

Analyzing OSS/BSS Software

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Business Process, Network Technology and SW Markets

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Pasi Tyrväinen

Pasi.Tyrvainen@jyu.fi,
<http://users.jyu.fi/~pttyrvai/>

Vertical software market evolution & OSS/BSS

- Levels of observation of a software market
 - Total SW market
 - **Vertical SW market**
 - Market segment
 - SW product + sw service
- Telecom service provider SW market
 - Process view
 - Market view
 - Technology view

Vertical SW

Process
requirements

Environment
Ability to implement

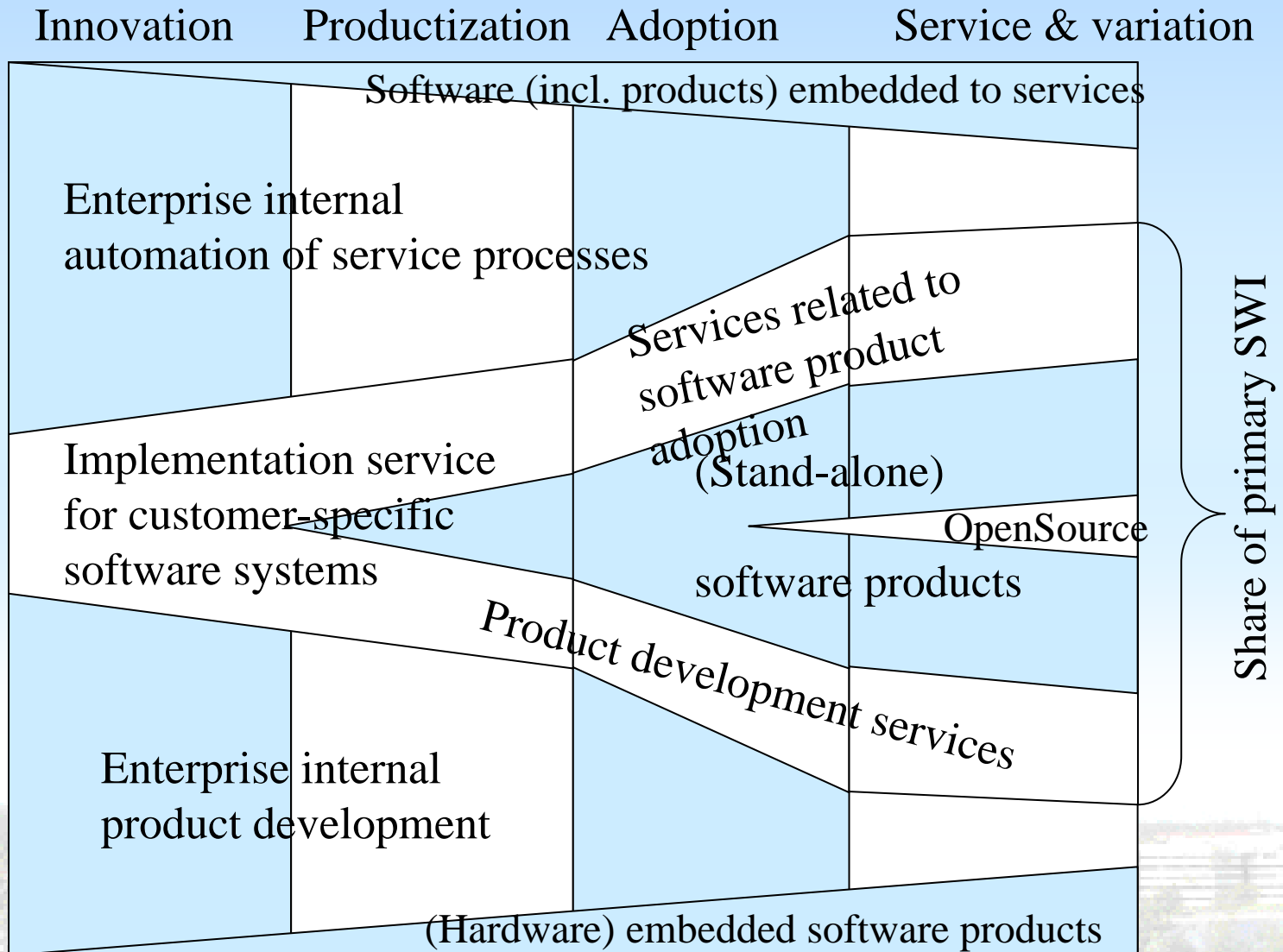
Level of
- automation
- productization
- complezity
of the **process
implemented
with software**

