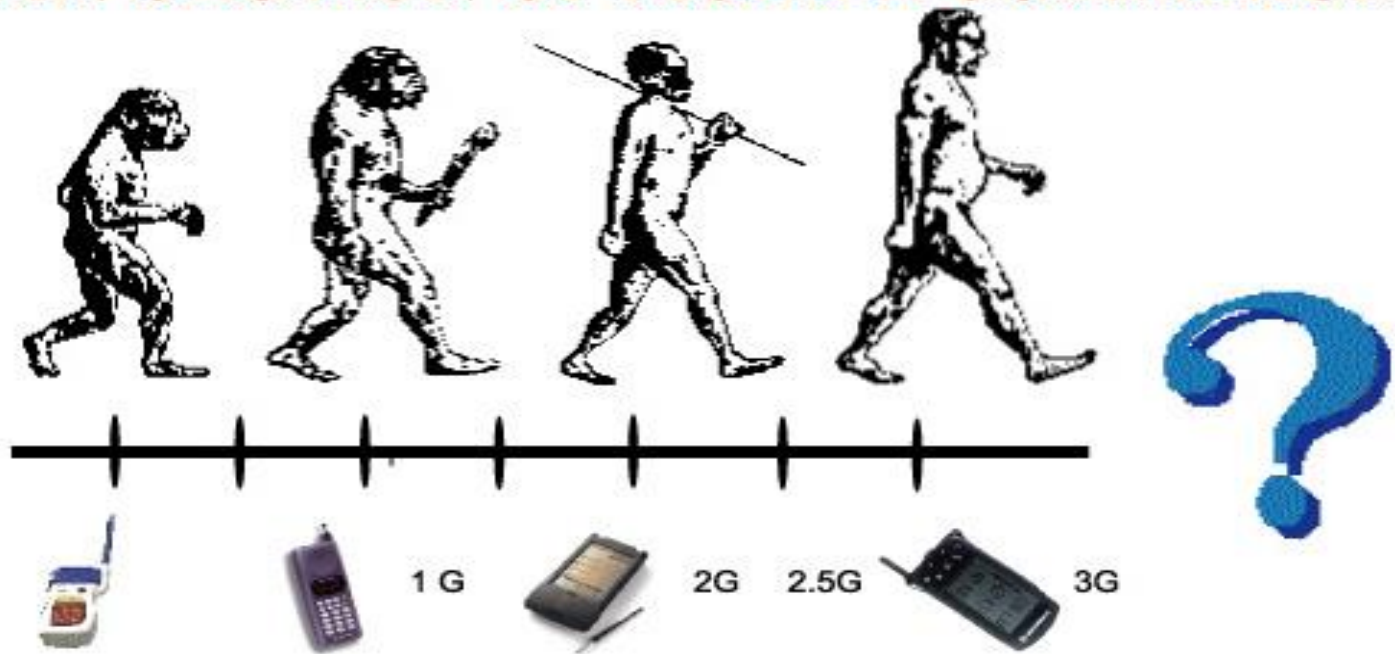


# Mobile Commerce

## THE EVOLUTION OF MOBILE COMMERCE



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# Outline

- Introduction
  - Characteristics of M-commerce
  - Enabling Technologies
  - Mobile Payment
  - Conclusion
-

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# The Drivers

- Widespread availability of devices
  - No need for a PC
  - Handset culture
  - Vendors' push
  - Declining prices
  - Improvement of bandwidth
  - Explosion of EC in general
-

---

# Mobile Commerce: Overview

- Mobile commerce (m-commerce, m-business)—any e-commerce done in a wireless environment, especially via the Internet
    - Can be done via the Internet, private communication lines, smart cards, etc.
    - Creates opportunity to deliver new services to existing customers and to attract new ones
-

# Mobile Interfaces



---

# Classification of M-Commerce Services

- Financial
    - e.g. Secure banking services
  - Entertainment
    - e.g. Mobile Gambling
  - Shopping
    - e.g. Purchase of goods
  - Information
    - e.g. Local Information
  - Payment
    - e.g. Electronic Wallet
  - Advertising
    - e.g. Intelligent Advertising
-

