Future Trends in the Mobile Telecommunications Industry

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Future Trends

- **Future of Mobile Multimedia**

  Mobile-centric or application-centric: A huge difference in value and a matter of standardisation

- **Fixed-to-Mobile Convergence and Substitution**

  Eldorado or a plunge into hell from a mobile operator's perspective?

- **VoIP on Mobile Phones**

  Not only a matter of price, but a matter of value added to the customer

- **Network Technologies**

  Short lifecycles mean substantial risk

Agenda

- Future of Mobile Multimedia
- Fixed-to-Mobile Convergence and Substitution
- VoIP on Mobile Phones
- Network Technologies

Mobile Multimedia: Development of Mobility

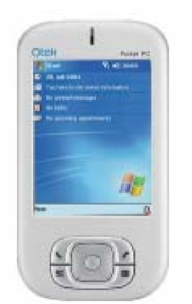
Time	1978	1986	1993	1998	2000	2002	2004	2006
Person to person	**talk**							
	text SMS	e-mail	MMS	IM				
TV / clips	live stream							
	time independent							
Music	**consume** portable radio, cassette recorder, CD-player, MP3-player							
	buy							
Pictures	**create** camera	digital	MMS					
	share							
Gaming	**play** Gameboy							
	multiplay							
Info/Reading	**read** newspaper, books							
	wap	mobile b'band						
Business	**work** paper	offline laptop	mobile email					
	mobile bb access							

- red: technically existent, mass market capability failed
- yellow: technically existent, mass market capability unproven
- green: technically existent, mass market capability proven

End Devices: The Game is Open

- **Mobile-centric**
  Convergence towards **“one device”** with mobile broadband access
  - Notebooks for business customers
  - Smart Phones for residential customers

- **Application-centric**
  Convergence towards **„multiple devices“**, each one equipped with a mobile broadband access



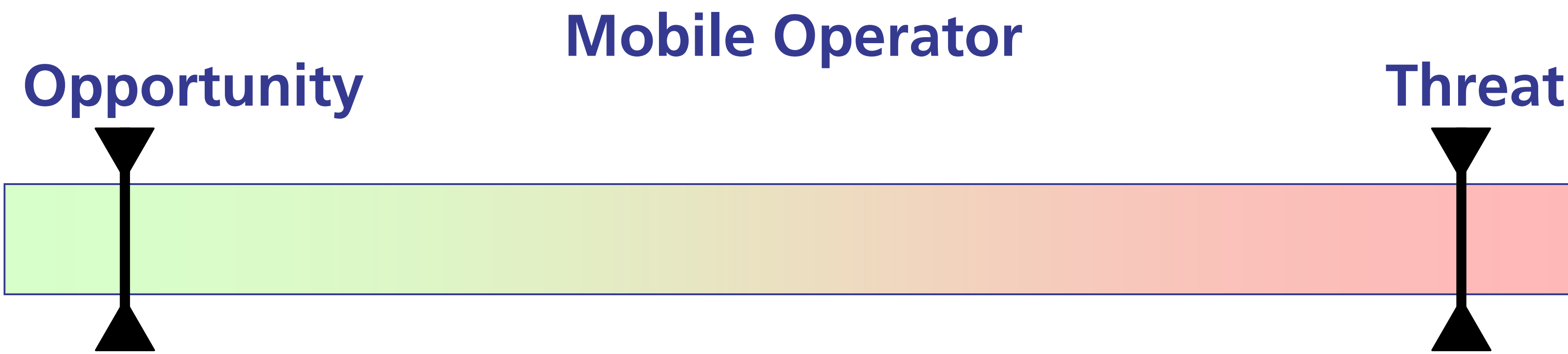
Fragmentation

Currently fragmented devices, operating systems and networks

- **End user devices**
  - Fragmentation of devices
  - Fragmentation of operating systems
  - Security issues / DRM
- **Mobile networks**
  - Fragmentation of access technologies due to physical limitations
  - „Seamless Access“ at highest available bandwidth preferred by end user
- **Applications**
  - Fragmentation on the application layer
  - „Walled Garden“ instead of „Open Garden“

High level of fragmentation prevents offering of scalable, performing multimedia services. For now, this leaves the predominance to application-centric devices.