Software
interfaces used



Hardware
interfaces used

Vertical SW Industry Evolution

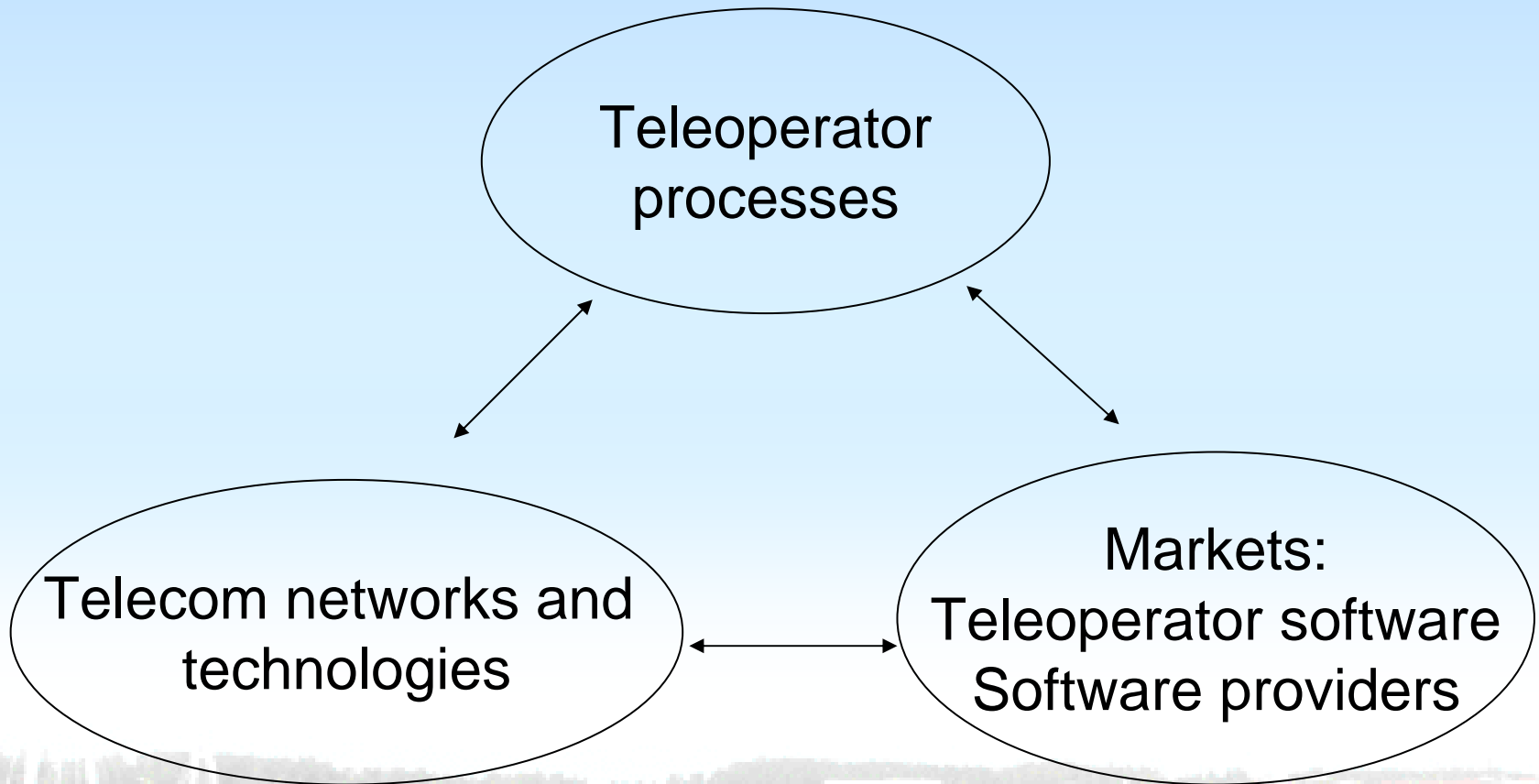


Drivers and Features	Innovation Phase	Productization Phase	Transition Phase	Service and Variation Phase
Process drivers (Vertical industry)	Process innovation, Competitive advantage (differentiation / costs), Enterprise-specific processes	SW supported processes, Process harmonization, Repeatability between enterprises	Process standards adopted	Process optimization, IT process cost optimization
Software Business	Customer-specific services, Integrated HW/SW products, An application per enterprise	Productization, Competing standards, Micro ecologies, Network development	Market share race, Competing ecologies	New development on the dominant SW platform, Open Source
Technology Drivers	Technology innovation, Competing with IPRs and closed interfaces, Equipment vendors dominating SW market	Technology standardization within vertical market segment, Multiple strong vendors	Fast technology adoption, Market expansion	Technology dominance, Bulk hardware with standard interface and large user base

