

Wireless Banking (M-Banking)



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Layout of our Presentation

- ▶ **History of Wireless & Mobile Banking**
- ▶ **Wireless Networks**
- ▶ **Wireless Devices (Mobile Phones & PDAs)**
 - Technological Aspect
 - Business Aspect
- ▶ **Security**
- ▶ **World Trends**
- ▶ **Conclusion & Future Opinions**



Early Wireless

▶ Famous Names

- James Clerk Maxwell
- Heinrich Rudolph Hertz
- Guglielmo Marconi

▶ Bell Labs (R&D Organization)

▶ Analogue Systems

▶ Digital Systems

> History

Networks

Devices

Security

World Trends

Conclusion



Wireless Today

▶ **Wireless Technology is steadily bridging the gap between itself and wireline technology**

- Ex. Mobile Phone use compared to land line phone use.
- “1 billion wireless phone subscribers worldwide”
 - Source: Canadian Wireless Telecommunications Association

▶ **Third Generation Wireless Networks**

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Wireless Banking (M-Banking)

- ▶ **Mobile Banking is really a subsection of Mobile Commerce**

- ▶ **First banks to publicly offer Mobile Banking:**

- Worldwide: Svenska Handelsbanken, Sweeden, 1999
- North America: Bank of Montreal in Canada & Harris Bank in the United States, July 2000

- ▶ **Question:**

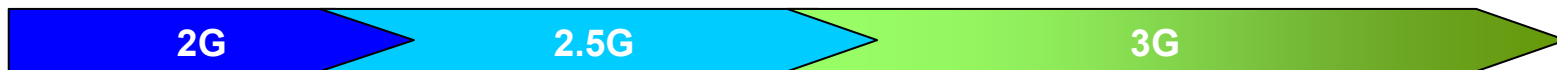
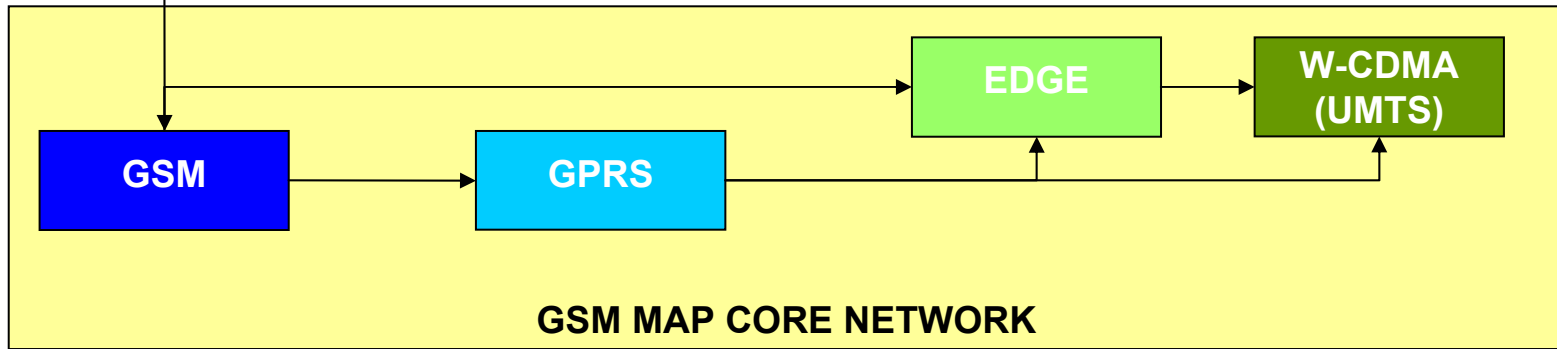
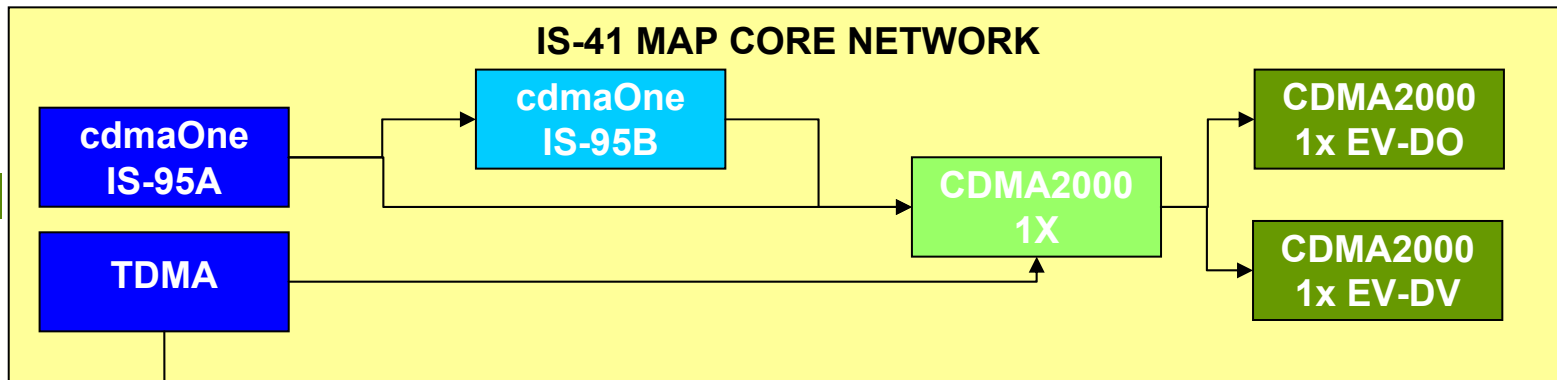
- In creating and encouraging m-banking will these banks in the future be able to obtain feasible returns on their investments?

- > History
- Networks
- Devices
- Security
- World Trends
- Conclusion



Types of Networks

- ▶ Four steps
- ▶ Two major standards



ITU Internet Reports 2002: Internet for a Mobile Generation, <http://www.itu.org>