Future of Mobile Multimedia
Conclusion



Huge opportunity, but need to overcome the limitations of a fragmented world first during short window of opportunity. If this problem is not solved in medium term, it might become huge threat.

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FMC / FMS Customer Needs

- Customer needs regarding Fixed-to-Mobile Convergence and Substitution are heterogeneous
  - Business vs. residential customers
  - Singles vs. families
  - Students vs. pensioners
- Thus, there will be different technical solutions for these different customer needs and the current technical debate (UMA, CTP, SIP, IMS etc) is being held in vain
- Regardless of the different segments, the most expected customer benefits are lower prices (one access fee, in-house mobile voice) and easy-to-use solutions

FMC / FMS for a Mobile Only Operator

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Impact on revenue streams for mobile operators

- Access ↗
- Voice ↘ - ↘↘↘ (dependant on fixed line/mobile premium)

- Data services successful, but data revenues not growing at expected rates
- Thus, some mobile operators see FMS offerings as a potential growth engine
- The long-term outcome of this strategy is unclear
  - Different scalability of mobile networks vs. fixed lines
  - Potential cannibalization of the 60% in-house revenues
  - Arguments for a mobility price premium might be challenged
  - Need of some form of fixed line broadband bundling
  - UMTS / HSDPA are ill alternatives for DSL

FMC / FMS for a Fixed Line Only Operator

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Impact on revenue streams for fixed line operators

- Narrowband Access → (instead of declining without FMC)
- Voice ↗
- Broadband Access →
- Broadband Services →

- As broadband penetration increases, broadband applications such as VoIP will reach critical mass
- Thus, the revenue flow for a fixed line operator will move towards broadband revenues with mainly flat fee pricing

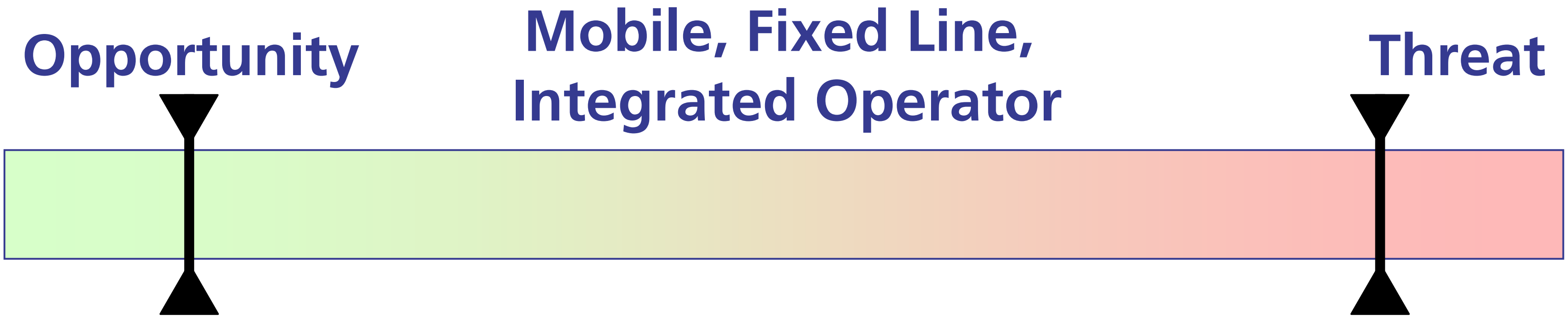
FMC / FMS for an Integrated Operator

Impact on revenue streams for fixed line operators

- Narrowband Access ↘↘
- Voice (PSTN & Mobile) ↘-↘↘↘

- For an integrated operator, FMC is a defensive move against attacks from
  - existing players from the fixed or mobile only world
  - new entrants like VoIP players

FMC / FMS
Conclusion



FMC / FMS can be everything between a huge opportunity or a huge threat. It depends mainly on

- whether a telco is a stand alone operator or an integrated player
- the fixed line/mobile premium
- the regulatory situation

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VoIP on Mobile Phones

WLAN enabled handsets foster VoIP on mobile phones

NEC N900iL
First UMTS/WLAN Handset for Japanese market

Qtek 9090
GSM/WLAN Pocket PC

The quality of service becomes easier to guarantee with the new WLAN standard 802.11e, which is critical for delay-sensitive applications such as Voice over Wireless IP. The new technologies will drive down tariffs for on-campus mobile telephony towards those of fixed line telephony over IP.