SmarTop Project

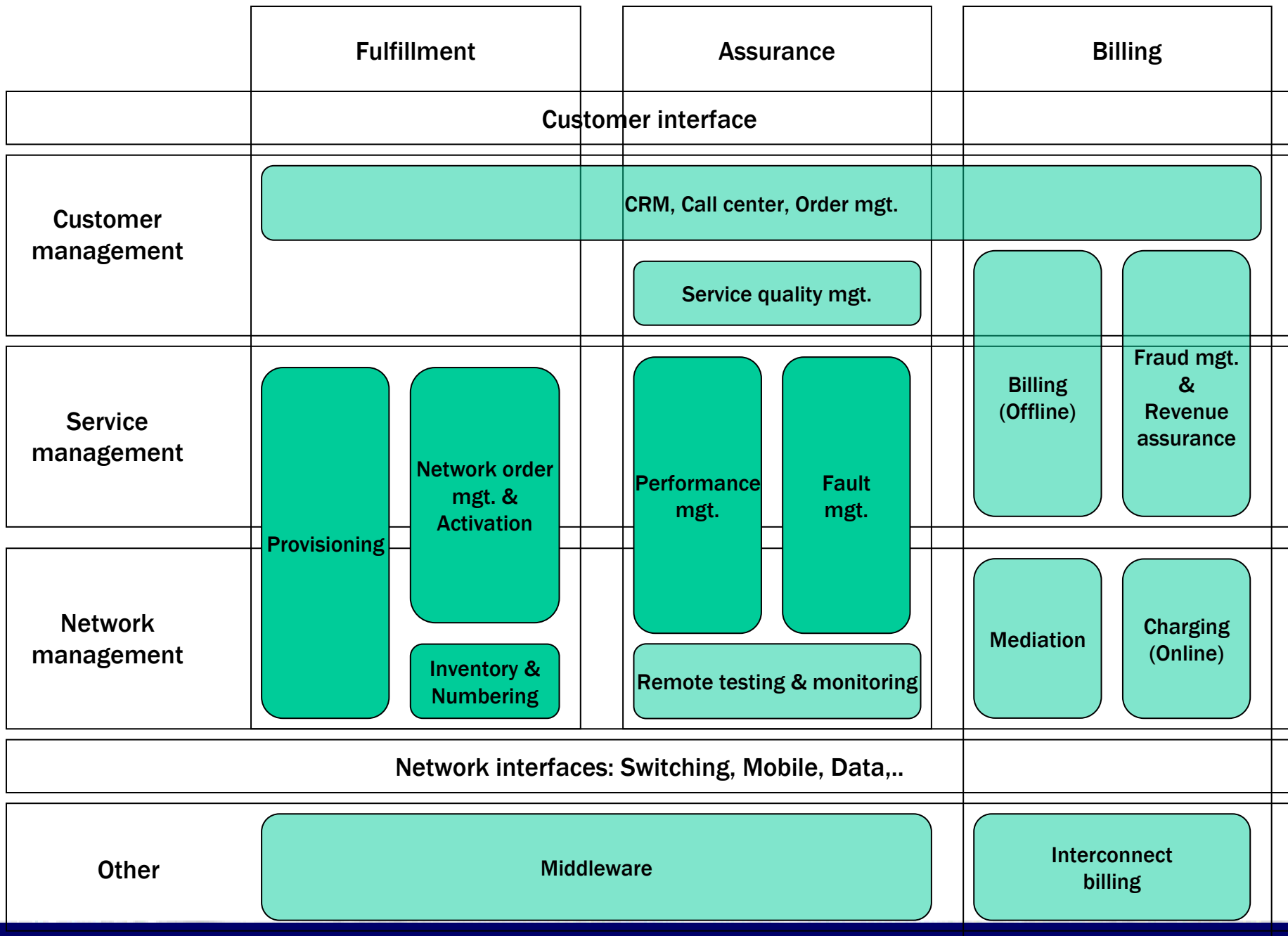
- Analyzing vertical software market of telecom operator software (OSS/BSS)
- 1.1.2007 – 31.12.2008
- Tekes research project, funded 80%
- Business Partners:
 - Nokia Siemens Networks, Tecnomen (project board members)
 - Comptel, Finnet group / MPY, Nethawk
- Faculty of Information Technology, Univ. of Jyväskylä
 - Dr. Lauri Frank, Mirja Pulkkinen, Dr. Oleksiy Machelis, Eetu Luoma
- Resarch Partners
 - Etna: Prof. Olli Martikainen, UoJ: Prof. Jari Veijalainen
 - Lappeenranta Univ. of Technology: Sirmakka / Kimmo Suojapelto
 - Prof. Jeffrey Funk, National University of Singapore
 - Prof. Rich Kazman & Hong-May Chen, University of Hawaii