History
> Networks

Devices
Security

World Trends

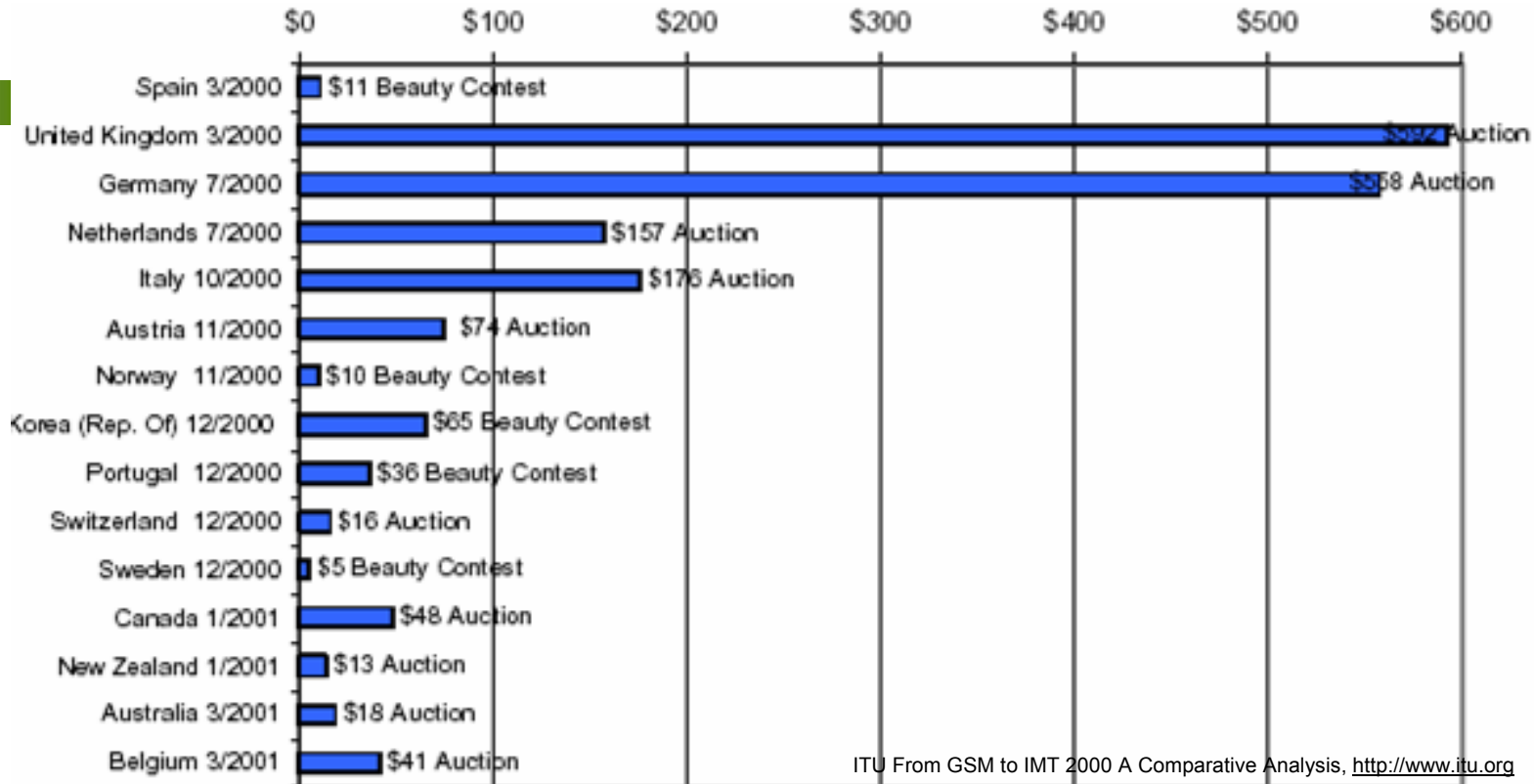
Conclusion



3G Licensing policies

▶ North America

- USA: FCC, auction in mid-2004
 - problem with military frequencies
- Canada: Industry Canada, auction in 2001, reasonable



History

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3G Licensing policies

▶ Europe

- 2000-2001: much of Europe adopted auction method
- United Kingdom, Germany, far beyond expectation

History

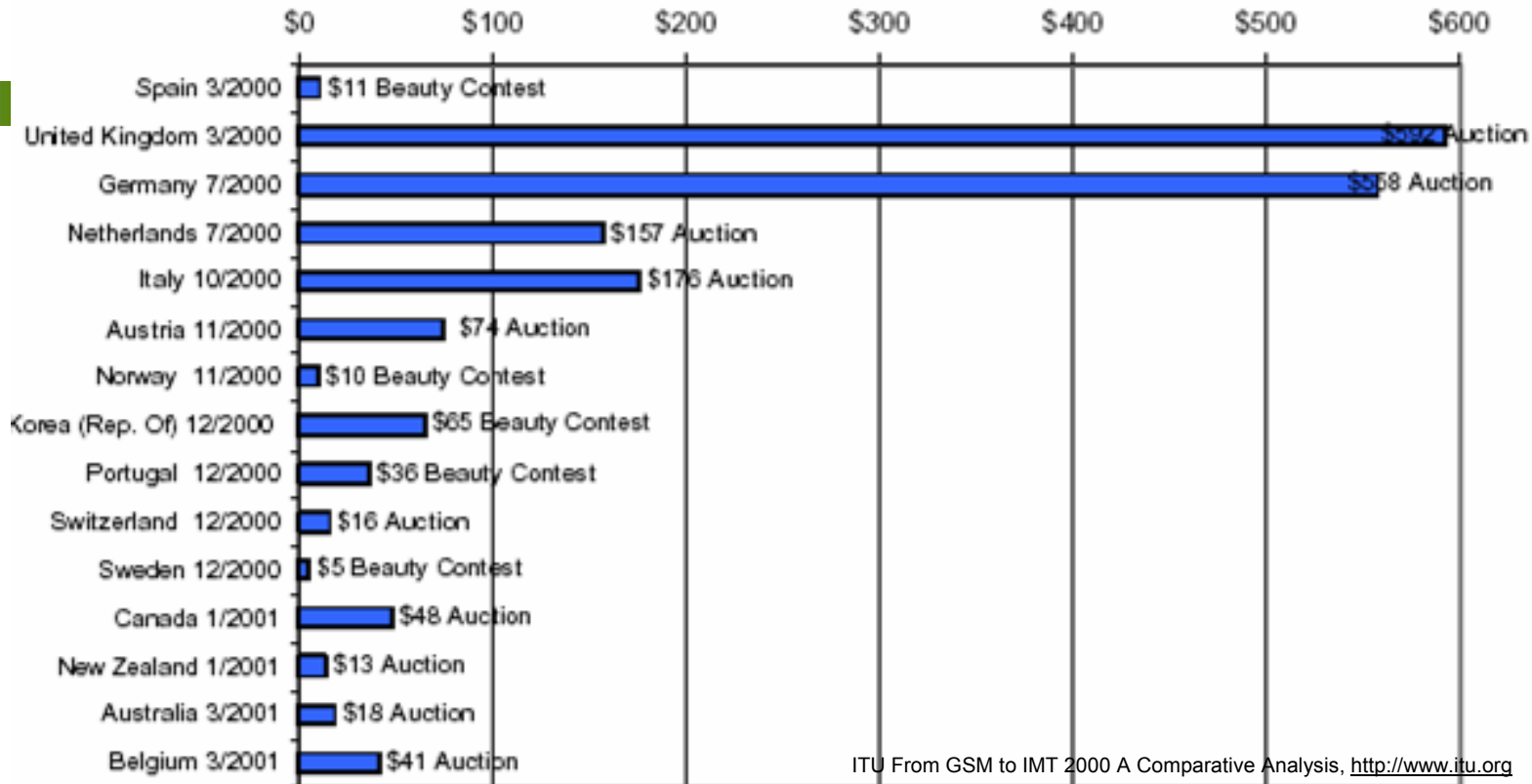
> Networks

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ITU From GSM to IMT 2000 A Comparative Analysis, <http://www.itu.org>



