Agile Enterprise Architecture Management
Strategic IT Management in Turbulent Times
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1. Turbulent Times
   - Accelerating growth, heterogeneity, connectedness and change

2. Enterprise Architecture & Enterprise Architecture Management
   - Clarity, coherence and agility despite complexity
   - Business capability modeling

3. Agile Enterprise Architecture Management
   - Principles
   - Empirical results
   - Implementation using patterns and building blocks
Accelerating adoption rates for new technologies

Tablet, Sensors, …
Example of a disruptive technology

OMG, RIP txt
Messages sent per day, bn

Sources: Portio Research; a16z

Economist.com
Exponential growth starts inconspicuously, and humans are not used to reasoning about non-linear processes.

Source: 2012 Small and Medium Social Business Study, SMB Group
The legal complexity of international markets keeps growing.
Enterprises have to adapt their business capabilities to an increasingly turbulent environment.

Humans: Employees, Customers, Suppliers, Partners, Markets, Communities, ...
Laws & Regulations

Resources: Energy, Matter, Information, Technology...

Accelerating Changes

Disruptive Changes

Vision, Goals, Strategy

Business Capabilities

Procurement
Logistics
Sales

Holistic Optimization
Coherent Transformation

Information Management Capabilities

SCM
ERP
CRM

Accelerating Changes

Disruptive Changes

Resources: Energy, Matter, Information, Technology...
Research areas and ongoing projects

Enterprise Architecture Management (EAM)

- Application Landscape Complexity Metrics
- EAM Pattern Catalog 2015
- Big Data Architectures & Adoption
- Architecture Recommendation
- Architecture Simulation
- Application Portfolio Management
- Next-Generation Data Centers

Social Content & Model Management (SocioCortex)

- Spreadsheets 2.0
- Visual Content Analytics
- Model-based UI
- (Eco-) System Robustness
- Knowledge-Intensive Processes

Complexity Metrics

- EAM Pattern Catalog 2015
- Big Data Architectures & Adoption
- Architecture Recommendation
- Architecture Simulation
- Application Portfolio Management
- Next-Generation Data Centers

- Spreadsheets 2.0
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Research areas and ongoing projects

Service Platforms and Ecosystems

- Technical Platform Architecture
- Crowd Sourcing and Innovation
- Partner On- & Off-Boarding
- Integrated Multi-Level Monitoring
- TUM LLCM

Structural & Linguistic Law Analysis

- Vertical Social Software (VSS)
  - InCoBate
  - Collaborative Video Annotation
  - Collaborative Morphologic Analysis
  - Contextual Computing

Modeling & Management of Legal Norms

- Lexalyze
- Semantic Law Analysis / Executable Contracts
- Accountability in Socio-Technical Systems
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• $10^2$ – $10^3$ networked and highly diverse information systems
• Complexity ~ number of relationships between systems
• IT does not keep pace with accelerating speed of business
• Maintenance costs *eat up* IT budget and limit ability to transform
System complexity ~ number, variety and dynamicity of elements and their dependencies

IT Architecture Management

Business Architecture Management

Drivers

- Local Decision Making / Politics
- Development of Technology / IT Industry
- Mergers & Acquisitions
- Local Decision Making / Politics
- Business Model
- Regulation

see also [3]
The BEAMS Enterprise Architecture Framework

Common language for business and IT

- Technical, social, economic and legal aspects
- Layers and crosscutting concerns
- Static and dynamic relationships more important than element details
- Current, planned and target architecture
Most frequent EA challenges

1. Ad hoc EAM demands
2. Unclear business goals
3. Hard to find experienced enterprise architects
4. EA demands unclear for EAM team
5. Enterprise environment changes too quickly

## Business capability

**Definition**

A functional building block of the business architecture that supports the business model and the business strategy. It defines the organization’s capacity to successfully perform a unique business activity.

<table>
<thead>
<tr>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
</tr>
<tr>
<td>- independent from the organizational model, technologies, and vendor solutions</td>
</tr>
<tr>
<td>Abstraction</td>
</tr>
<tr>
<td>- encapsulate and abstract from any explicit resource, business process, or IT</td>
</tr>
<tr>
<td>Horizontal Structure</td>
</tr>
<tr>
<td>- a complete and non-overlapping functional decomposition of the enterprise</td>
</tr>
<tr>
<td>Vertical Structure</td>
</tr>
<tr>
<td>- can be broken down into more granular business capabilities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>People Dimension: knowledge, skills, and experiences of the enterprise’s staff</td>
</tr>
<tr>
<td>Process Dimension: concepts, business processes, and information management</td>
</tr>
<tr>
<td>Material Dimension: underlying assets, such as infrastructure, IT, and equipment</td>
</tr>
</tbody>
</table>
Business capabilities in context

**Business Model**
Complete view on value creation

**Business Capability Map**
Complete and non-overlapping view on the enterprise's business capabilities

**Business Capability**
View on one business capability with its dimensions and lifecycle
Using a business capability map to communicate business goals.

**SR-Map**
- Strategic Relevance Map

**CC-Map**
- Capability Condition Map

**SG-Map**
- Strategic Gap Map

**Sales and Service**
- Customer Relationship Management
- Customer Advice (non-fee services)
- Product and Service Sales
- Customer Portfolio Management
- Business Partner Management

**Product and Service Processing**
- Internal Product Processing
- Third-party Product Processing
- Value-rich Service Delivery
- Utility Service Delivery

**Business Management and Planning**
- Strategic Planning
- Bank Governance
- Regulatory Compliance
- Cash and Liquidity Mgmt.
- Savings and Investment
- Financial Management

**Marketing and Intelligence**
- Market Intelligence
- