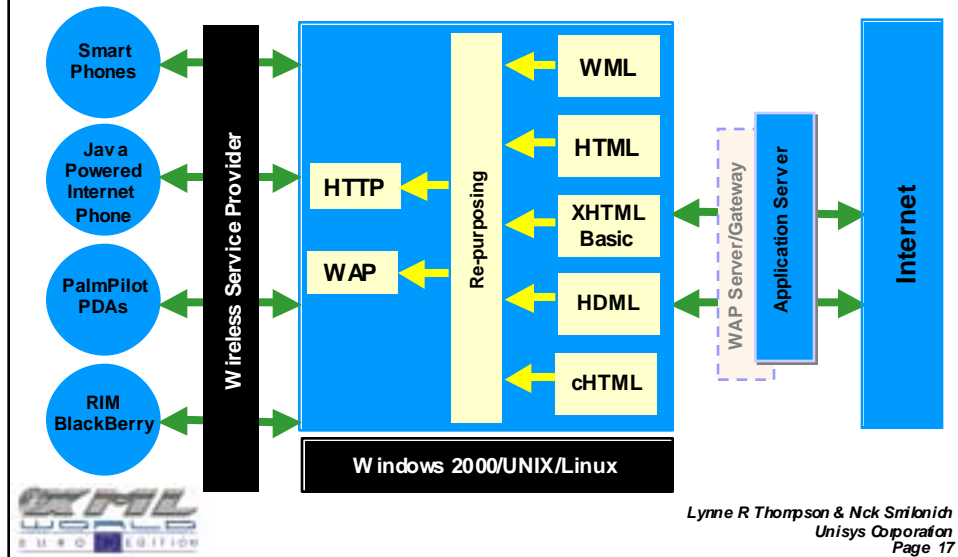
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XML/XSL and WML



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Mobile Device Re-purposing



WML and VoiceML

Is it possible to create an integrated markup language?

- W3C Voice Browser Dialog efforts
- Transcoding WML into VoiceXML
- Language integration issues

Wireless Application Protocol

Internet-based global standard that allows mobile devices to interactively access content from the Internet & corporate Intranets

E-Commerce

Product Inventory

Remote Calendar/Contact Sync

Internet Infotainment

E-Mail

Localized services

Corporate Intranet

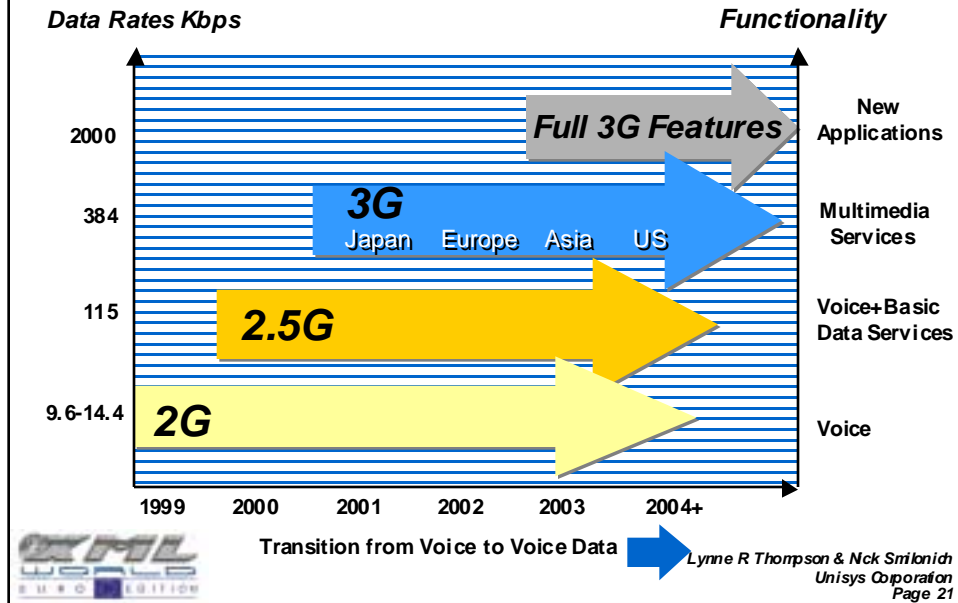
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Wireless Networks Everywhere