3G Licensing policies

- ▶ Asia
 - Japan, Rep. of Korea: beauty-contest
 - China: hybrid solution
- ▶ Most advanced market

History

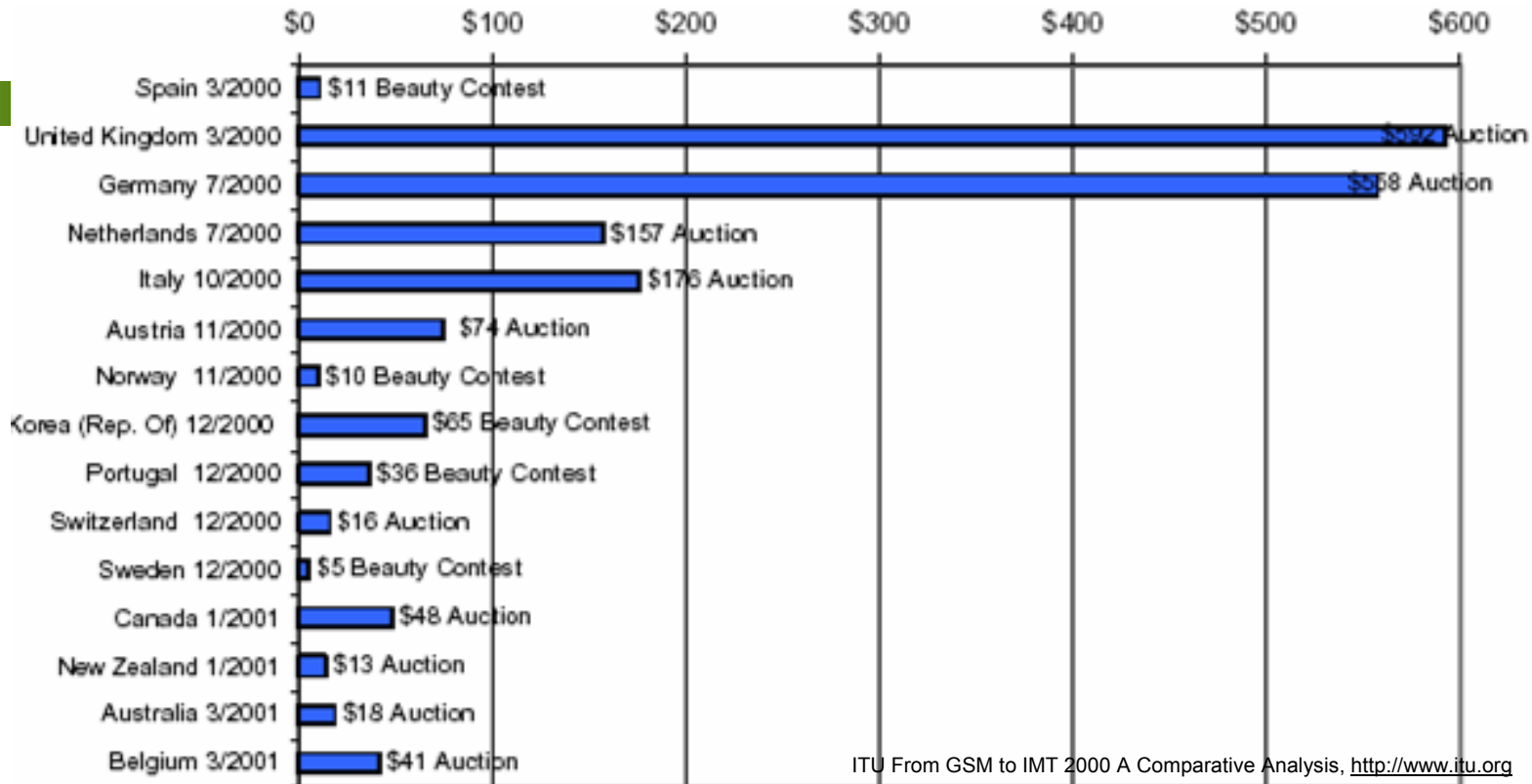
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3G roadmap

History

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- ▶ **Difficult to predict**
 - Delays can occur
 - Auction not already done
 - Cost of licenses
 - Cost of infrastructure

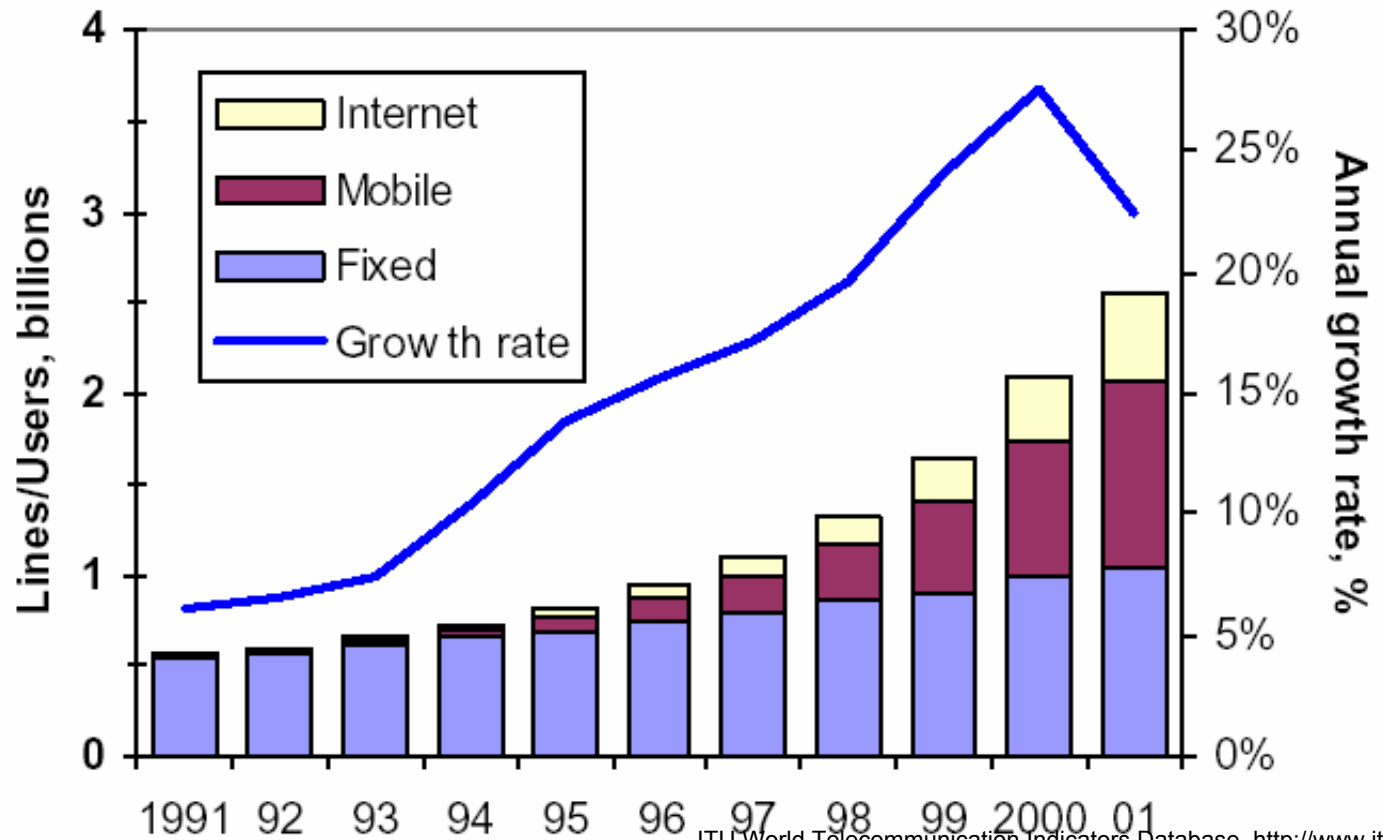
- ▶ **South East Asia**
 - End of 2003
- ▶ **North America**
 - End of 2003 – 2004
- ▶ **Europe**
 - End of 2004