Different Approaches

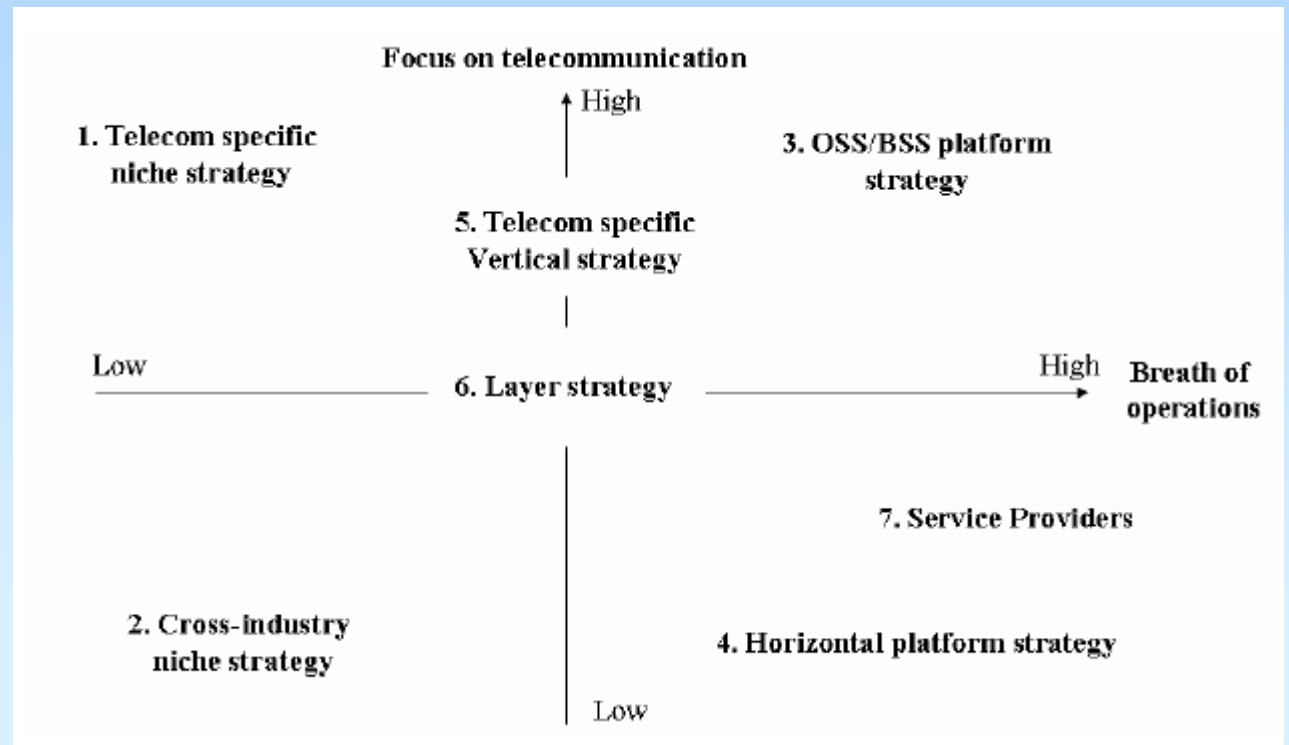


eTOM - Enhanced Telecom Operations Map



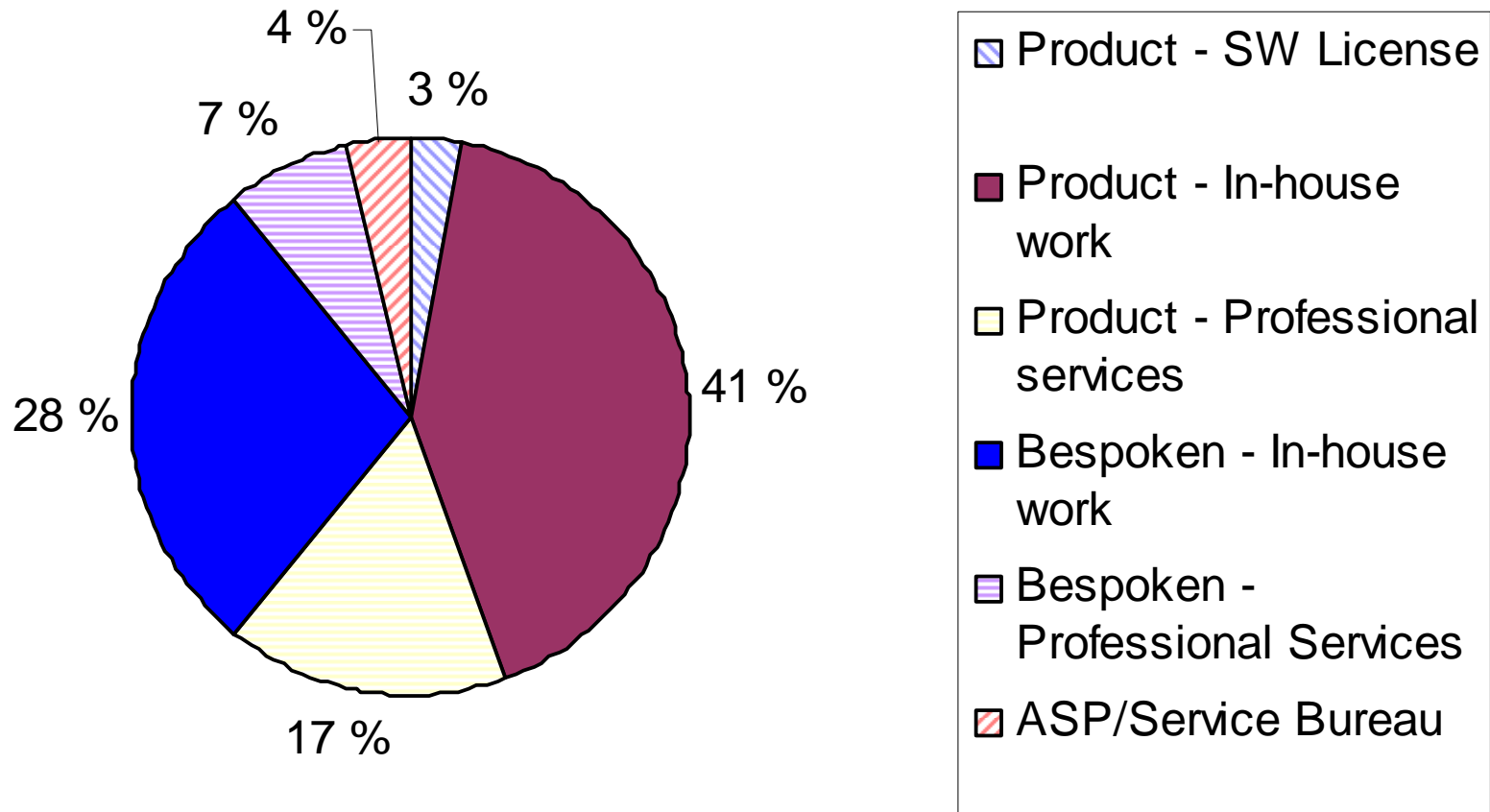


OSS/BSS Software Market



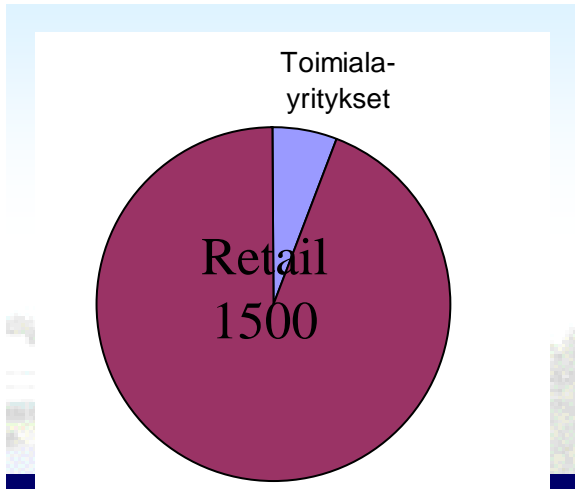
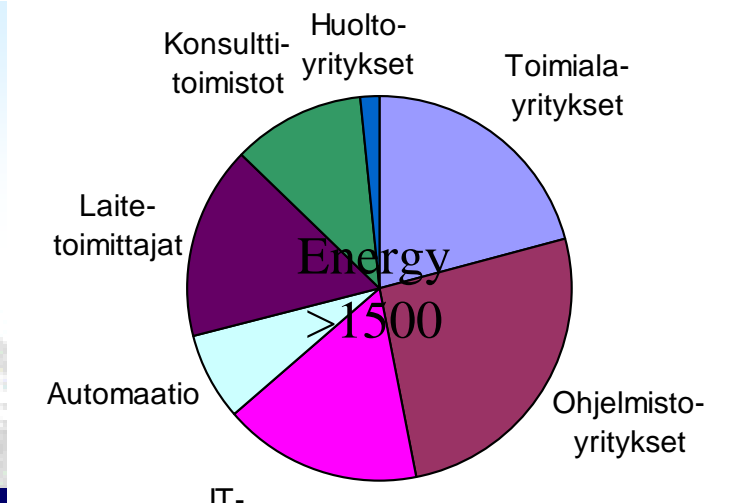
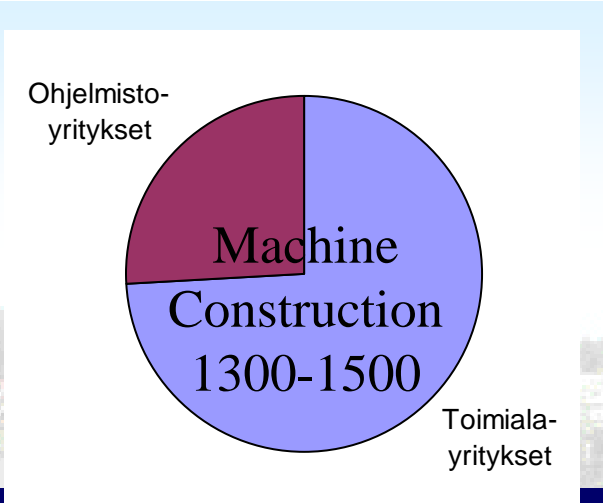
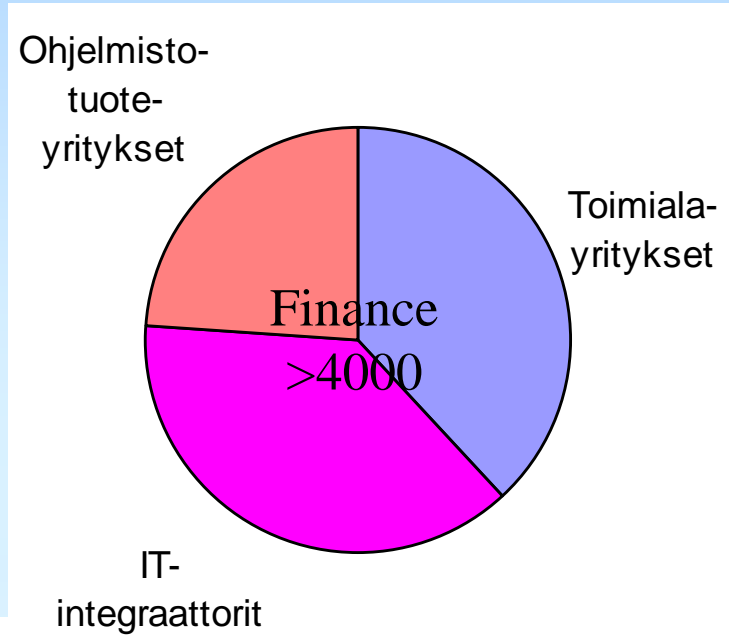
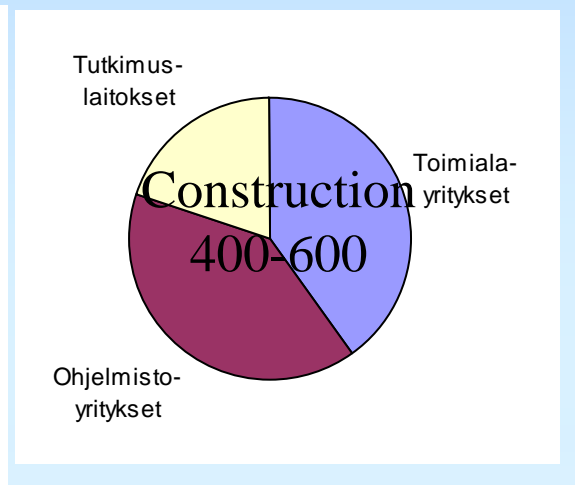
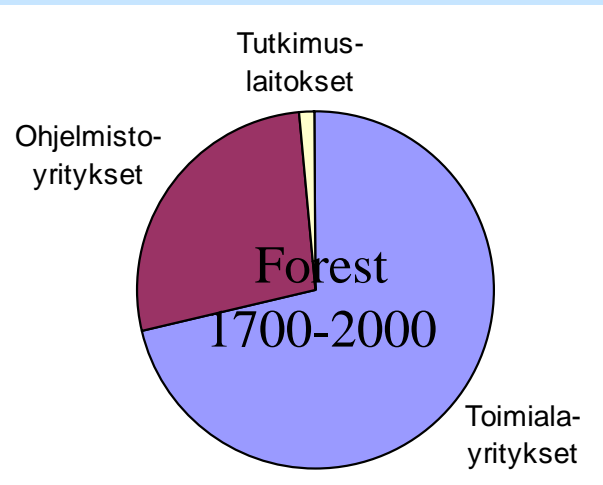
Strategy	# of companies	Average OSS Revenue
1. Telecom specific niche strategy	40	M\$ 826,0
2. Cross-industry niche strategy	8	M\$ 143,0
3. OSS/BSS platform strategy	26	M\$ 5347,2
4. Horizontal platform strategy	5	M\$ 1064,0
5. Telecom specific vertical strategy	39	M\$ 2778,6
6. Telecom specific layer strategy	8	M\$ 842,0
7. Service provider	61	M\$ 11801,0
Total	187	M\$ 593,9

OSS/BSS SW Spending (= SW Market + CSP In-House Costs)