Use, Application	Wireless Protocol
Short Range Devices, Personal Networks	Bluetooth, Infrared
Local Networks	Wireless LAN, Narrowband Wireless Local Loop (WLL)
Broadband (BWA)	RF, microwave, satellite, Local Multipoint Distribute Service (LMDS), Free Space Optical
Home	HomeRF
Automobile	Telematics, Bluetooth
Location	GPS

Source: Nokia
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Wireless Network Roadmap



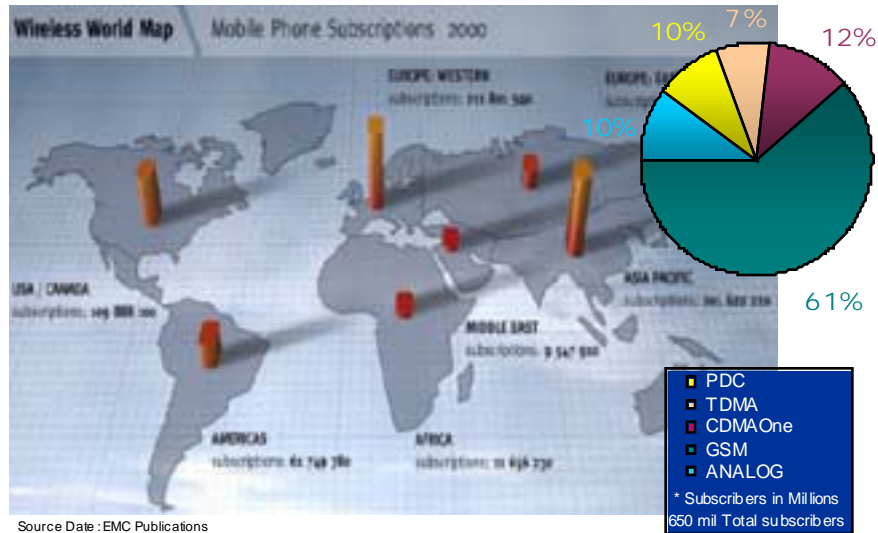
3G Networks Requirements

- **Services**
 - Traditional voice and fax
 - High Speed Data for wireless Internet and multimedia
- **Mobility worldwide**
- **"Always On" to Internet**
- **2G compatible**
- **High capacity (or spectrum efficiency)**
- **Wireless device user to initiate service**
- **Lower cost**



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Mobile Phone Subscribers



Source Date: EMC Publications



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m-Commerce Application

Scroll through menu
Select Banking \$\$
 Choose one banking option

- Checking Summary
- Savings Summary
- Money Transfer
- Customer Service

Select Money Transfer
Enter

- Amount of money to transfer
- Account # where money is coming from
- Account # where money is going to

Select Transfer
Confirmation message displayed



Page 24

Transactions & Security

- Industry drive to secure trusted wireless transaction environment
- Financial Services and Security Initiatives:
 - W3C XKMS Key Management & S2ML Security XML Markup
 - Mobey - Online wireless financial services
 - MeT - Mobile Transactions and Trusted devices
 - RADICCHIO - Secure Electronic Transactions with PKI
 - eSIGN - Mobile Digital signatures
 - MEST - Electronic signatures
- Smart phones and device cards
- Microbrowser & Java device integration
- Push/Pull delivery