VoIP on Mobile Phones

Evolution from price-centric to service-centric focus

- Mobile operators could technically prevent VoIP on mobile phones in areas with only GSM/UMTS coverage

- However, the 60% revenues coming from in-house mobile phone calls are at risk, as soon as other access technologies like WLAN are available

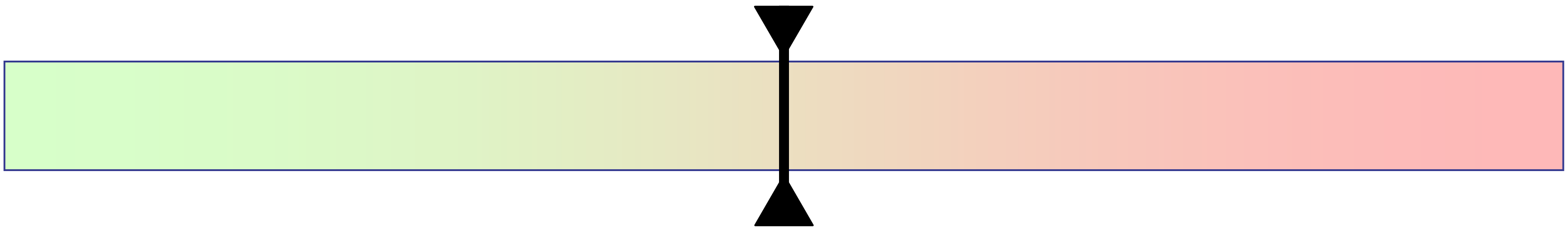
- Today, VoIP drives down tariffs in the fixed line world. Tomorrow, focus will shift to new services such as presence management which will increase productivity

- In the medium to long term, customers will demand these new services for the mobile world as well, accelerating the introduction of mobile VoIP

VoIP on Mobile Phones
Conclusion

Mobile Operator

Opportunity **Threat**



VoIP on mobile phones makes sense from a customer perspective. The winning strategy for a mobile operator is to satisfy future customer needs instead suppressing the technology.

The impact on value is driven by the difficult decision between the risk of doing it early (cannibalisation) vs. doing it late (loss of market share).

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Network Technologies

Mobile bandwidth to increase while prices will come under pressure

- Market research reveals that mobile phone coverage is the main driver of customer satisfaction
  - main differentiator for a mobile operator
  - main justification of a price premium

- Evidence from fixed line operators shows that broadband bandwidth
  - justifies a higher price as long as there is a demand for more bandwidth
  - but then becomes a commodity which is simply expected to increase steadily with unchanged prices

$\Rightarrow$ **same development as in fixed line business**

Network Technologies

Limited bandwidth upgrade potential of mobile networks

- Lifecycle of mobile network technologies
  - long for voice services (10-20 years)
  - short for data services (5-10 years)

- Short lifecycle of mobile networks for data services because
  - customers expect bandwidth to increase in line with fixed line
  - but potential to increase performance limited
    - factor 1000x for a given fixed line network technology (copper, fibre)
    - factor 5-10x for a given mobile network technology (2G / 3G)

⇒ **different development than in fixed line business**

Network Technologies

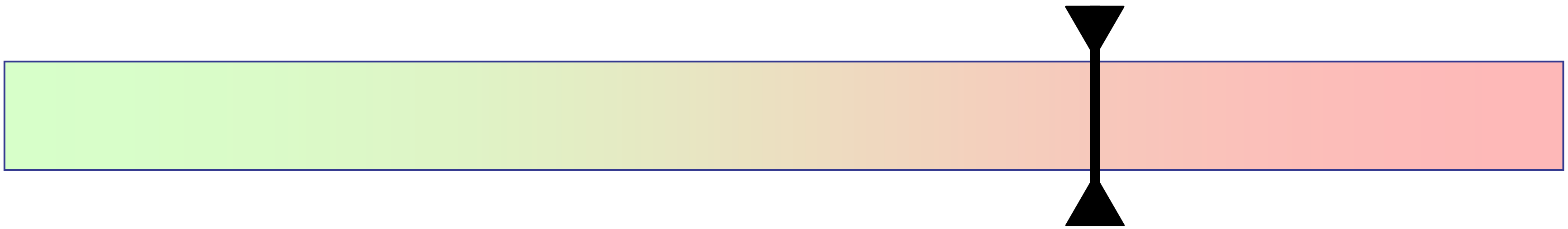
Technological risk

- The short lifecycle of mobile networks creates opportunities for attackers using new network technologies
- This evolution is mainly driven by regulation of available frequencies and bandwidth