Mobile Users

- ▶ Growth of mobile phone users more important than Internet users

1991-2001



ITU World Telecommunication Indicators Database, <http://www.itu.org>

History

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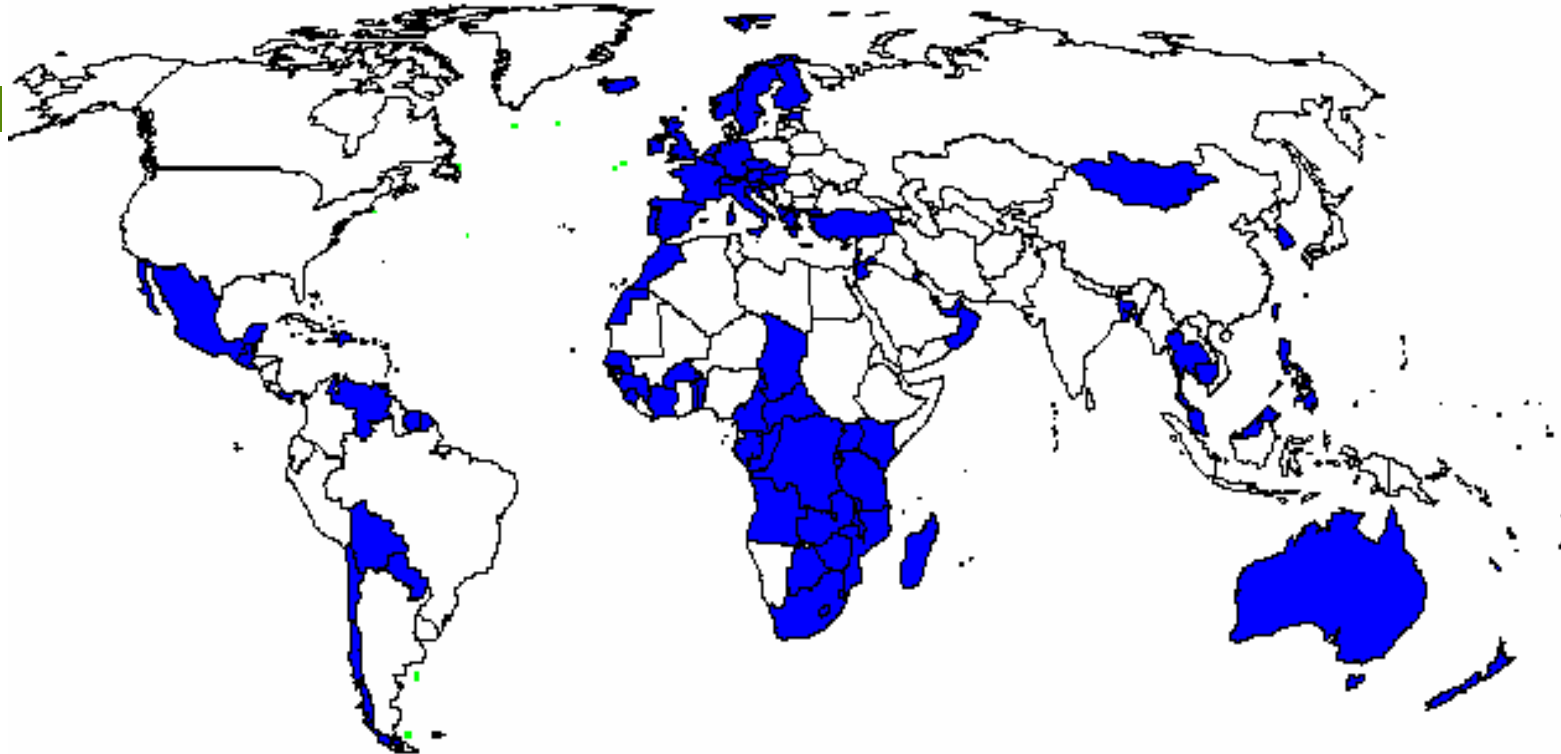
World Trends

Conclusion



Mobile Users

- ▶ 97 countries with more mobile than fixed telephones in 2001



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Mobiles Devices



- History
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What Are Considered Handheld Devices



History

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- ▶ Thin client devices
 - such as Palm, WorkPad, Ipaq

- ▶ Two-way paging devices
 - like RIM

- ▶ Smart phones, WAP phones

- ▶ Others

What they do for Wireless Banking



History

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- ▶ Demonstrates how the simple handheld device can change the way a business operates
- ▶ Offers value-added investing, banking and research
- ▶ Wireless banking main objective and goal was to revolutionize the financial industry