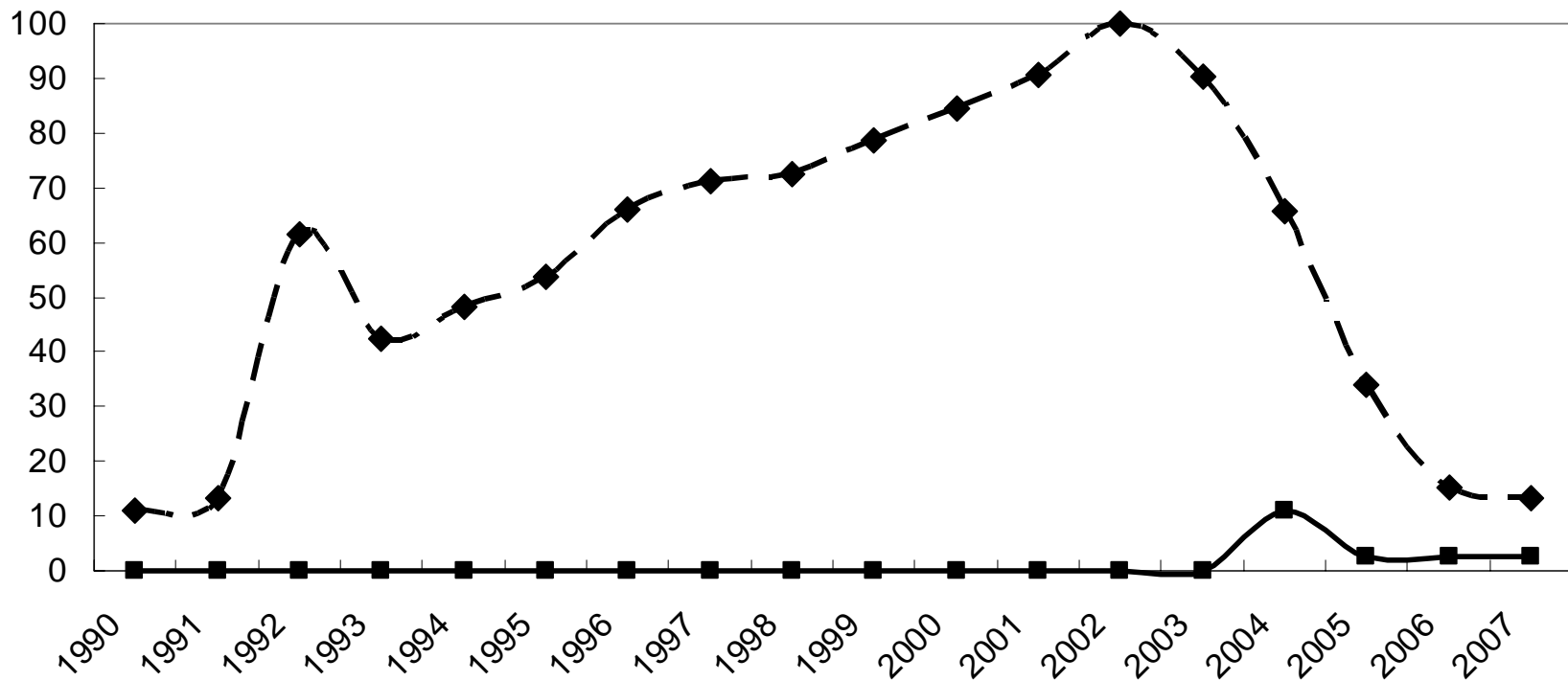


(Based on Dittberner 2005 database)

