

Software Quality Management - Quo Vadis?

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- Introduction
- Software and its environments
- Software in large enterprises
- Opportunities for research
- Q&A

Credit Suisse Group today – key facts

- **Global bank** headquartered in Zurich, serving clients in private banking, investment banking and asset management.
- **Registered shares** of Credit Suisse Group AG (CSGN) are listed in Switzerland (SIX) and as American Depositary Shares (CS) in New York (NYSE).
- Total number of **employees**: 50,100.
- The Group's **long-term ratings** are: Moody's Aa2, Standard & Poor's A, Fitch Ratings AA-.



IT Division Facts & Figures (July 2010)

Financials / Human Capital Portfolio

- IT budget is CHF ~3 billion, whereof
 - ~55 % Run-the-Bank (RtB)
 - ~45 % Change-the-Bank (CtB)
- IT headcount is ~14'000, whereof
 - ~9'500 permanent FTE
 - ~4'500 contractor FTE
 - plus additional 3'500 out-sourced services FTE
- One central IT Division with people in 64 different legal entities globally

Other key figures

- 67'500 supported users in 550 locations
- 4 main hub Production-DR* pairs of data centers consuming 14 MW** of power (~25'000 US homes)
- Hardware
 - 93'500 workstations / laptops
 - 26'000 physical servers with more than 18'000 Terabyte storage
 - 10 host / mainframe CPUs with 61'700 MIPS*** provided,
- Software
 - 6'700 applications

* DR = Disaster Recovery, ** MW = Mega Watt, *** MIPS = Million Instructions per Second