Palm demo



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E*Trade Example

History

Networks

> Devices

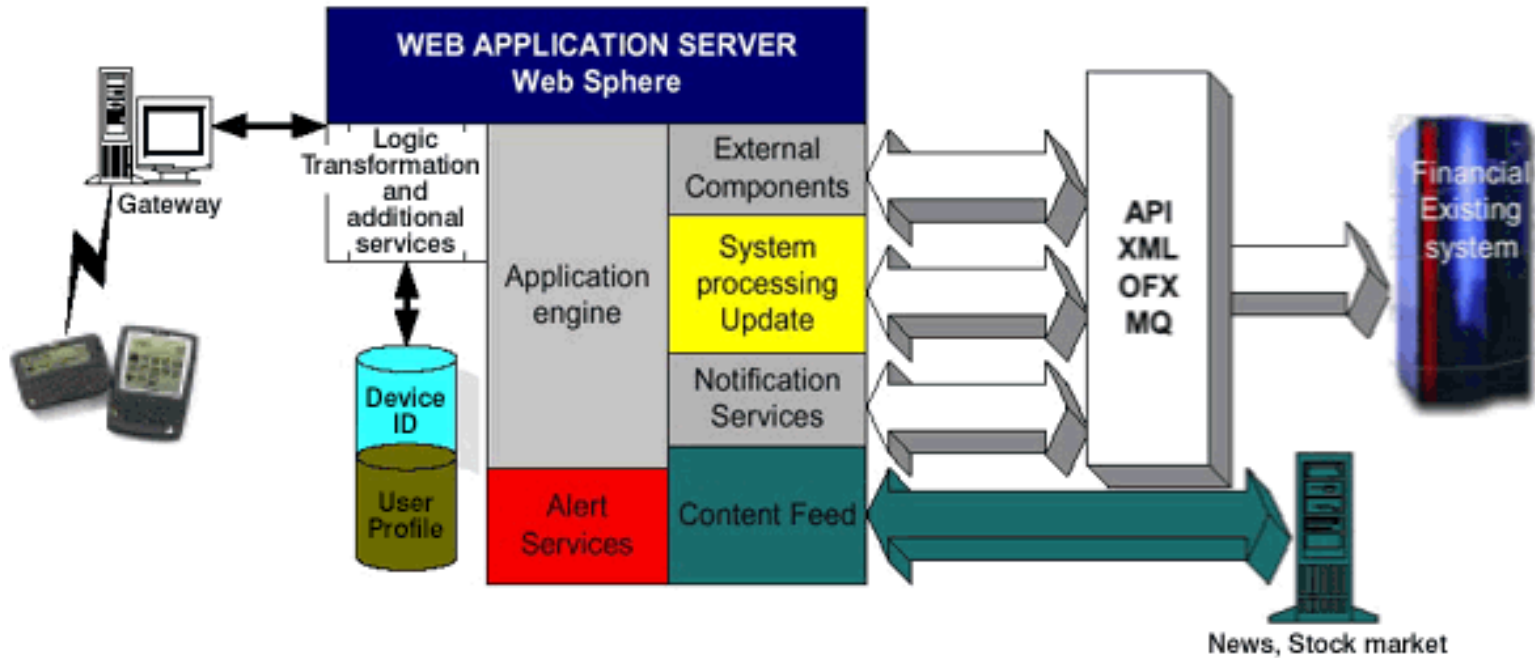
Security

World Trends

Conclusion

- ▶ **E*TRADE is the first online financial services company to offer an integrated wireless brokerage and banking service across all three major platforms**
 - browser-enabled phones
 - Palm OS PDAs
 - RIM Wireless Handhelds
- ▶ **Benefits for the End User.**
 - Extended Trading Hours
 - providing customers with 'on-the-go' access to real-time financial information.
 - Always On, Always Connected(blackberry)

Technology of Handhelds and Wireless Banking



- History
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Mobile Phone Banking Business Aspects



History

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▶ Key Players : Financial Institutions

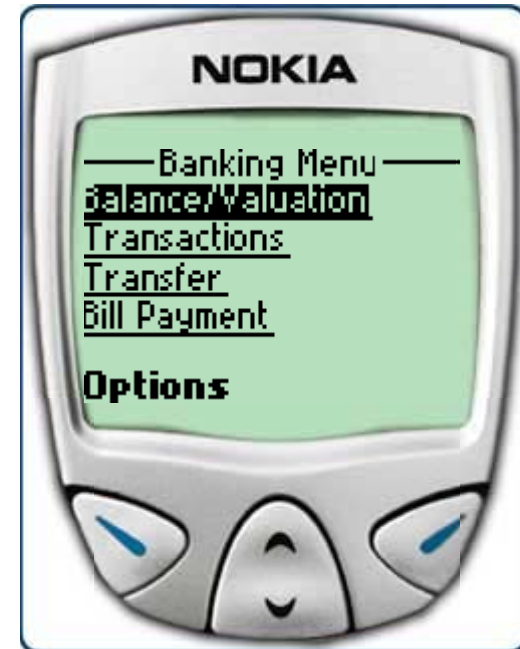
- Deliver Value to clients
- Appropriate Strategy
→ profitable growth (cost-saving)
- Customer Retention

▶ Applications on mobile phones

- Voice
- Data
→ emerging market segment
→ new technologies deployed

▶ Example

- Egg©



Mobile Phone Banking Business Aspects



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- ▶ **Common features available among all banks are**
 - Financial summary of accounts
 - Account balances and activity
 - Transferring of funds between accounts
 - Paying bills, including postdated bill payments
 - Account balance and activity for credit card accounts

- ▶ **Additional features**
 - Brokerage functions (buying/selling securities)

Mobile Phone Banking Technology



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- ▶ **Protocols → CDMA, TDMA, or GSM**
 - Analog voice to digital data conversion
 - Carrier network
 - Similar receive process

- ▶ **Recent Data Applications → Browser-based internet**
 - Similar concept to PCs
 - Protocol used is WAP
 - On the back-end (server-side), conversion of webpages to WML → Understood by phones WAP technology



M-Banking Canadian Arena



History
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- ▶ **TD Canada Trust**
 - Launched June 2000
 - Most Successful.
- ▶ **Scotiabank**
 - April of 2000. Active.
- ▶ **Royal Bank**
 - Still Operational.
- ▶ **CIBC**
 - Last to Launch its Service
 - Available Through all Cellular Providers.
- ▶ **Bank of Montreal**
 - Just Pulled the Plug on their Service
 - Failed to Receive the Return they Expected.





Security

- ▶ 90% of people worry about loss of financial data
- ▶ Expensive
- ▶ SSL encryption
- ▶ X.509 digital certificates
- ▶ Dual secure key authentication
- ▶ LDAPS, WTLS, OCSP