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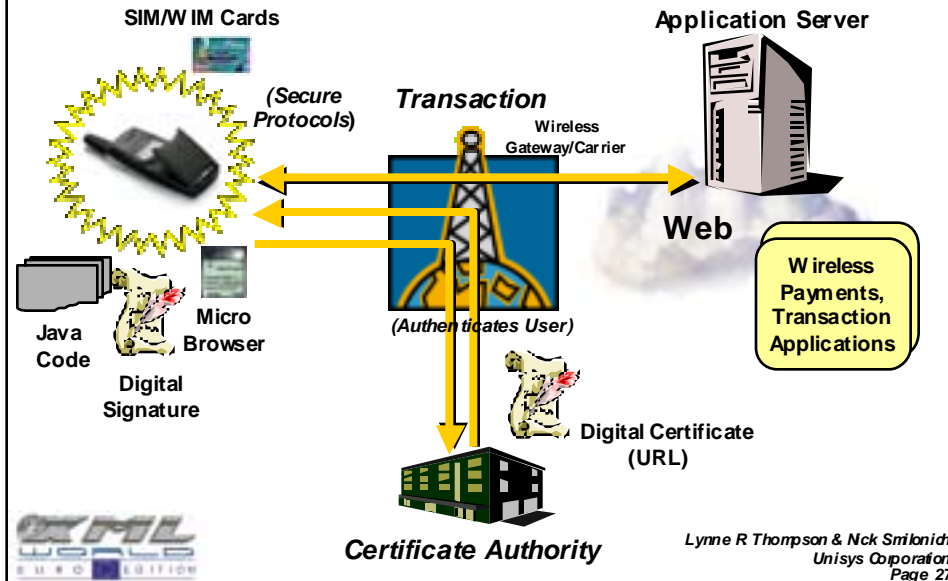
m-Commerce Smart Cards

- SIM (Subscriber Identity Module)
 - Identifies subscriber to network
 - Nail-sized "baby" chip card currently used in all GSM and soon CDMA phones to identify the subscriber to the network
 - Can be used for billing information
- WIM (Wireless Identity Module)
 - Identifies the buyer
 - Can contain digital certificate for authentication
 - Support electronic signatures
- SWIM (Combined SIM-WIM cards)



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Security and Transactions



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m-Commerce: A New Business Approach

- Evolution to wireless data services
- New Business = New Thinking
- New types of mobile usage & user segments
- New services based on content provisioning
- New concepts (Wireless ISP, Wireless Portals, WASPs, ...)
- Pre-3G changes are necessary



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Business Necessities

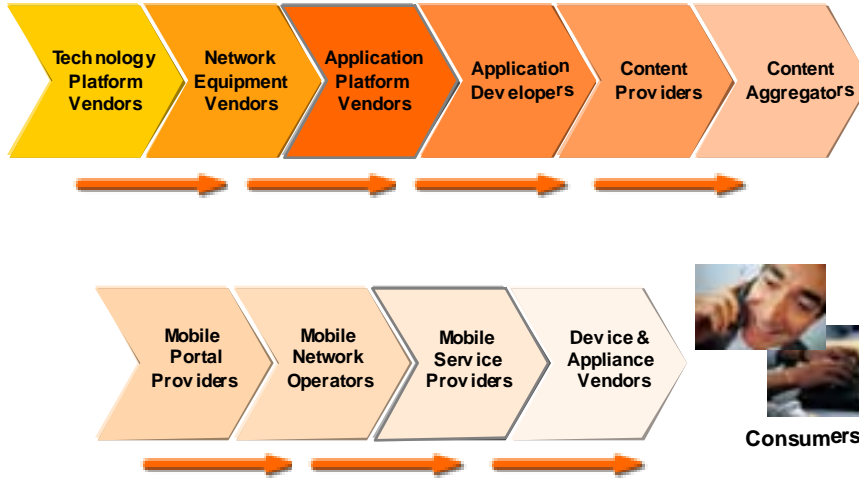
- Brand Recognition
- B2B, B2C Infrastructure
- Partnerships
- Business ROI Models
- Customer Relationship Management
- Security Plan

Build and validate for m-Commerce



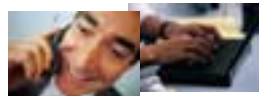
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m-Commerce Value Chain

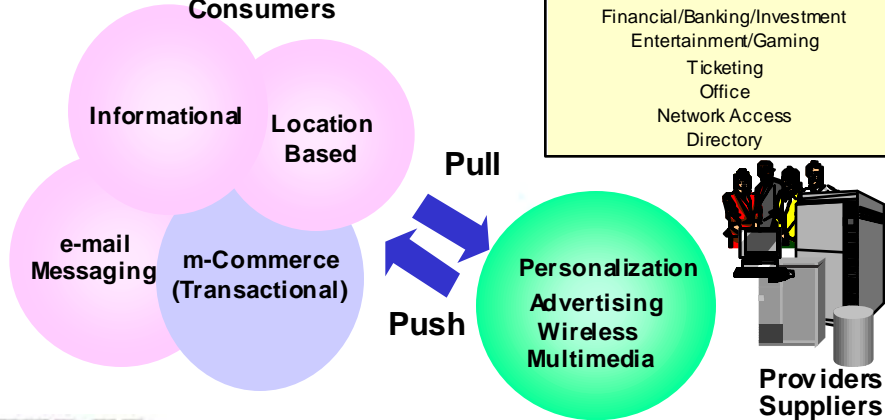


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m-Commerce Application Space