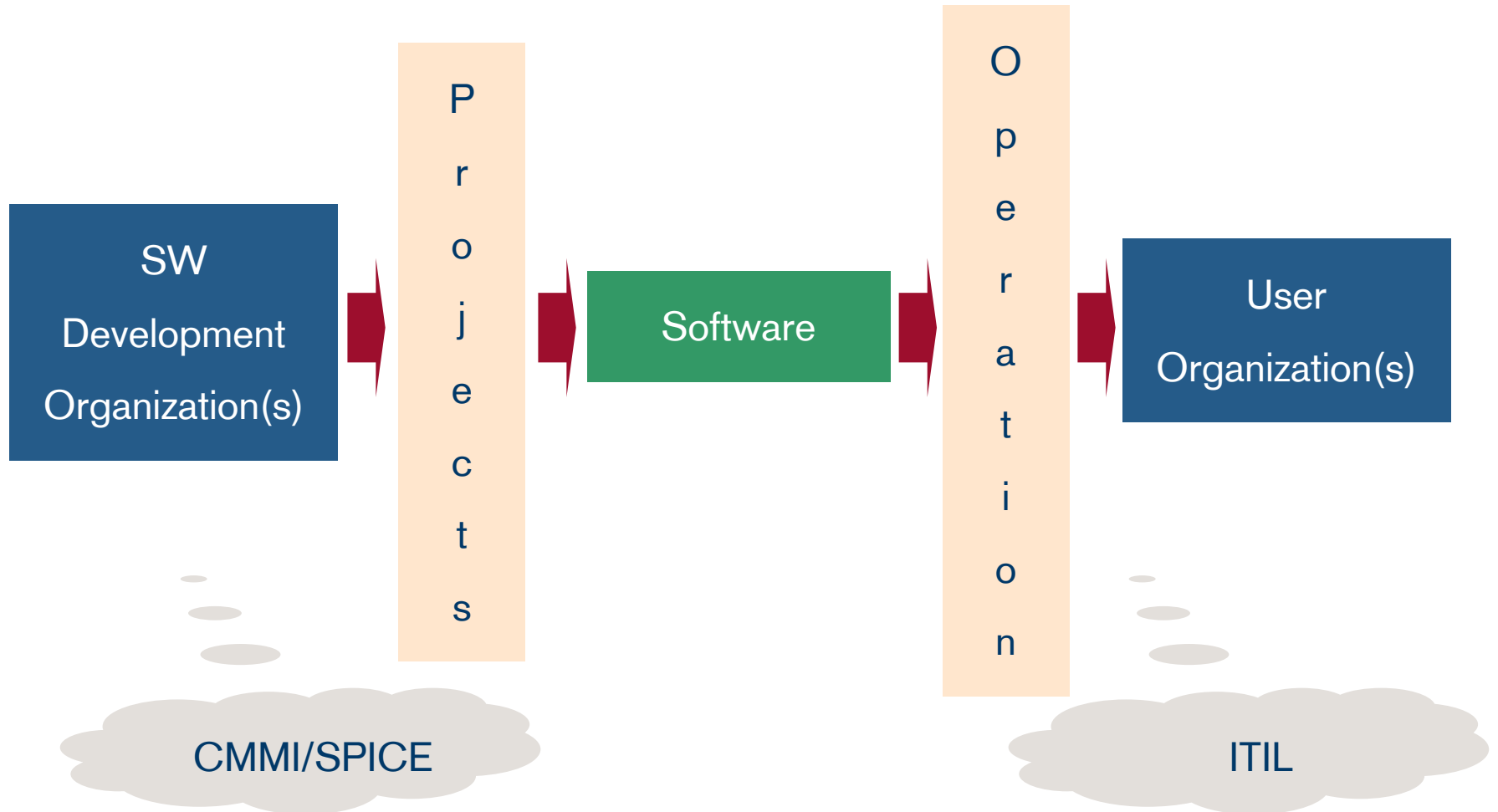
whoami

Author	Topic
IT Experience	34 Years
CMMI Experience	8 Years
Enterprise Architect	
Certified Quality System Manager	
Buddy of Knowledge ;-)	
Areas of interest <ul style="list-style-type: none">▪ Quantitative process management▪ Empirical Software Engineering▪ SOA	
<p>The talk comprises the last 20 years of software quality management, comparing the often hidden impact of changing organizational behaviour and structures on software architecture and quality – and vice versa.</p> <ul style="list-style-type: none">▪ Software and its environments▪ Quality of (quality) models▪ Software in large enterprises▪ Opportunities for research	

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Software and its environments



Software and its purpose

Example: Software's purpose within a global bank

- Purpose 1: to rationalize the bank -> efficiency, cost
- Purpose 2: to rationalize the customer -> cost, market share
- Purpose 3: to deal with other enterprises -> efficiency, market share

Do you expect any impact on the software's quality model?

Do you expect any impact on the requirements engineering?

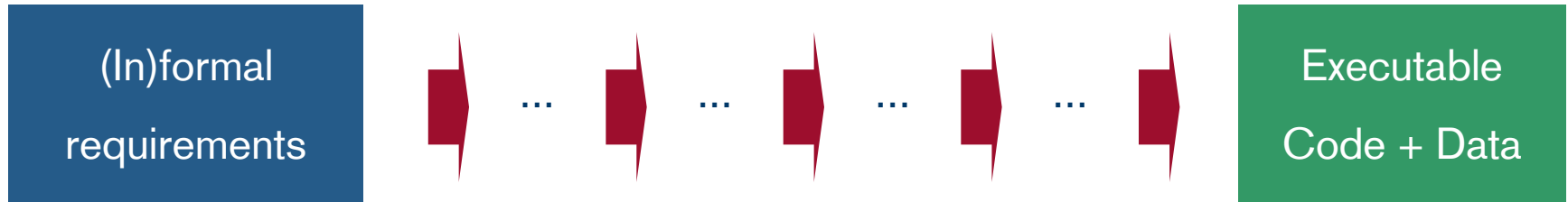
Organizational impact on software architecture

Organization has impact on

- Logical and physical data structures derived from business objects
- Data flows via use cases derived from business processes
- Software redesign decisions

Example: the long life of a banking branch ID in data bases

Software and its transformations in development



Any informal transformation step is a source of failure

-> Empirical results?