History

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SSL Encryption and X.509



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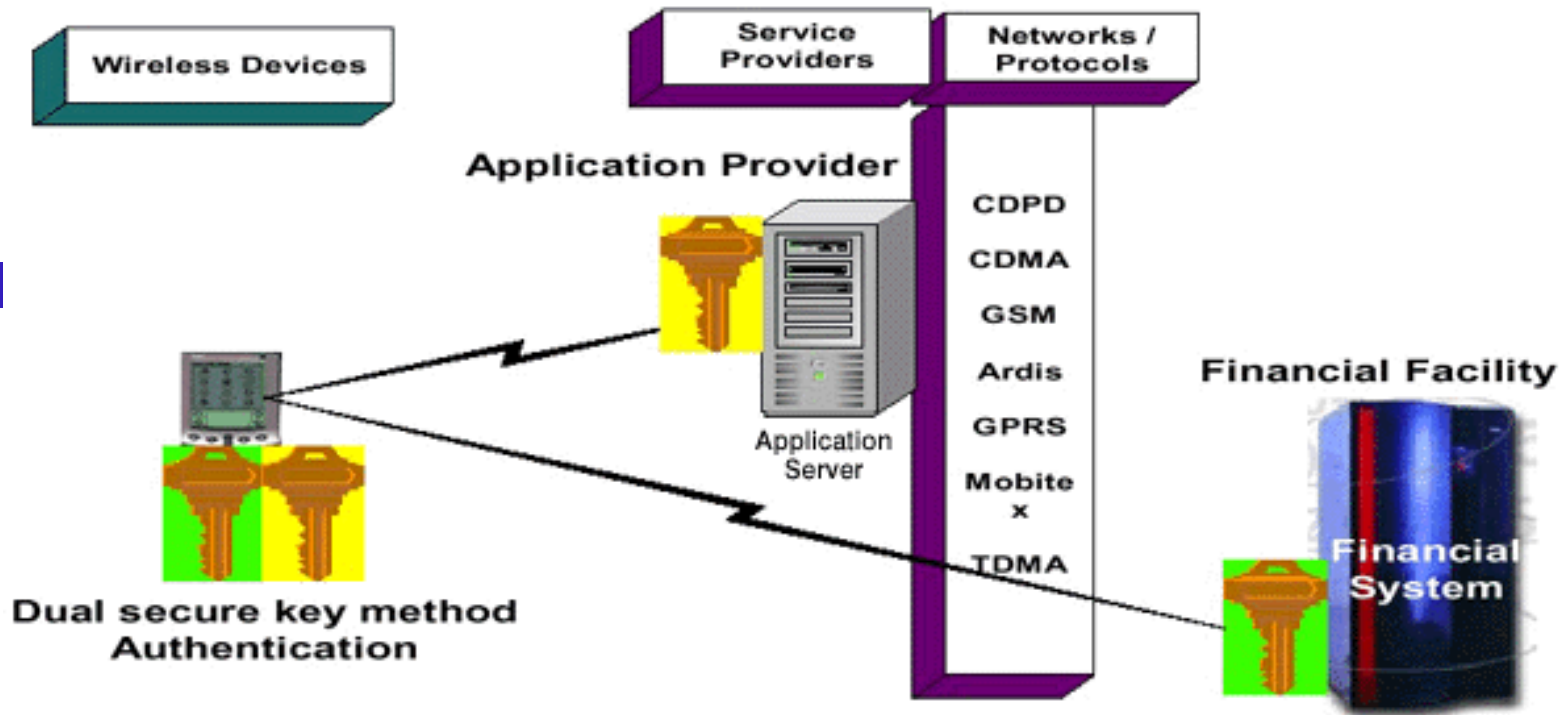
Conclusion

- ▶ Secure Socket Layer authentication
- ▶ RSA cryptography
 - public and private keys
- ▶ X.509 digital certificate
- ▶ Session IDs

Dual Secure Key Authentication



- ▶ Authentication occurs at Financial Institution and at Service Provider



- History
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LDAPS, WTLS, OCSP

- ▶ **Secure Light Directory Access Protocol**
 - X.500 is an alternative

- ▶ **Wireless Transport Layer Security**
 - security layer for WAP

- ▶ **Online Certificate Status Protocol**
 - CRL
 - Certificate Authority

History
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Security for Consumers

- ▶ The mystery behind the terms

- ▶ Online shopping
 - initial predictions
 - failure to meet expectations
 - parallel with mBanking

History

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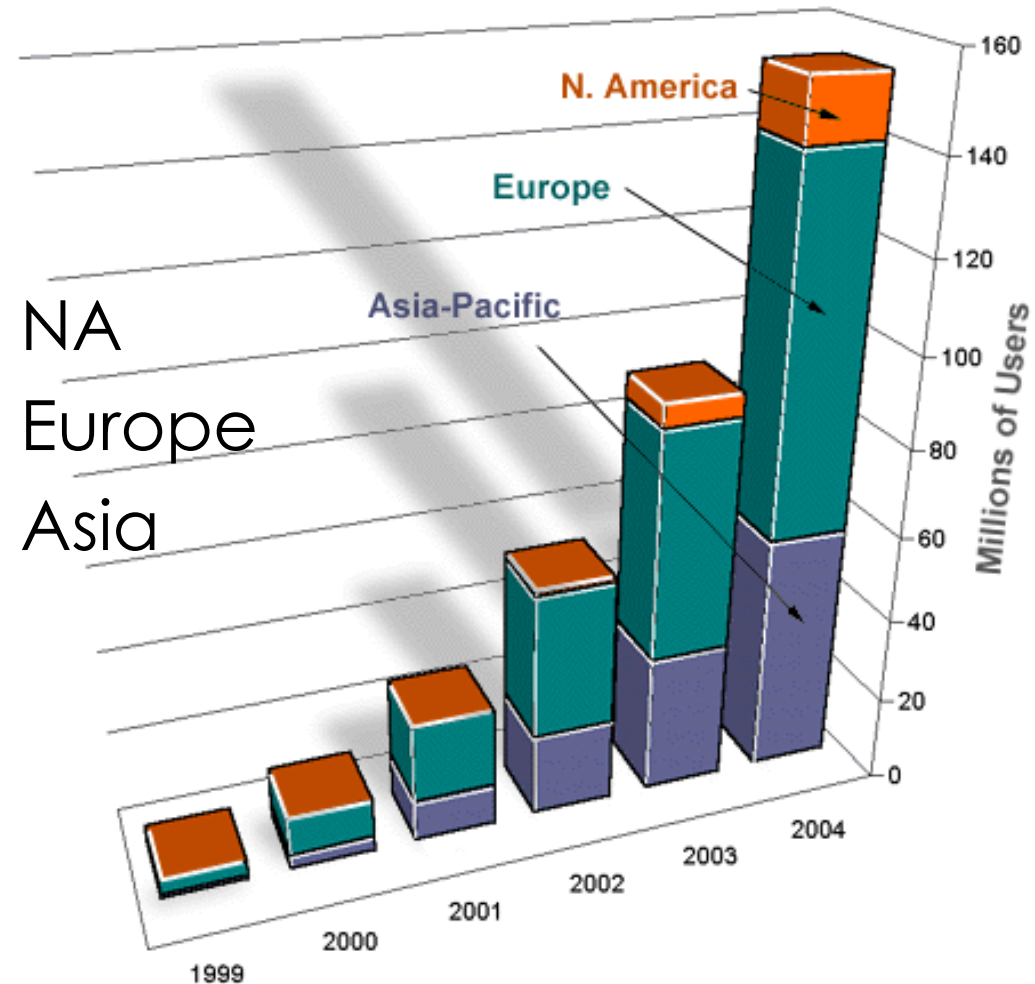
2000: Estimation of mBanking users by 2004



- History
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- ▶ 15 million in NA
- ▶ 80 million in Europe
- ▶ 55 million in Asia