Software Developers in Six Industries



Standardization and SW Development Effort

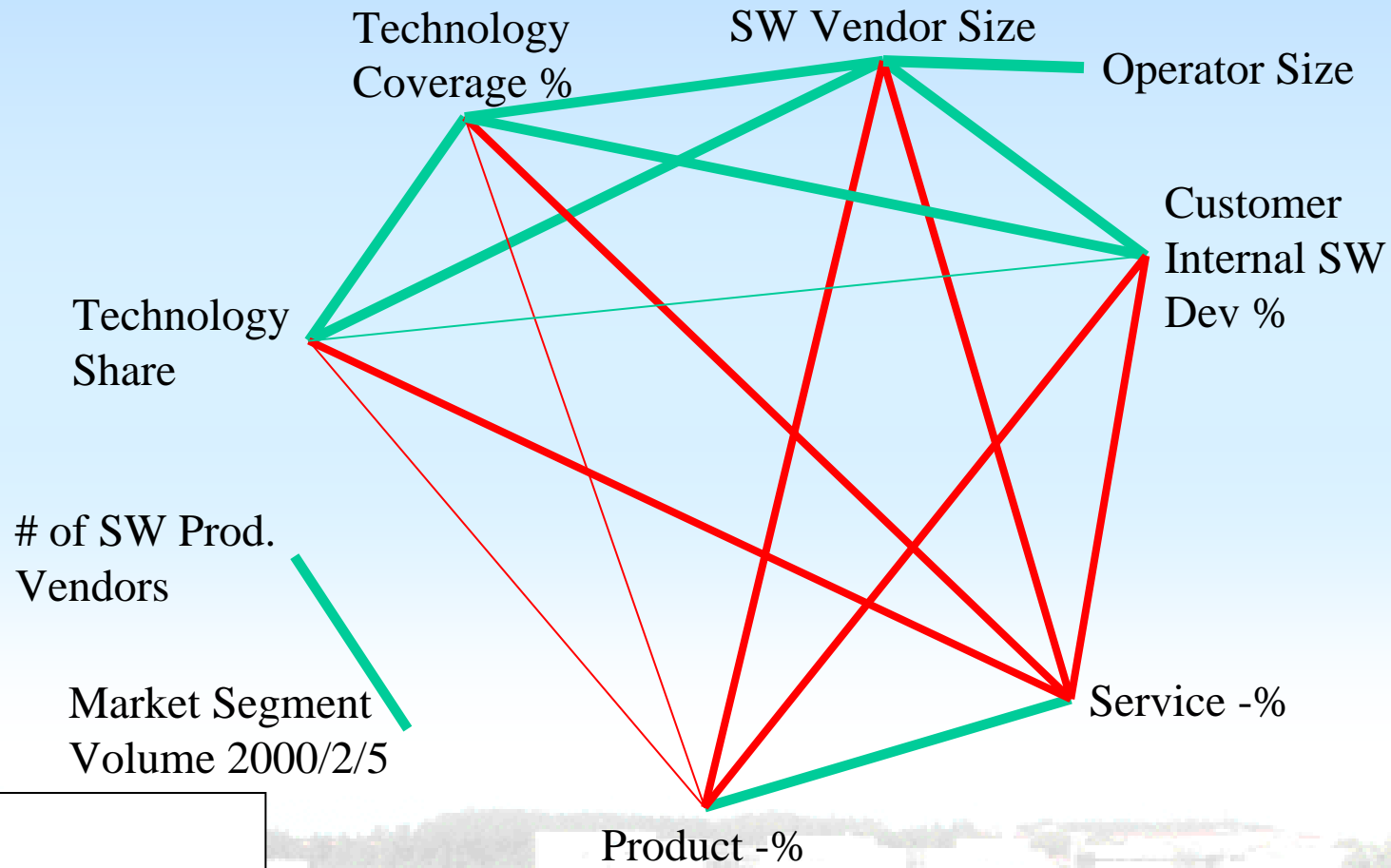


Efforts devoted to interface implementation by a mediation software company.

Upper line: all types of interfaces are supported.