-> Solution/Examples?

-> What do other engineering disciplines?

Software and its transformations in structure

Software's shape in the last 60 years

- From spaghetti or modules in octal code or assembler
- ... to spaghetti or modules in higher languages
- ... to spaghetti or components in object oriented languages
- ... to spaghetti or SOA services in a dedicated hardware system
- ... to SOA in clouds?

3 ways to the truth or 3 names for the same?

Old and new disciplines

- Quality management, driven by manufacturing & service industry
- Business Analysis/Engineering, driven by consulting & faculties for economics
- Enterprise Architecture, driven by large enterprises and computer science

-> Need for synergies and delineation

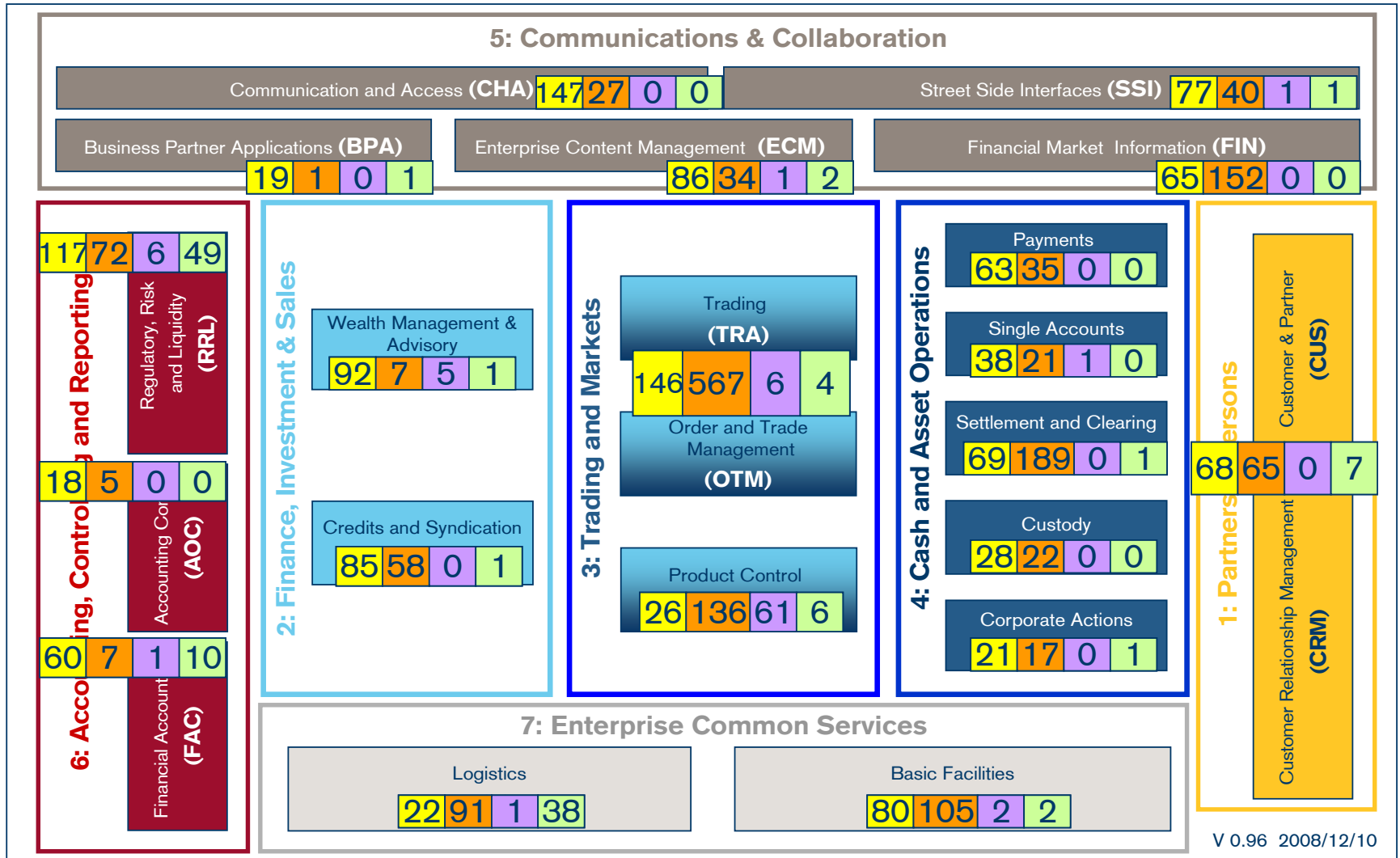
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Challenge no. 1 of large IT systems