Users of Wireless Financial Services





Europe

- ▶ Mobile phones preferred to PDAs
- ▶ SMS preferred to WAP
- ▶ 2%-6% are planning to use mBanking in near future
- ▶ mPayment is getting popular

History

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North America

- ▶ PDAs and pagers are popular
- ▶ May 2002: CIBC enters mBanking market
- ▶ August 2002: Bank of Montreal shuts down mBanking services in Canada
- ▶ Projects are postponed

History

Networks

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Security

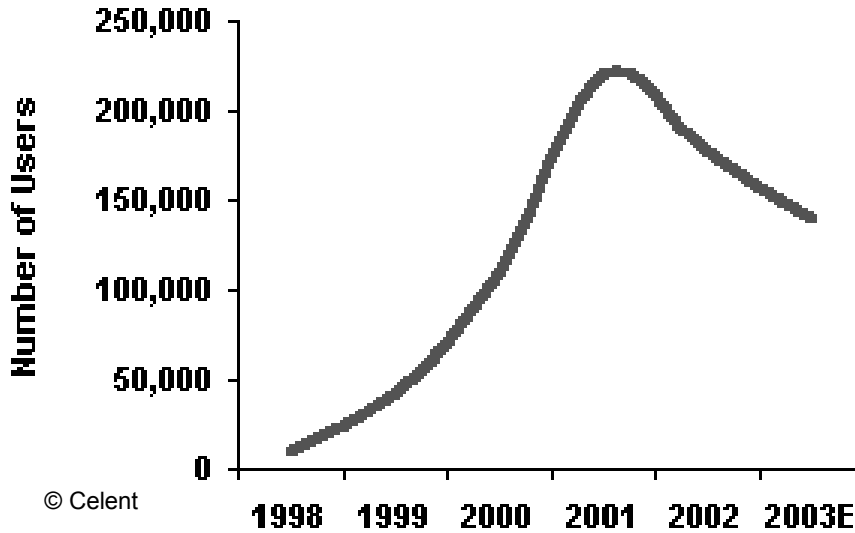
> World Trends

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North America

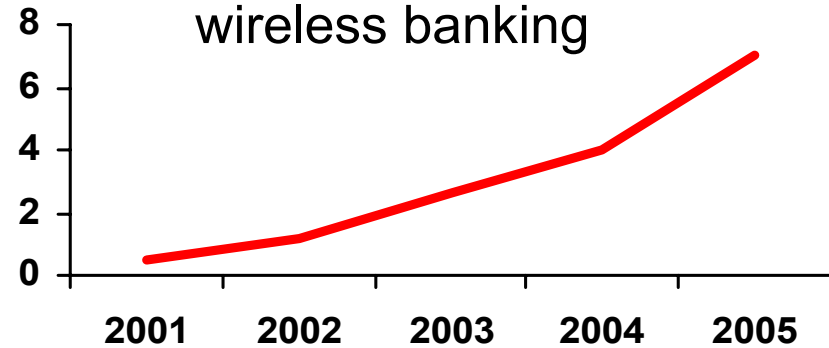


- Wireless Banking & Brokerage Users



© GartnerG2 (data)

- US consumers using wireless banking



- History
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South East Asia

- ▶ Exploding wireless penetration
- ▶ 3G is ahead
- ▶ Banks hook up new services
- ▶ Non-financial providers in South Korea
- ▶ mPayments become popular

History

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In General

- ▶ Europe and Asia are ahead
- ▶ mBanking is restricted in relation to eBanking
- ▶ mBanking over SMS adds no crucial value
- ▶ Mobile penetration and user online experience must come together

History

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Aside the “Big Business”



History

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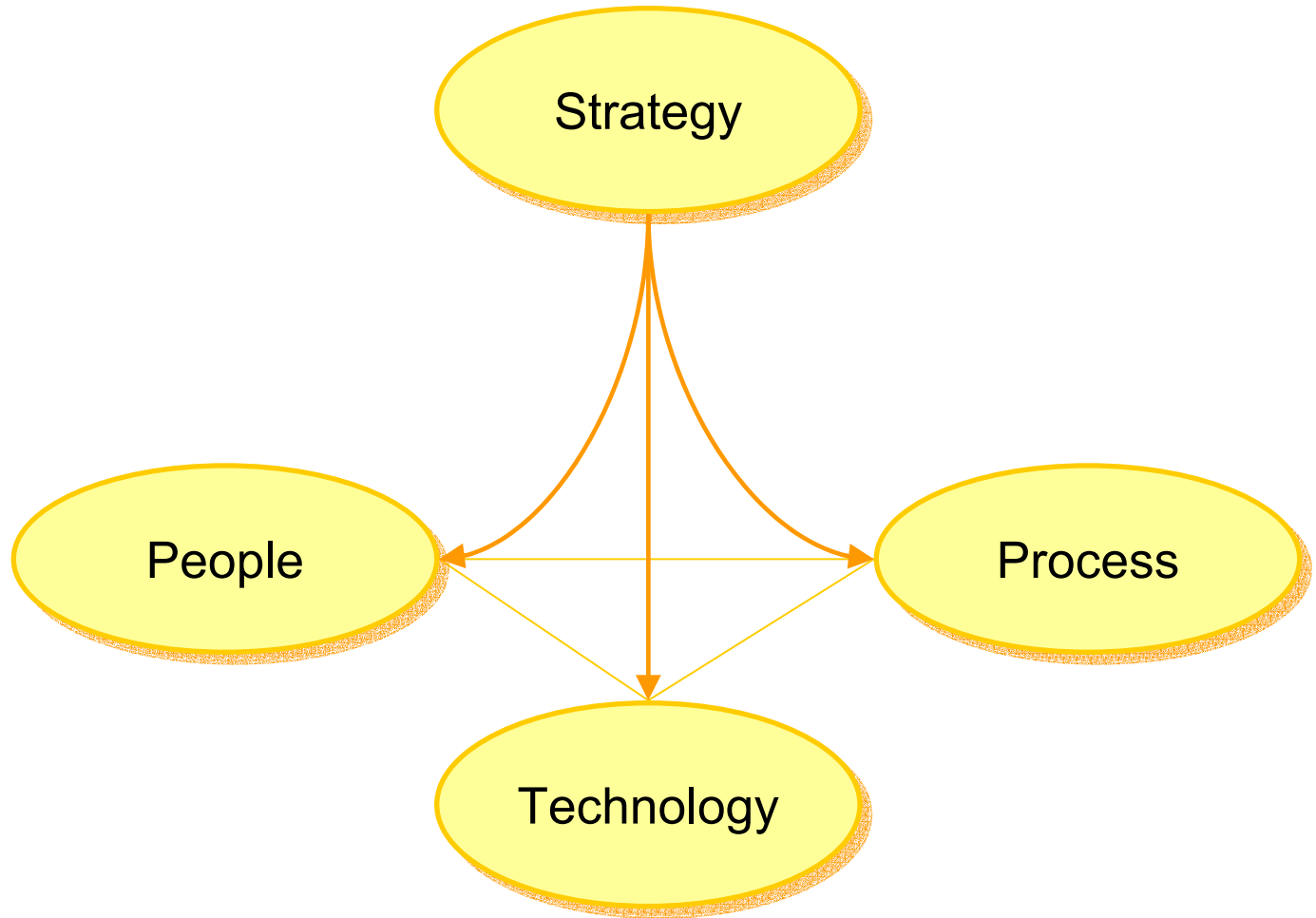
Conclusion