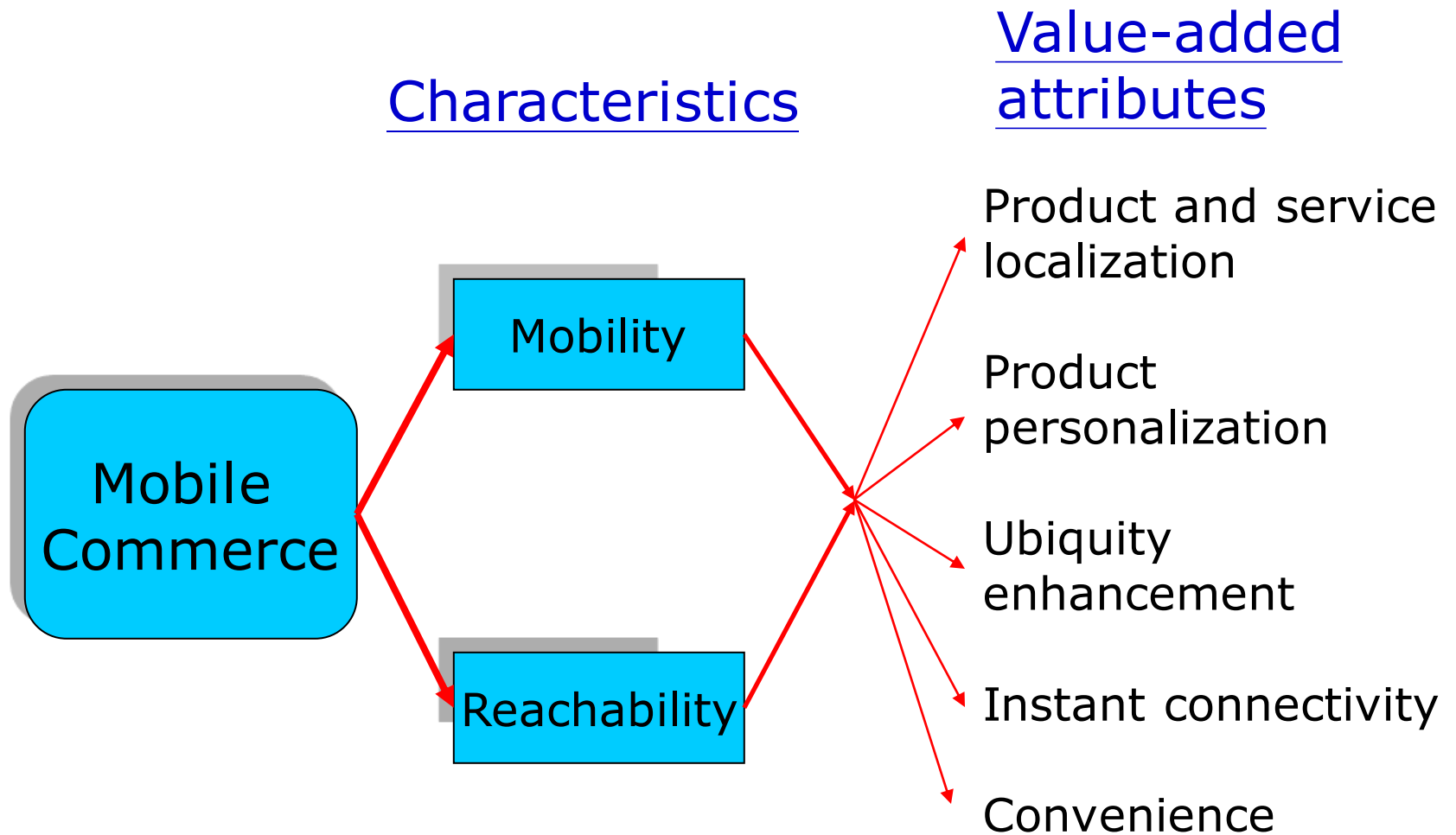
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-



# Characteristics of M-Commerce



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# A Example (The next bus model)