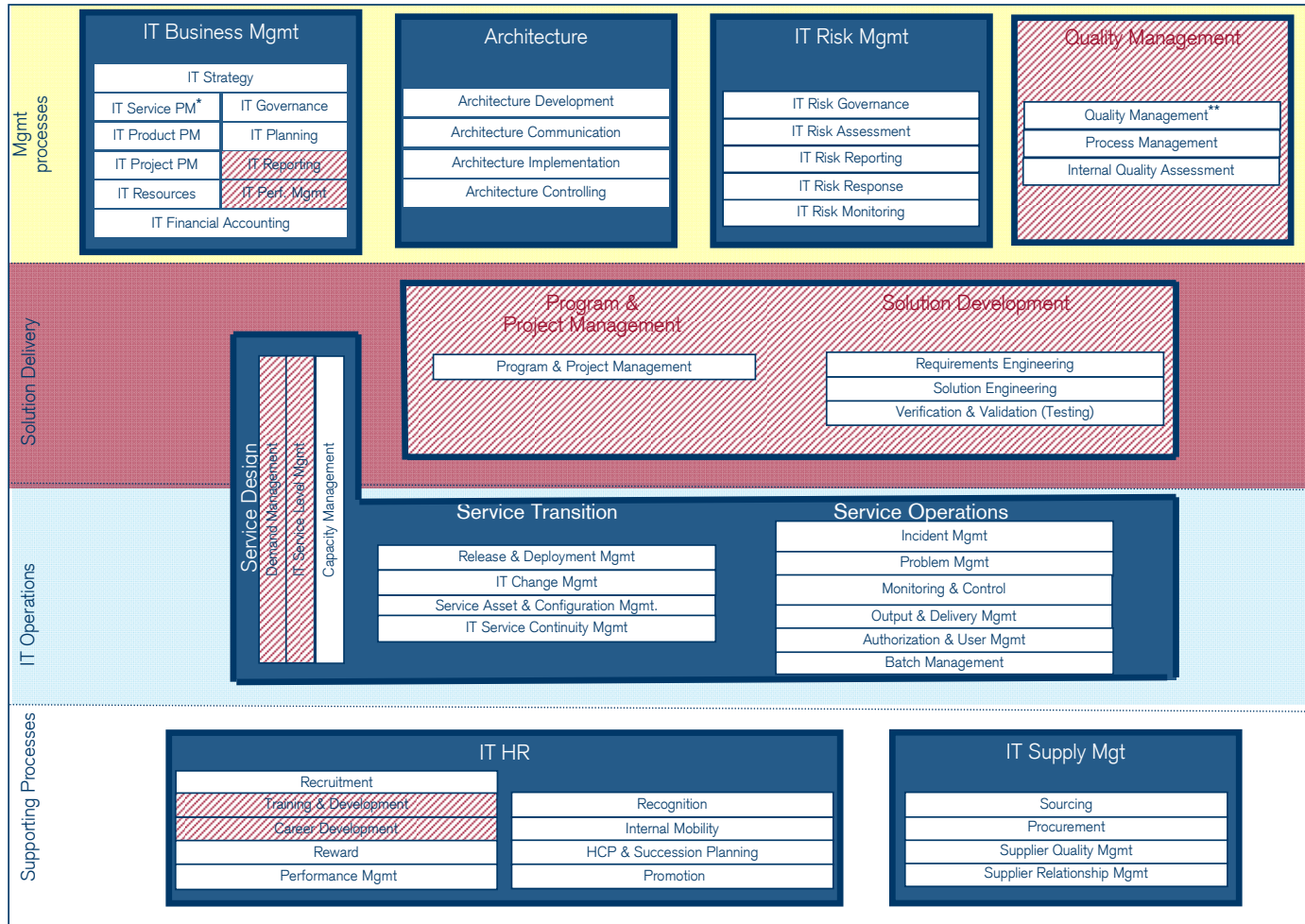


Complexity is: have ~6'700 applications



V 0.96 2008/12/10

Complexity is: have 14'000 people with 51 processes



* PM = Portfolio Management

** Renaming or break down still open (tbd with Quality Heads)



= in scope of the CH regional SD process governance (= CMMI)

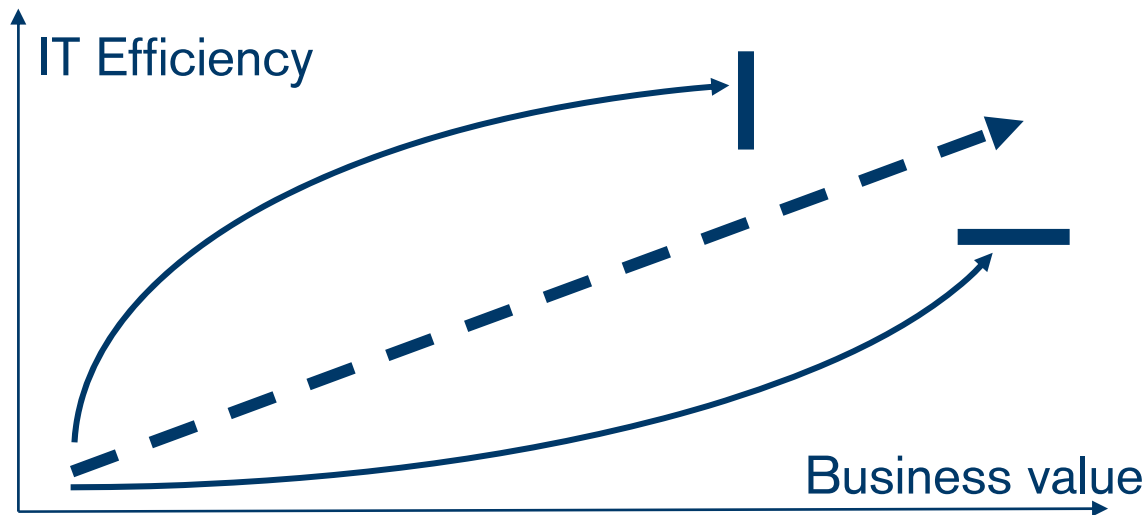
Characteristics of IT in the financial industry

- For 95%, banking business is financial **information processing**
 - > up to **25%** of a banks personnel is **in IT**
 - > a global banks IT isn't a cost center – its a **profit center**
- The business model of **software development in a global bank** is quite different from software development for the market:
 - **1** (in letters: one) huge customer, who **ownes SW development and operations**
 - **continuously changing** organizational structures, requirements – and releases
 - the weighting of **time-to-market**, cost and quality