- ▶ New opportunities for customers and banks in undeveloped regions
 - Africa
 - parts of Asia



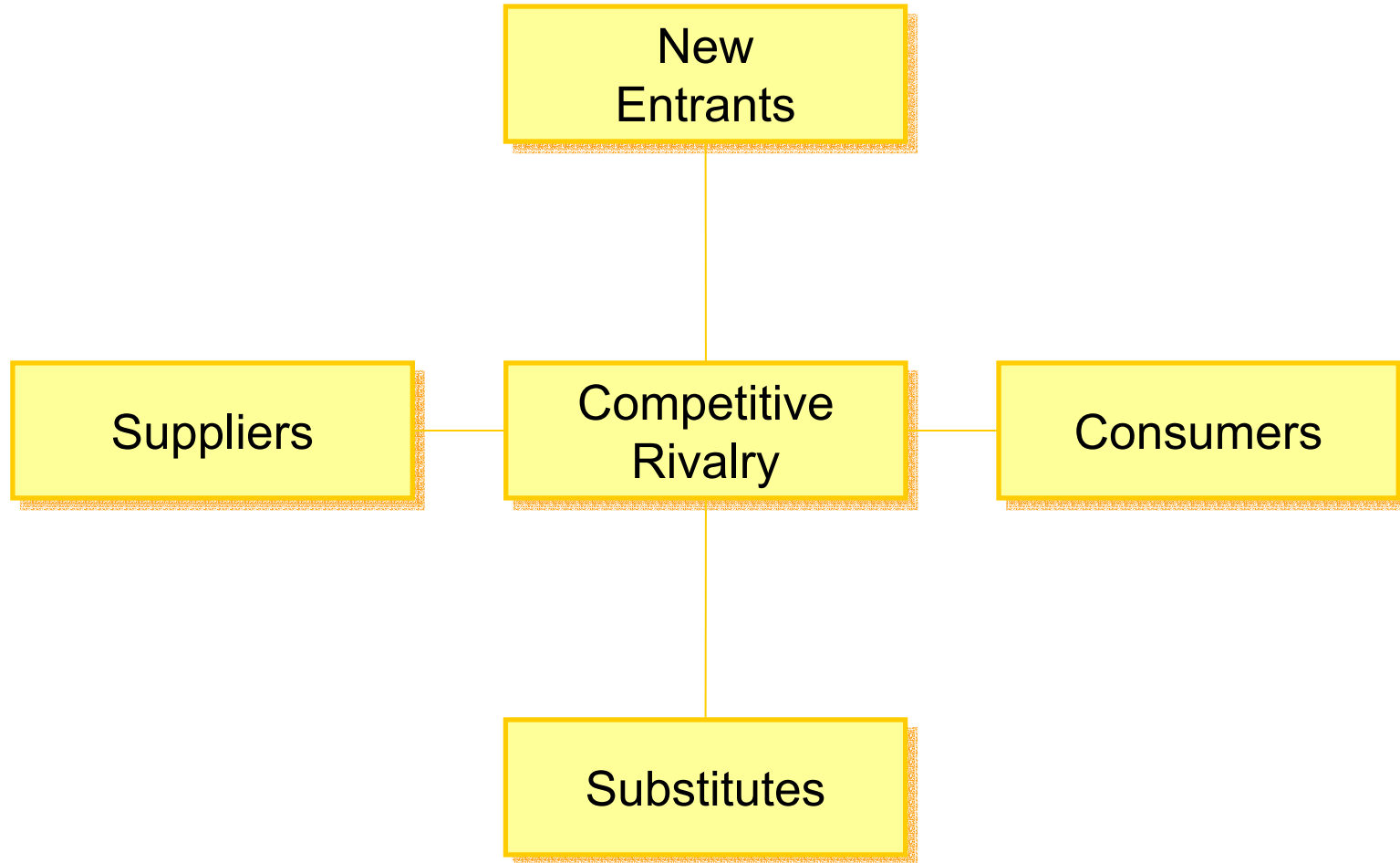
What Went Wrong?

- History
- Networks
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Porter's Model



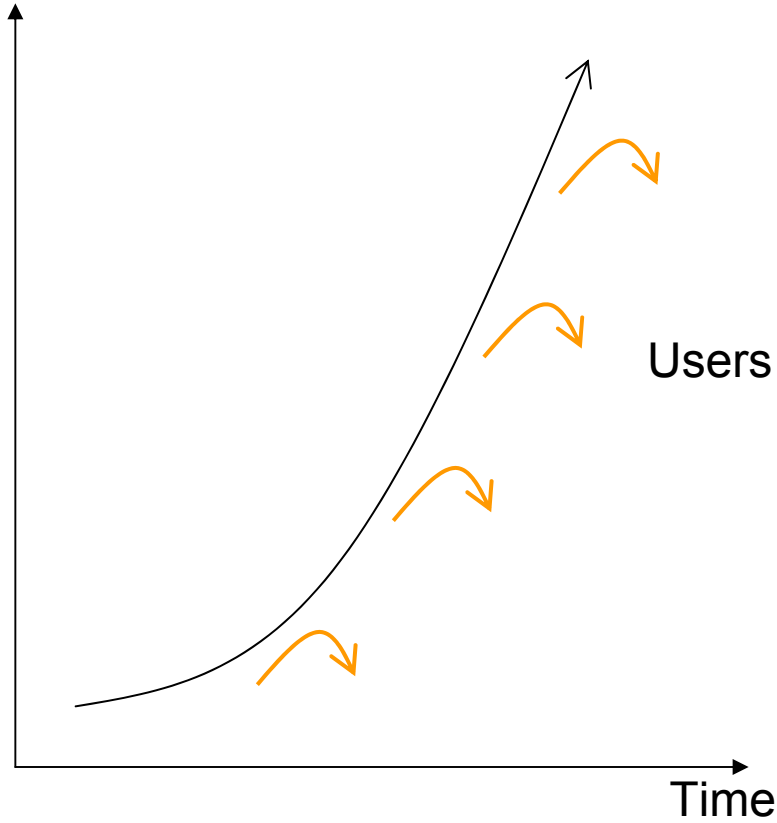
- History
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Change

- History
- Networks
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- Security
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Technology





Future of mBanking

History

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▶ Intelligent Alerts

- stock prices
- low bank balance
- bill payments
- cheques cashed

▶ Interaction

▶ Wait for 3G network and mature technology

Wireless Banking (M-Banking)



Questions ?