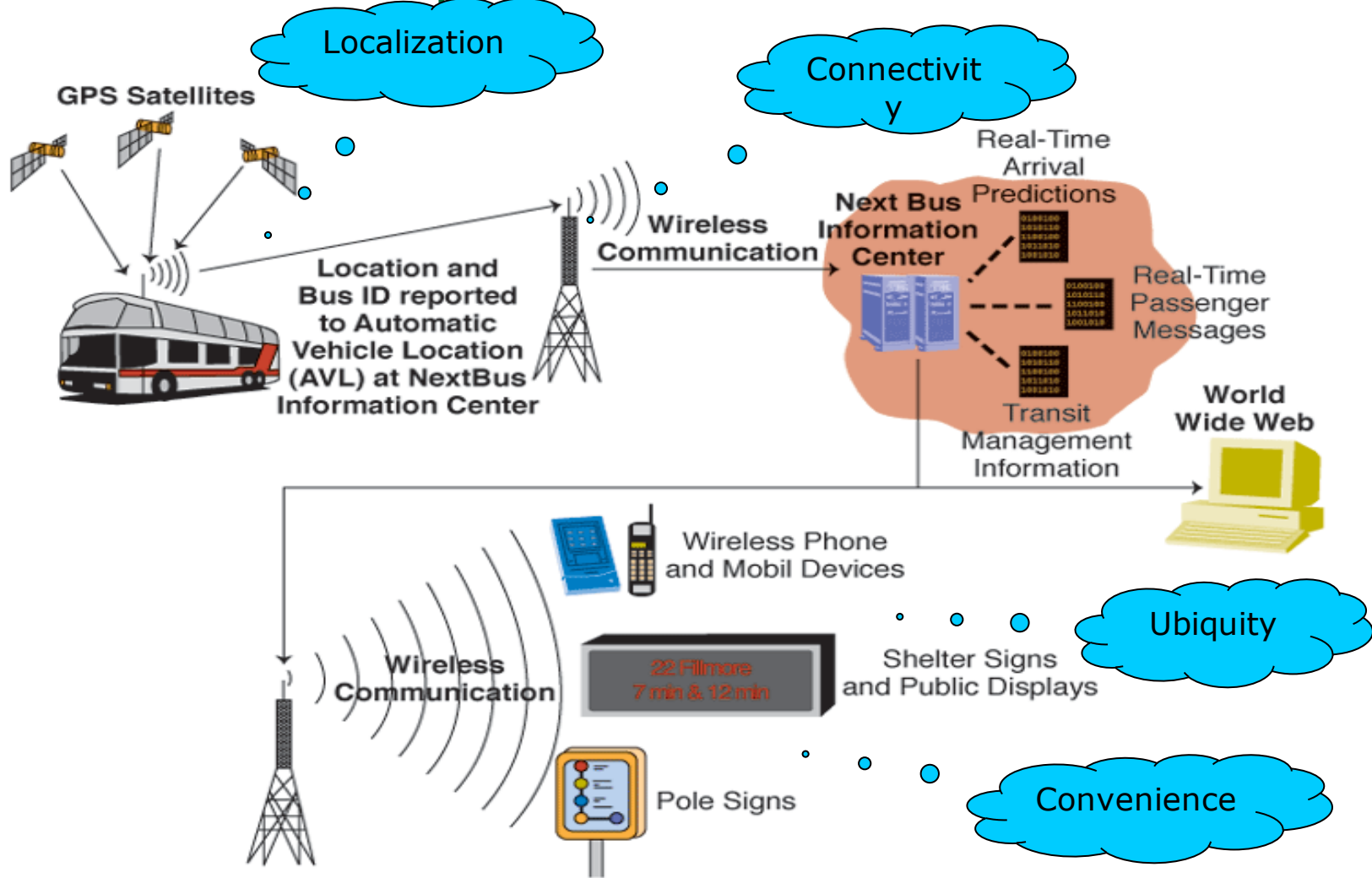
- The Problem

- Buses in San Francisco have difficulty keeping to 20 minute schedule during rush hours
- Posted schedule becomes meaningless

- The Solution

- Bus riders carrying Internet-enabled cell phone or PDA helps:
    - Find estimated arrival time at each stop, digitally in real time
    - Soon location-based advertisements will pop up—you have time to get a cup of coffee before the bus arrives—Starbuck's is 200 feet to the right
-

# NextBus Operational Model



Source: [NextBus.com/corporate/works/index.htm](http://NextBus.com/corporate/works/index.htm), 2002. Used with permission of NextBus Information Systems.