Lower line: only interfaces following IETF standards are supported

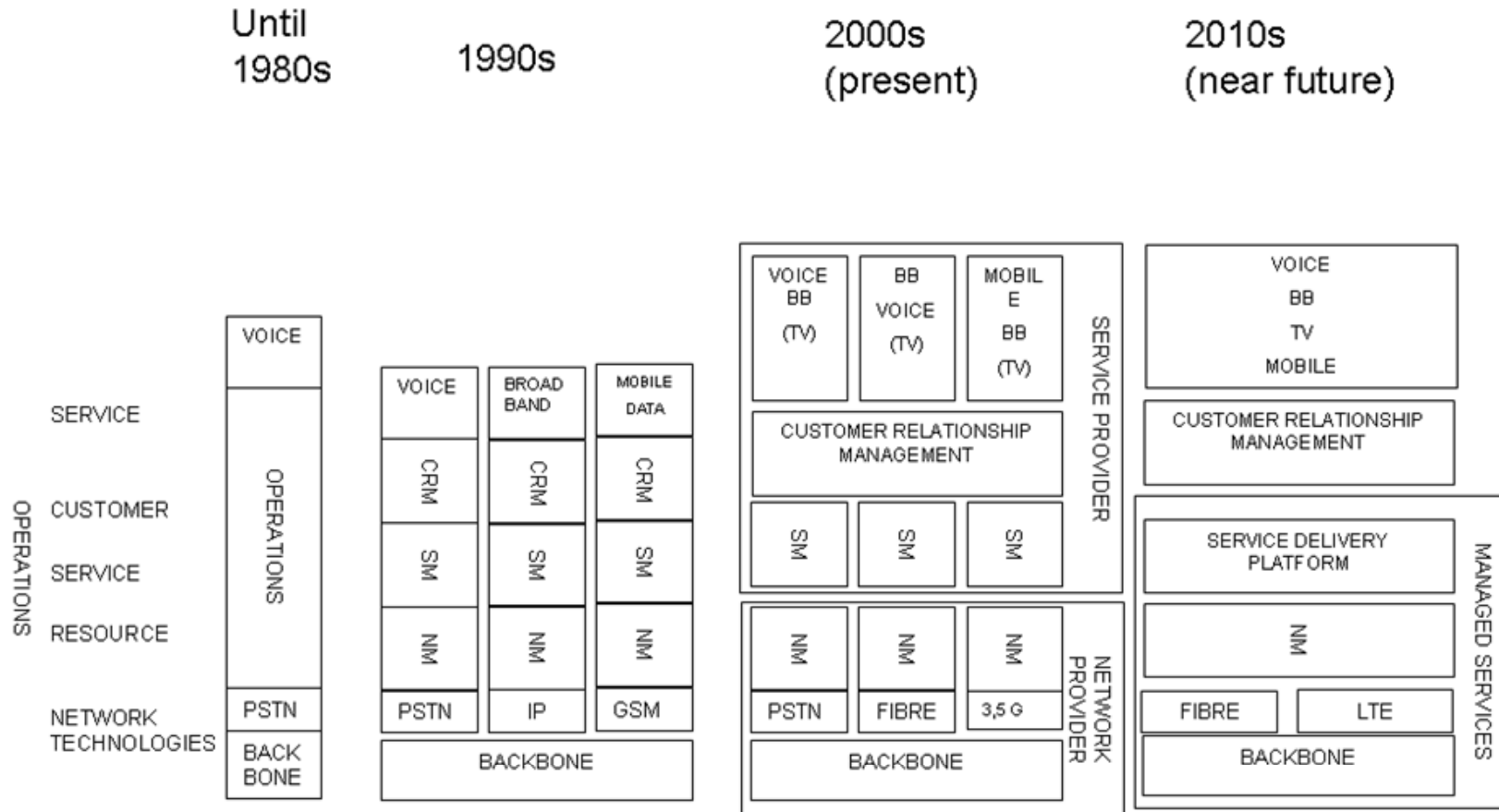
OSS/BSS Market Segments



*	**	
		Positive correlation
		Negative correlation

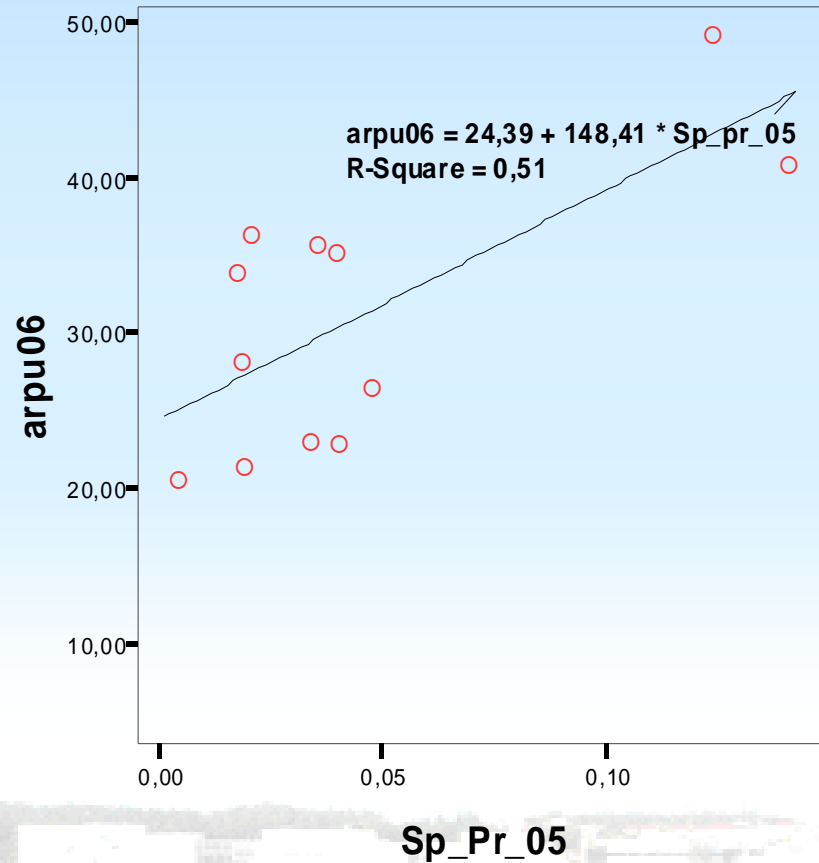
(Based on Dittberner 2002-6 databases)

Evolution of a teleoperator's structure



ARPU

- Linear regression (stepwise)
- ARPU depends on SW spending
 - Variable «SW spending percentage 2005» explains 51% of variance
 - Positive coefficient (0.71)
 - ! Only 12 cases
- Possible explanations:
 - Use of SW increases ARPU
 - Wages in a country affect ARPU: ARPU–GDPPP correlation (Spearman) 0,814**
- Doesn't correlate with other



Further Research

- Delphi analysis
 - Experts are welcome to judge mini scenarios on OSS/BSS market development.
- OSS/BSS Mergers and acquisitions
- Impact of software to CPS KPIs
 - Internal SW, Licenses, Tailoring, CAPEX, OPEX
 - ARPU, Net profit %, ...
- Project SEC 2009
 - Analysis of SaaS to CSP business (NSN, Comptel, Qvantel..)
- FW 7 proposal preparation (March 03 call for 2010-)
 - Partners and proposals are welcome!

SmarTop Publications

- Pasi Tyrväinen, Juhani Warsta, and Veikko Seppänen, *Evolution of Secondary Software Businesses: Understanding Industry Dynamics*, in Proc. of the IFIP WG 8.6, Madrid, Spain, 22-24 October, 2008, Vol, pp. 11-3.
- Pasi Tyrväinen and Lauri Frank, *Diffusion of telecom software services and products – from legacy services to focused products*, in Proc. of Telecommunications, Networks and Systems (TNS 2008) Amsterdam, Netherlands, 22-24 July, 2008.
- Oleksiy Mazhelis, Pasi Tyrväinen, and Jarmo Matilainen, *Analyzing Impact of Interface Implementation Efforts on the Structure of a Software Market: OSS/BSS Market Polarization Scenario*, in Proc. of ICSOFT 2008, Porto, Portugal, 5-8 July, 2008.
- Lauri Frank and Eetu Luoma, *Telecommunications Software Industry Evolution*, in Proc. of 7th Conference on Telecom, internet & media Techno-Economics (CTTE 2008), Paris, France, 2008.
- Lauri Frank, Eetu Luoma, and Pasi Tyrväinen, *Market Scope of Vendors in the OSS Software Market*, in Proc. of the IEEE International Conference on Industrial Engineering and Engineering Management (IEEM 2007), Singapore, December 2-5, 2007, pp. 2096-2100.
- Oleksiy Mazhelis, Pasi Tyrväinen, and Erkki Viitala, *Modeling Software Integration Scenarios for Telecommunications Operations Software Vendors*, in Proc. of IEEM 2007, pp. 49-54.
- Oleksiy Mazhelis and Pasi Tyrväinen, *Modeling Telecommunications Software Horizontalization using Systems Interconnectivity Matrix*, in Mika Hannula, et.al. (Eds.), Proc. of EBRF 2007, Jyväskylä, Finland, 2007.
- Pasi Tyrväinen, Eetu Luoma, and Lauri Frank, *Business Strategies of Telecommunications Software Vendors*, in Mika Hannula, et.al. (Eds.), (EBRF 2007), Jyväskylä, Finland, 2007.
- Olli Martikainen, *Productivity Improvements Enabled by ICT based Process Transformations*, in Proc. of BCI'2007, Sofia 27-29.9.2007, pp. 1-8.
- Olli Martikainen, *Business Process Productivity Improvements Enabled by Broadband and Mobile Telecom Services*, in Proc. of the 46th Congress FITCE, Warsaw, 30.8.-1.9.2007, pp. 1-6.

Thank You!