Consumers



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Major Players

- Carriers
 - AT&T Wireless, Sprint PCS, Verizon Wireless, Metricom, Nextel and Voicestream Wireless
- Infrastructure Hardware
 - Traditional telephony networks such as Alcatel, Lucent Technologies and Nortel Networks
 - Specialized Internet and data network such as Cisco
 - Wireless transmission equipment such as Motorola, Nokia, and Ericsson
- Mobile Wireless Devices and Appliances
 - 3COM, Nokia, ...
- Technology Platforms
 - Unisys, Microsoft, GeoWorks, 3COM, Symbian, ...



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Page 33

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- Overview of Mobile Commerce
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Tomorrow's m-Commerce

- **WAP 2.0**
 - TCP substrate
 - XHTML
 - Location-smart services
- **Java J2ME on Devices**
- **Wireless Multimedia**
 - MPEG-4 Codecs and object media
- **2.5G and 3G Carrier Technology**
 - GPRS, W-CDMA
- **Mobile Internet (IP) & Security Standard**
- **Single chip development**
 - Bluetooth, voice, baseband, applications



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m-Commerce Opportunities

Short-Term

- Repurposing of e-Commerce delivery infrastructure for mobile access
- Partnership between content providers & aggregators with mobile portal providers
- Advanced mobile e-mail platforms
- Mobile portals
- Positioning technology
- Sophisticated synchronization applications

Medium-Term

- Model advertising
- Banking Solutions
- m-Commerce Middleware
- Integrating new breed of terminal equipment into corporate B-2-B processes
- Application platforms for MP3-enabled mobile devices as well as video streaming and multi-player games

Long-Term

- Payment solutions
- Mobile passport
- Dynamic information management



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Market Opportunity

“m-Commerce is one of the hottest growth areas in the New Economy”.



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m-Commerce References

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2. **Inside WAP** by Pekka Niskanen
3. **The Net-Works Guide to WAP (Wireless Application Protocol) and WML** by Pete Smith
4. **Professional WAP** by Charles Arehart, Nirmal Chidamharam, et al
5. **Understanding WAP: Wireless Applications, Devices and Services** by Marcel van der Heijden, Marcus Taylor
6. **WAP in Easy Steps** by Mike McGrath
7. **WAP** by Steve Mann
8. **WAP Development with WML and WMLScript** by Paul Cotton, et al



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Page 38

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9. *WAP Servlets W/CD* by Cook
10. *Bluetooth Demystified* by Nathan J. Muller
11. *Mobile IP the Internet Unplugged* by James D. Solomon
12. *Bluetooth Revealed* by Brent A. Miller, Chatschik Bisdikian
13. *Bluetooth: Connect Without Cables* by Jennifer Bray, Charles Sturman
14. *Mobile Communications* by Jochen Schiller
15. *The XML Handbook, Second Edition* by Charles Goldfarb
16. *Professional XML* by Wrox Author Team



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Page 39

Technical Specifications

1. *Wireless Application Protocol (WAP) Architecture*
2. *Wireless Application Environment (WAE) Overview*
3. *Wireless Application Environment (WAE) Specification*
4. *Wireless Markup Language (WML) Specification*
5. *Extensible Markup Language (XML) 1.0*
6. *HTML 4.01 Specification*
7. *XML Base Specification*
8. *XHTML™ Basic*
9. *XSL Transformations (XSLT) Version 1.0*
10. *Cascading Style Sheets (CSS1) Level 1 Specification*
11. *Extensible Stylesheet Language (XSL) Version 1.0*
12. *Handheld Device Markup Language (HDML) Specification*