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# NextBus *(cont.)*

## ■ The Results

- Passengers in San Francisco are happy with the system
    - Worries about missing the bus are diminished
    - May discover they have time for a cup of coffee before the bus arrives
  - Bus company can:
    - Schedule better
    - Arrange for extra buses when needed
    - Improve operations
-

---

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# Enabling Technologies

Introduce two transmission mode, GPRS and W-CDMA

- GPRS (General Packet Radio Service)
    - A step between GSM and 3G cellular networks.
    - Transmission rate via a GSM network within 9.6Kbps ~ 115Kbps.
    - GPRS supports the widespread range of bandwidth, it is a effective application under the limited bandwidth.
    - Mobile phone can receive and transmit data at the same time.  
(e.g. make a phone call and receives e-mail at the same time)
  - W-CDMA (Wideband Code-Division Multiple Acces)
    - the transmission technology for third generation (3G) UMTS mobile communication.
    - The transmission rate is up to 2Mbps, it makes mobile multimedia grows rapidly.
-

---

# Enabling Technologies (*cont.*)

## WAP(Protocol) and i-mode(Service)

- WAP(Wireless Application Protocol)
    - It is a open and standard wireless application software protocol.
    - The WAP system are composed of two main factors :
      - WML ( Wireless Markup Language ) : similar to HTML
      - WAP Gateway / Proxy : to change the webpage source code to the suitable one.
    - Need a connecting action
    - Payment according to time used.
  - i-mode
    - The first packet-based, always-on, mobile Internet service
    - Various services available : Banking, game, wallpaper, music....
    - Payment according to packets received.
-

---

# Enabling Technologies *(cont.)*

- Other related technologies

- J2ME (Java 2 Micro Edition)

- A kind of programming language used in small, connectable consumer and embedded devices. it makes mobile phones have a ability to execute program.

- XML ( eXtensible Markup Language )

- A Standard for structured document interchange on the Web. It makes the description language used by different browsers can be changed more quickly.

- IPv6

- IPv4 use 32bit, this is not enough. IPv6 expand it to 128bit, so that every mobile phone can get its own IP.

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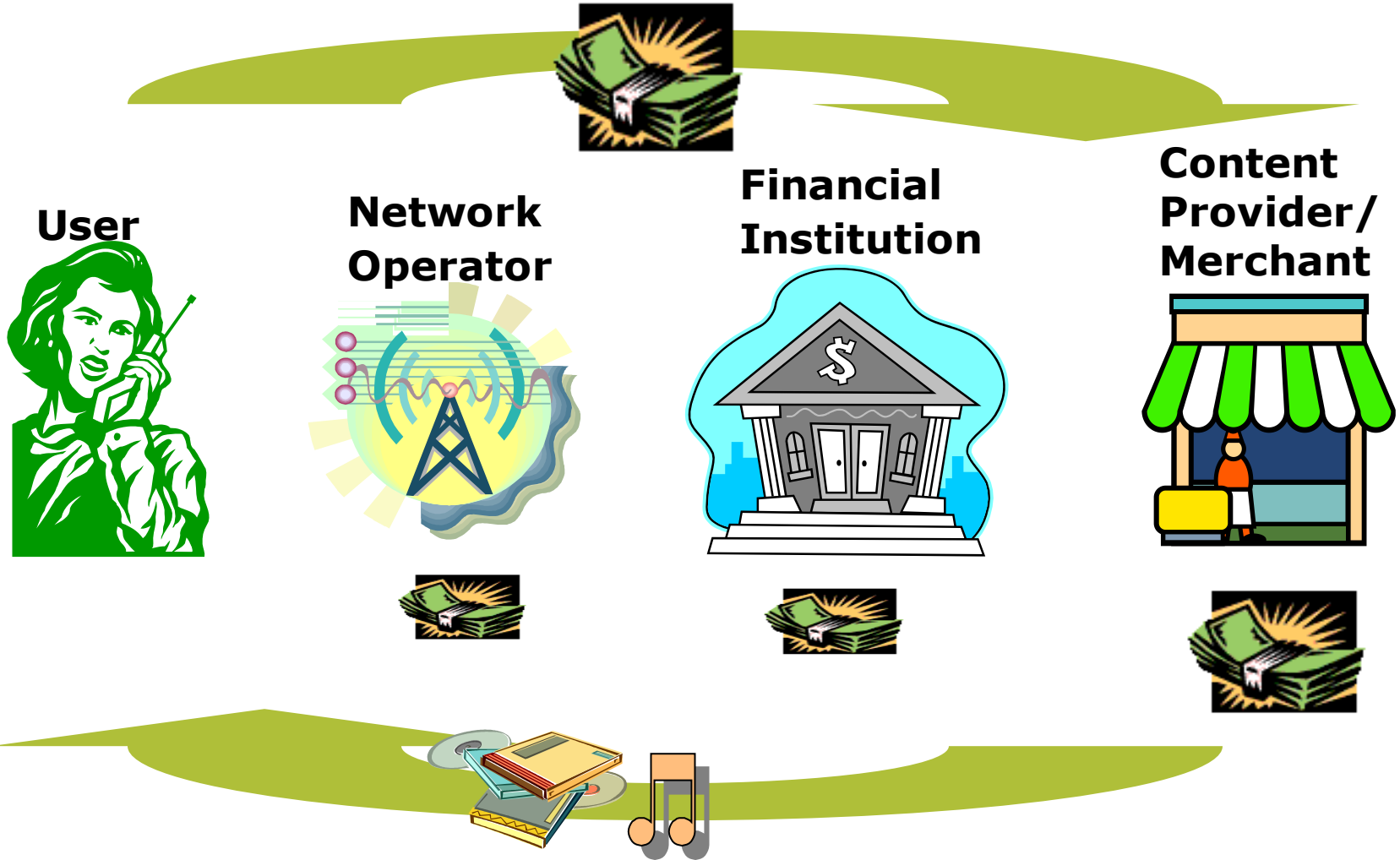


