Techno-Economic aspects of FMC opportunities based on the MUSE project

Mario Kind
T-Systems Enterprise Services GmbH

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Agenda

> Introduction
> Methodology
> Framework assumptions
> Results
What is FMC from MUSE perspective?

- Interesting and challenging topic with different flavours…
- Fixed network operator point of view: exclude any mobile related things like network, revenues…
- Use cases developed in technical and business work packages
  ➔ Alignment necessary
- Architecture developed supporting nomadism and session continuity
- Analysis of business model impact
- Delta analysis: compare with the best case of the basic architecture (Ethernet based access/aggregation network)
MUSE FMC definitions

- Nomadism
- Session Continuity
- Continuous Mobility
- Handover
- Seamless Handover

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Methodology overview

Customer base and demand updates

Modelling of FMC network components

Modelling of "Willingness to Pay" based FMC revenue model

Demand for the Telecommunication Services

TONIC Tool-environment

Services

DB

Architectures

Geometric Model

Revenues

OAM Costs

Investments

Economic Inputs

Cash flows, profit & loss accounts

First Installed Costs - CAPEX

Year 0

Year 1

Year 2

Year n .. Year m

NPV

IRR

Payback Period

Calculation of FMC business case

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1. Identify the potential number of subscribers in person-oriented mobile networks and household-oriented fixed networks

Penetration with both fixed broadband and mobile

Year

Households
Business

Penetration in %

Source: Details in MUSE DA3.3
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2. Identify the size of the different types of broadband mobile network connections

![Broadband mobile market graph](image)

Source: Details in MUSE DA3.3
3. Estimate the number of wireless or nomadic enabled user devices

![Nomadic enabled devices chart]

Source: Details in MUSE DA3.3

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Input: FMC subscriber

User with a subscription to nomadic or session continuity services that allow him to get connectivity from another location outside his home network/business premises or to transfer a mobile connection to his fixed home network/business premises.

Source: Details in MUSE DA3.3
Revenue model based on Willingness to Pay (WtP)

- SP Characterization
- Target Customers Identification
- Users Segmentation
- WtP estimates
- Identification of necessary SP
- Characterization for all SP
- Definition of parameters values
- Consistency Check
- What-if analysis
### Service packages

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<tr>
<th>Fixed access</th>
<th>Nomadic access</th>
<th>Portable Simple Mobility</th>
<th>Full Mobility</th>
<th>Multimode Single Terminal</th>
<th>Multi Terminal</th>
<th>Bandwidth on Demand</th>
<th>Public Private Hotspot</th>
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- **Service Package "Nomadic Internet"**
- **Service Package "Video & TV everywhere"**
- **Service Package "Full Person 2 Person communication"**
- **Service Package "Wireless Internet Cafe"**

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**T • Systems**
- Updated Residential Gateway (RGW) that can separately handle the home user and a visitor.
- Software upgrade of the access node to enable the new functionality in the RGW
- Packet Data Network Gateway (PDN-GW) needs to be added in the service edge node as an additional blade

Source: Technical details in MUSE DTF1.8
Result: Subscribers + service packages = traffic
OPEX model
Result: Delta investment and revenue analysis

Delta investment and revenue analysis

- **Cumulated OA costs**
- **Cumulated Investment FMC**
- **Cumulated Investment Network**
- **Cumulated Investment Link Level**
- **Cumulated Total Costs**
- **Cumulated Revenues**
- **Cumulated Total Investments**

Year:
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

Cumulated OA costs:
- 2006: 0.0 Mi€
- 2007: 0.5 Mi€
- 2008: 1.0 Mi€
- 2009: 1.5 Mi€
- 2010: 2.0 Mi€
- 2011: 2.5 Mi€
- 2012: 3.0 Mi€

Cumulated Investment FMC:
- 2006: 0.0 Mi€
- 2007: 0.5 Mi€
- 2008: 1.0 Mi€
- 2009: 1.5 Mi€
- 2010: 2.0 Mi€
- 2011: 2.5 Mi€
- 2012: 3.0 Mi€

Cumulated Investment Network:
- 2006: 0.0 Mi€
- 2007: 0.5 Mi€
- 2008: 1.0 Mi€
- 2009: 1.5 Mi€
- 2010: 2.0 Mi€
- 2011: 2.5 Mi€
- 2012: 3.0 Mi€

Cumulated Investment Link Level:
- 2006: 0.0 Mi€
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- 2007: 0.5 Mi€
- 2008: 1.0 Mi€
- 2009: 1.5 Mi€
- 2010: 2.0 Mi€
- 2011: 2.5 Mi€
- 2012: 3.0 Mi€

Cumulated Revenues:
- 2006: 0.0 Mi€
- 2007: 0.5 Mi€
- 2008: 1.0 Mi€
- 2009: 1.5 Mi€
- 2010: 2.0 Mi€
- 2011: 2.5 Mi€
- 2012: 3.0 Mi€

Cumulated Total Investments:
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Result: Delta revenue business case analysis

Delta FMC Business Case analysis 2006-2012
(FMC case compared to Base scenario)

Delta in k€: -1000, -900, -800, -700, -600, -500, -400, -300, -200, -100, 0

- Discounted Cash Balance
- NPV
Results

> Tonic tool for techno-economic analysis has been updated with a revenue model and with a model for additional cost for networks that can handle nomadism and session continuity.

> FMC service penetration increase from 1.5 % in 2007 to 23 % in 2012. Total amount of nomadic traffic in the networks is estimated to only 8% the year 2012.

> CAPEX are higher in the beginning resulting from upgrades in AN and PDN. In general investments into new RGWs are dominating.

> The OPEX dominating the cost side with major impacts by failure diagnosis and related help line calls.

> The overall business case is slightly negative at the end of the study period with a strong positive performance in the end.
Thank you for your attention. Questions?

Details:
- D A3.2p MUSE - Techno-economics for fixed access network evolution scenarios
- DA3.3 Economical guidelines and decisions in BB access (results of use cases)

Team
- Thomas Monath, Sandro Krauß, Mario Kind (Deutsche Telekom), Kare Gustafsson (Ericsson), Clara Zanni (Telekom Italia), Peter Vetter, Chris Hawinkel (Alcatel-Lucent)