Network Technologies
Conclusion

Mobile Operator

Opportunity **Threat**



Short lifecycles of data centric mobile network technologies create investment risks for mobile operators.

Summary

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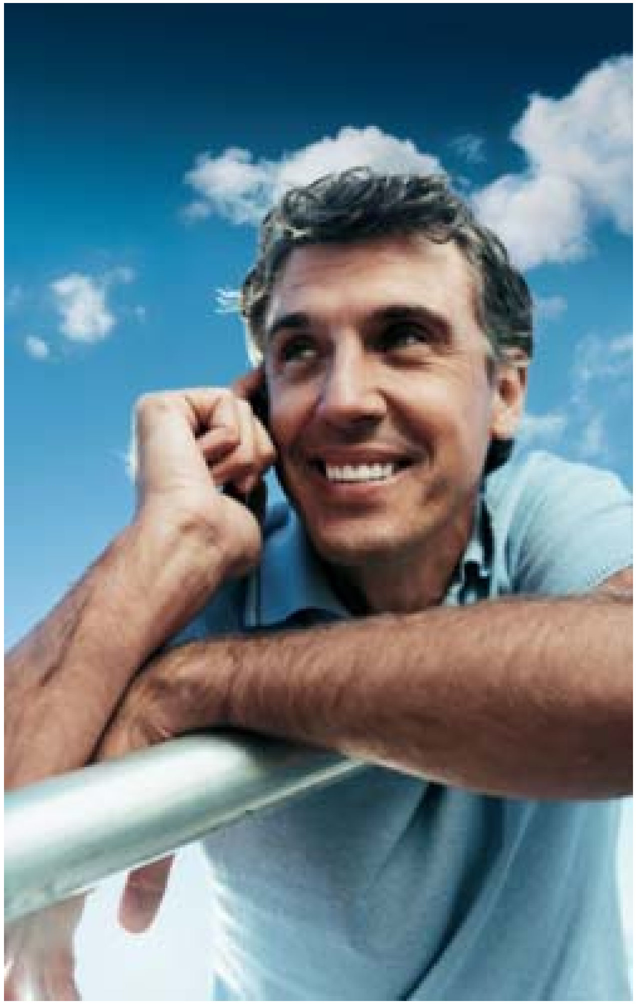
Q & A

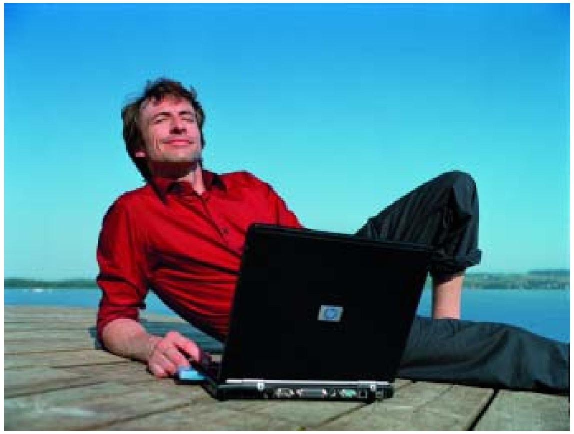


Annex

Swisscom Mobile: Proven Track Record as Innovation Leader

Award-winning „Mobile Unlimited“

- Mobile broadband access
- 3in1 PC Card (WLAN, UMTS and GPRS)
- Seamless handover between technologies
- SIM-based authentication



Next steps

- 3in1 PC Card (WLAN, EDGE und GPRS)
- 4in1 PC Card (WLAN, UMTS, EDGE und GPRS)
- Integration of private networks (C-WLAN) into seamless handover of Mobile Unlimited