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# Mobile Payment Players

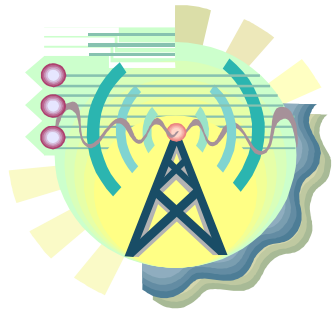


# Mobile Payment Issues

## User



## Network Operator



## Financial Institution



## Content Provider/ Merchant



- Security
- Privacy
- Ease of Use
- Devices

- Open Standards
- Inter-operability
- Roaming

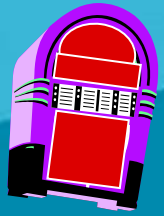
- Authentication
- Integrity
- Non-repudiation
- Fraud reduction

- Getting Paid
- User adoption
- Low Cost

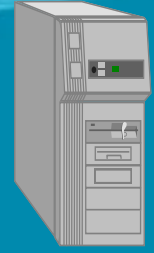
Issues

# Mobipay system

Vending Machine



OR



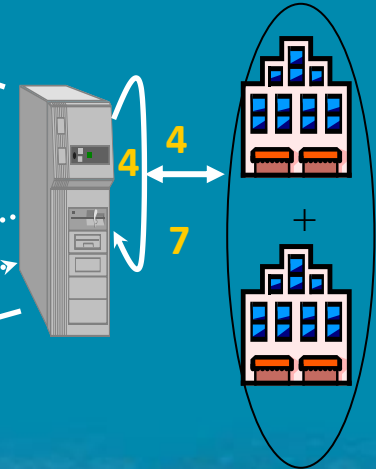
Internet Merchant

Product .....  
REF. 1234



Mobipay System with Access Node router

Processor + Issuer/ Acquirer



REF 010  
Delivery REF 1234  
Store x OK  
Alte + P



User

1. User chooses Mobipay payment method on merchant site
2. Merchant sends unique Mobipay reference associated with amount
3. User sends reference (+ PIN)

4. Data validation
5. PIN request
6. PIN response
7. Authorisation
8. Confirmation

If PIN not entered directly

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# Conclusion

- Meteoric growth of the Internet and mobile communications
- Increasing mobility
- New applications, services and business models
- Enabling technologies