The Managed Evolution of large IT systems*

Managed Evolution =

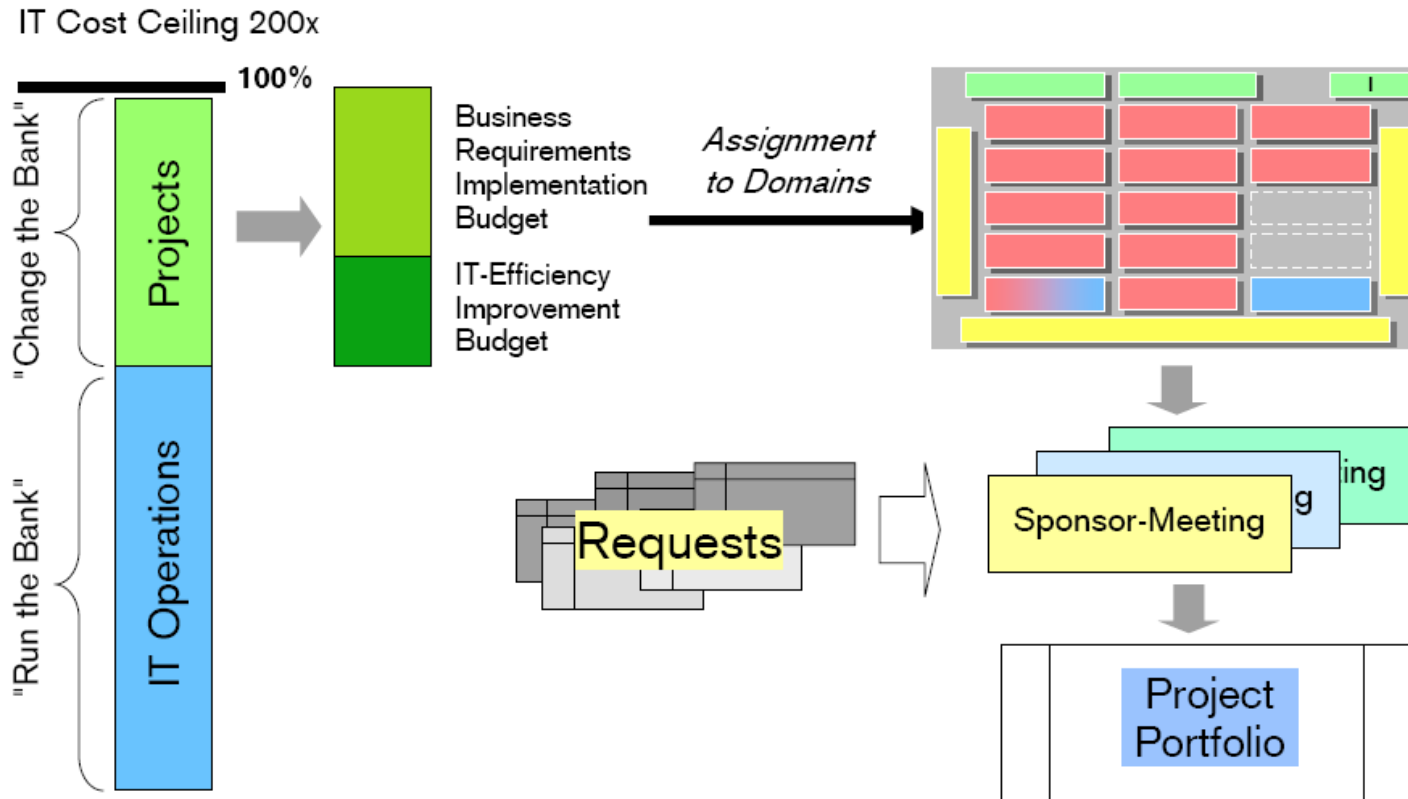
1. Gradual, incremental, risk-controlled change of the IT-system
2. Maintain a healthy balance between the creation of business value (= new functionality) and the improvement of IT efficiency
3. Treat existing applications as valuable assets



*Murer, Bonati, Furrer; Managed Evolution: A Strategy for Very Large Information Systems, Springer 2010