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Page 40

m-Commerce Links

<http://www.3com.com>

<http://www.ericsson.com>

<http://www.motorola.com>

<http://www.nokia.com>

<http://www.mobilecommerceworld.com>

<http://www.fiercewireless.com>

<http://www.w3c.org>

<http://www.wapforum.org>

<http://www.bluetooth.com>



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Page 41

Acronyms and Terminology

3G	3rd Generation mobile technology according to IMT-2000 standard (e.g. UMTS in Europe)
ARIB	Association of Radio Industries and Business, the standards body in Japan, which also proposed a W-CDMA standard.
ARPU	Average Revenue Per User
ASP	Application Service Provisioning
ATM	Automatic Teller Machine
Biometric	Identification of a person by a physical or behavioral characteristic such as the way they sign their name, their fingerprint or the marks on the iris of their eye
Bluetooth	Chip technology enabling seamless voice and data connections between a wide range of devices through short-range digital two-way radio.
CB	Cell Broadcast

Sources: <http://wireless.berkeley.edu/glossary.shtml>
<http://maffin.net/mobilecommerce/glossary.htm>



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Page 42

Acronyms and Terminology

CDMA	Code Division Multiple Access. A generic term applied to a spread spectrum digital air interface technology that tags segments of a transmission with a code.
cdmaOne	The Interim Standard-95 CDMA standard, coined by the CDMA Development Group and based on technology developed by Qualcomm
cdma2000	A 3G standard principally pushed by Qualcomm and the CDMA development Group that would be compatible with cdmaOne.
CDP	Cellular Digital Packet Data
CRM	Customer Relationship Management
DES	Data Encryption Standard (or Data Encryption algorithm): the most widely used method for "symmetric" encryption The main source is ANSI X3.92.
EDGE	Evolved Data for GSM Evolution. Allows networks to meet many of the requirements for UMTS
EMPS	Electronic Mobile Payment System



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Page 43

Acronyms and Terminology

EMV	Europay-Mastercard-Visa specifications for chip-based payment cards. EMV 1 corresponds with (and generally conforms with) ISO 7816 parts 1-5; the other parts of this specification cover the details of a standard credit/debit application and the requirements for terminals
ETSI	European Telecommunications Standards Institute. Sets network standards in Europe and backs a W-CDMA proposal.
GSM	Global System for Mobile communications, a digital transmission technology, elements of which would be combined with CDMA in the W-CDMA proposals.
GPRS	General Packet Radio Services
GPS	Global Positioning System
HDML	Handheld Device Markup Language. Written to allow Internet access from wireless devices such as handheld personal computers and smart phones. Derived from hypertext markup language. One version of HDML is Unwired Planet Inc.'s UP.Link



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Page 44

Acronyms and Terminology

ITU	International Telecommunication Union, the United Nations body that ultimately will recommend a 3G standard or standards.
IMT-2000	International Mobile Telecommunications-2000, an initiative of the Geneva-based ITU, which outlines the requirements for national standards setting bodies.
PKI	Public Key Infrastructure
SET	Secure Electronic Transactions: a standard for credit card payment across networks, which does not depend on the security of the network and does not allow the merchant access to the customer's card number. It also links the payment to a specific sale transaction. SET does not require the use of a smart card
spread spectrum	Radio transmission technology that "spreads" information over greater bandwidth than necessary for interference tolerance
SIM	Subscriber Identification Module. Smart card holding the user's identity and telephone directory. SMS-Applications may reside on the SIM



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Page 45

Acronyms and Terminology

SMS	Short Message Service. Facility for sending text messages on GSM handsets
SSL	Secure Socket Layer. A form of data encryption used in computer based transactions
TD-CDMA	A 3G proposal combining elements of TDMA and CDMA.
TDMA	Time division multiple access. A digital air interface technology using time-delineated segments for radio transmissions.
TIA	Telecommunications Industry Association, a trade group that sets standards in the U.S. through its TR45 committee.
UMTS	Universal Mobile Telecommunications System, a term used by ETSI to refer to future mobile access to public network services.
UWCC	Universal Wireless Communications Consortium, supporting a 3G standard using TDMA.
WAP	Wireless Application Protocol. Offers internet browsing from wireless handsets
W-CDMA	Wideband CDMA. Normally used to identify the proposed 3G standard from the European Telecommunications Standards Institute and not necessarily compatible with cdmaOne



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Page 46

The End

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