Wireless Data in Businesses

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Definition
Wireless Data Definition

- Data over wireless link
- Two-way communication
- Commercial, "public" service
- Individual users
Not Included

- One-way paging, analog cellular
- Text TV or any other broadcasting
- GPS
- Citizen band radios
- Transmission like -backbone services
- Microwave radio links

- Hybrid systems - data on demand over broadcasting:
  - Internet over DAB, GSM as control channel
Two-Way Wireless Data

Packet Data Networks
PMR/Trunking networks
Wireless LAN
Cordless
Cellular
Satellite

Vertical applications
- systems solutions

Horizontal applications
- high volume

* proprietary specifications
* no operators, fast development
* standards required

Short distance/Office
Wide Area
History
History of Radiotelephony

- Satellite
- Cellular
- Cordless
- Trunking
- WLAN
- Packet data
- PMR/SMR

Public radiotelephony
Public packet data

- Idea
  - Cellular is for voice but not supporting data
  - Data must be mobile

- Systems:
  - Mobitex (Ericsson)
  - Ardis (Motorola)
  - CDPD (IBM, AT&T)

- Network
  - Wide area networks like in cellular
  - Data only services, packet communication
  - Data rate up to 20 kbps, shared channel

- Terminal
  - Own radio
  - Modular and integrated products

Total failure:
- wrong timing
- number of mobile computers
- Internet "only" in universities
- e-mail not in wide use
- technology in principle OK

=> market was not ready!
First 15 Years of Cellular

Growth of Cellular Industry

Mobile voice communication for everybody
Wireless Data

Adding mobile non-voice communication for everybody

Part of the cellular/wireless evolution, where services are available in public networks known for consumers
1) Products with Nokia UI: 9000, 8110i
2) Products with PC industry spec.: Card Phone, Data Suite
Wireless Data for the Next Decade

- Satellite Wireless Data - a niche market
- Two-way paging - cellular messaging is the winner
- Cordless - "old technology and paradigm"
- PMR/Trunking - in front of digitalization, will follow the digital cellular
  - Potential for "vertical" wireless data applications

- Cellular - the volume leader in wireless business and moving towards higher data rates, up to 2 Mbps
  => Extremely good platform for certain segments of wireless data business
- WLAN - the technology leader with innovation and development
  => Opportunity for new business development
- Short distance radios - Bluetooth, focused on personal connectivity
Evolution towards personal multimedia

The 3rd generation standardization is driven by the vision of the future wireless data needs

3G Mobile
- Videotelephony
- Infotainment
- Media
- Inter/intranet
What is required for WLAN connection

- WLAN (Wireless Local Area Network) is an extension to existing local area network using radio technology

![Diagram showing components of a WLAN system]

- WLAN PC Card
- Radio Access Point
- Firewall
- Internet
- Telephony Server
- WWW
- E-mail server
- Wireless connection: ~ 100 m
Bluetooth and Connectivity

Personal area network: voice and data supported!
Wireless Goes Everywhere

Three horizontal layers of wireless networks with different performance, tariff structures, business dynamics and roles

- Regional/global cellular
- Global WLAN
- Global LPRF (BlueTooth)

- Wide area
- Access zone
- Personal zone

Various wireless access methods are complementing each others

Segmented intelligent multiaccess terminals:
- speech and messaging
- “multimedia”

Customers want:
- total mobility with seamless scaleable services and optimized cost structures
Two Major Trends in Wireless Industry

1) From circuit switched to packet switched

2) Higher data rates over radio
**U.S.-originated traffic loads of carriers based in the United States**

Terabytes/day (in thousands)

- **Internet**: *Also includes peered traffic originated internationally*
- **Voice over IP**
- **Data**
- **Circuit switched**

Source: Renaissance Analysis
(reverse engineered from Red Herring)
Future of Wireless Data is bright but...

- The playing field is completely different than in the past
- Rules will partly come from the computing world - however, wireless is the volume driver
- Voice and data will converge into a wireless IP communication
  - Data will eclipse the voice
- Complexity will increase
- Multimode - a dream but still a mess of standards
- New service players are needed
- Segmentation of applications
Business segments
Segments

- Content
- Applications
- Terminals
- Networks
Wireless Networks Under Transition

For the fast development wireless industry will accept "the open computing model"

=> Pure IP
WD Shaping Terminals

Modular concepts

New segments, image messaging

Integrated products
WAP: Platform for New Applications

- E-Commerce
- Product Inventory
- Remote Calendar/Contact Sync
- Internet
- Infotainment
- Corporate Intranet
- Localized services
- E-Mail
WAP Servers for Various Applications

Corporate network

- Application Server
- Database
- WEB Server
- Desktop PC
- Nokia WAP Server

Operator network

- SMS or Data Call
Application Segments

• Horizontal
  • e-mail, messaging
  • Internet/Intranet access
  • banking
  • telefax

• Vertical
  • courier, transportation
  • taxi
  • real estate, insurance
  • sales applications, inventory management
  • remote control, alerts

=> new business segment

Downloading new applications over the wireless links
Content

• Personal communication:
  • With fast access to Internet, e-mail, photo albums, video cameras etc. we can start to share more and more => communication and presentations are "converging"
  • Communication content is created, used once and disposed of, recording is an additional task today => autostore of communication for potential future need
  • Transaction logs: calls, messages
  • e-mail, calendar, e-commerce
  • personalized services, mobile agents
• Mobile content:
  • news, weather, sport results, finance
  • location based services/content, intelligent search
  • timetables with changes, catalogues
  • entertainment, games, e-lottery
  • advertisement
  • reduces Internet content
  • mobile portals

Independence of time and location

Customized for mobile users

Personalized services, the biggest segment
Conclusion

Wireless industry is in the beginning of a new phase, where voice is a commodity and wireless data, in various ways, is the value adding element in products, applications and services