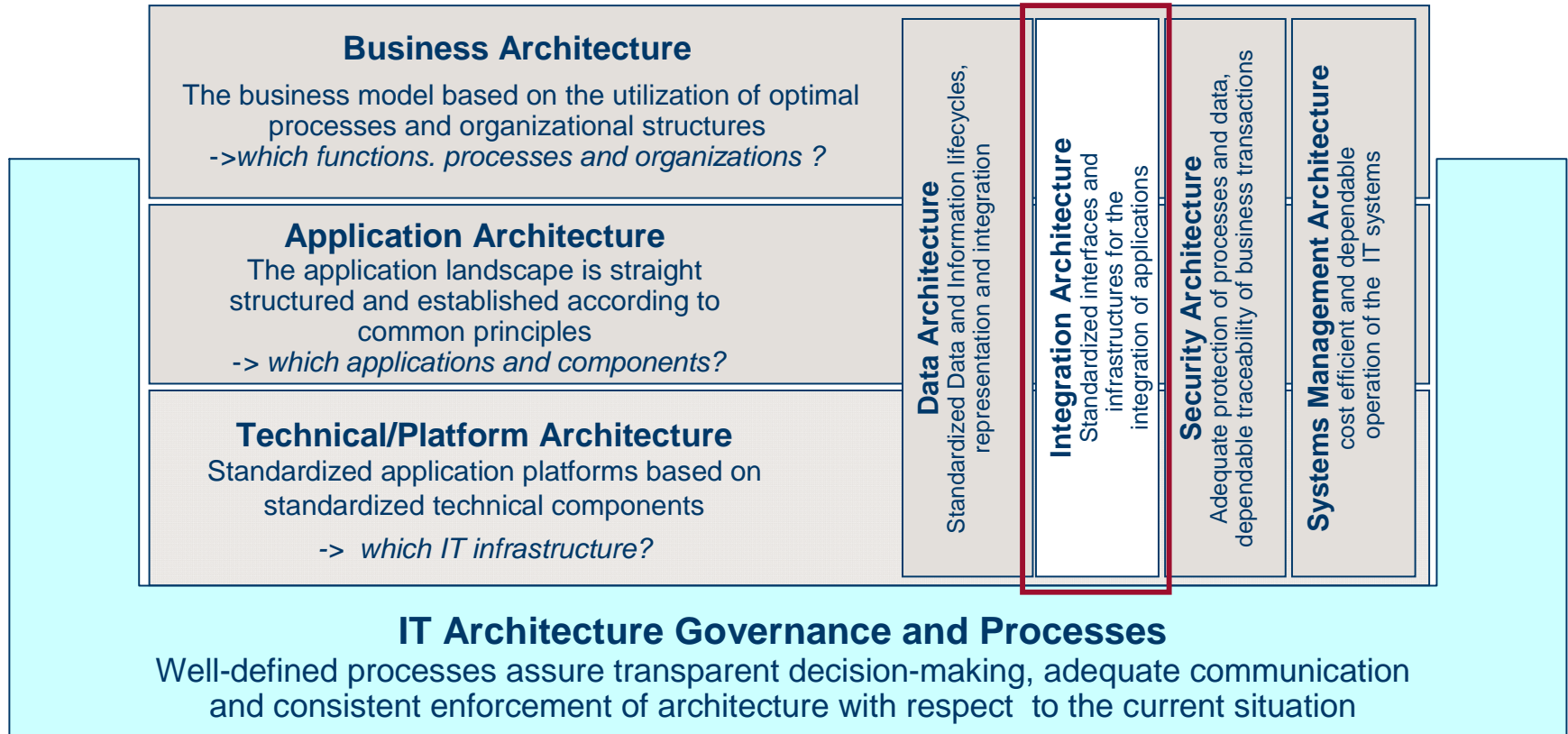
The Managed Evolution of large IT systems