**Annual growth  
1990-1999**

**6%** Telephone  
lines

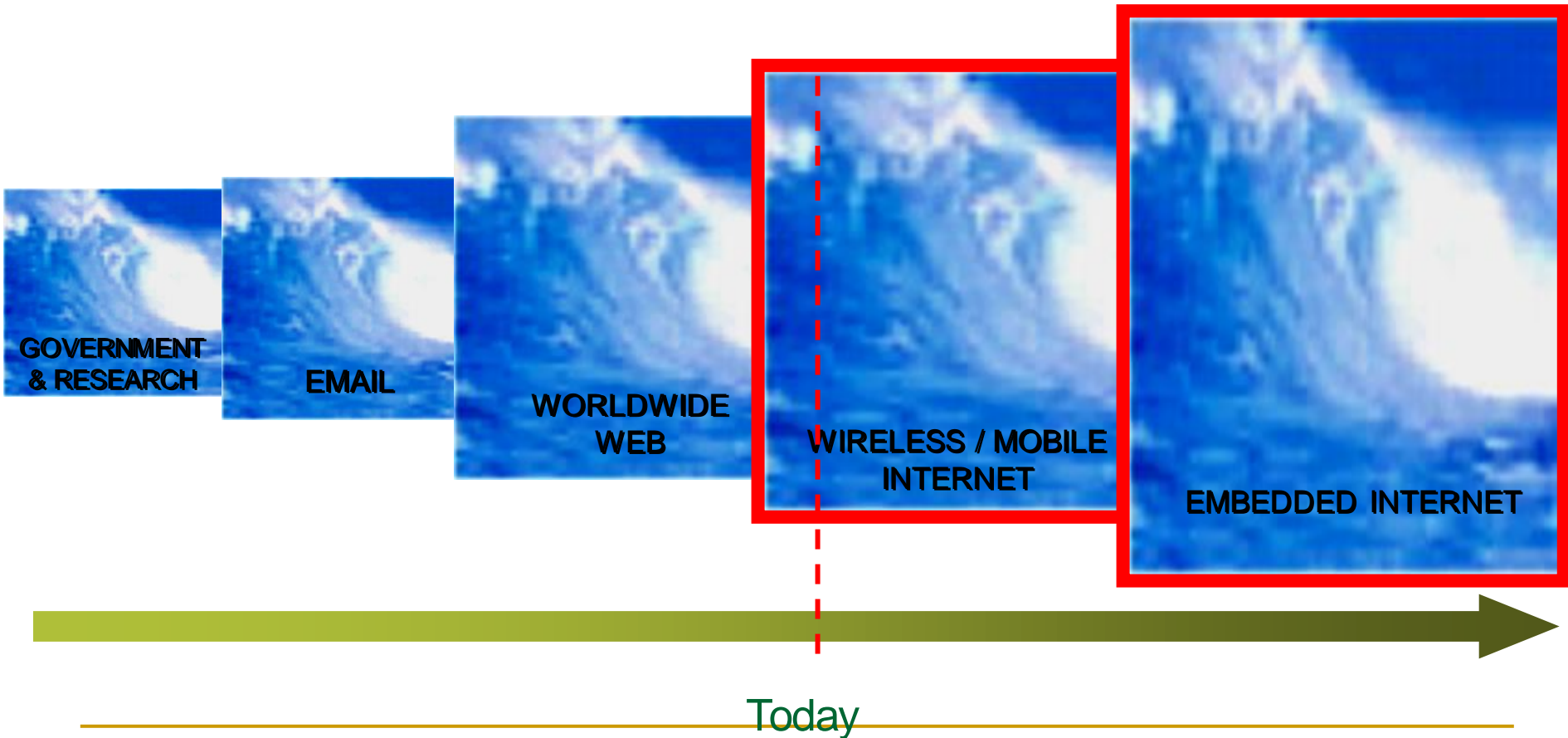
**Cellular  
subscribers**

**52%**

**Internet  
hosts**

**87%**

# Internet Waves



Today

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Thank you for your  
attention!

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# Reference

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  - <http://www.fenestrae.com/>
  - <http://www.ti.com/tiris/docs/applications/pos/retail.shtml>
  - <http://www.ericsson.com/technology/>
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