STRATEGIC PLANNING



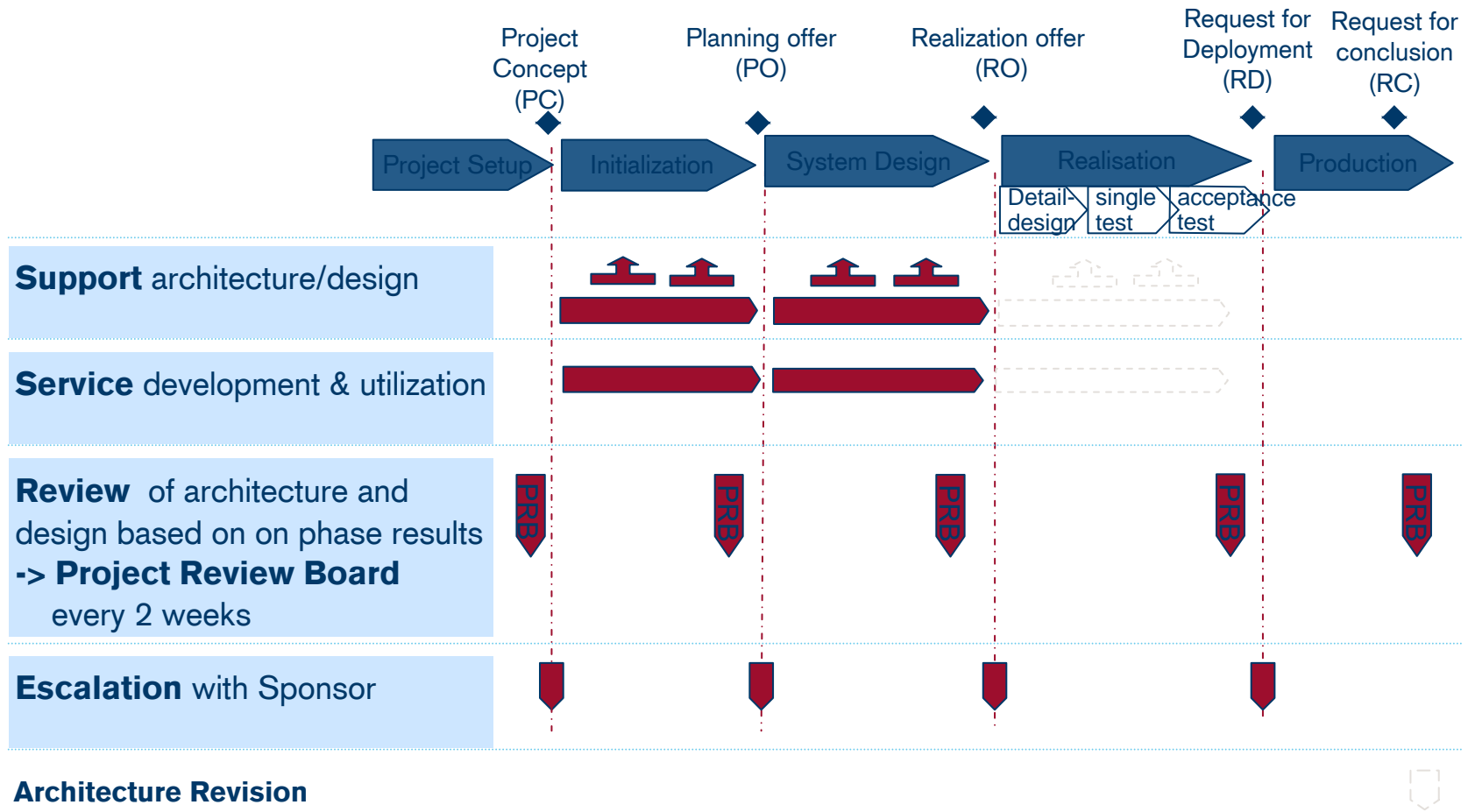
The Managed Evolution of large IT systems

IT Architecture governance & structure 1/2



The Managed Evolution of large IT systems

IT Architecture governance & structure 2/2



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Opportunities for research

Gaps in education curricula

For software engineers

- Maximal formalized quality models for standardized purposes
- Measurement of these criteria through automated software analysis
- Explicit inter-disciplinary research together with economists on
 - project procedure models
 - management of large application landscapes
- Measurable criteria for: the craziest piece of software ever

For managers

- Quality management in the context of MBA
- Software quality models

Thank you!



Contact

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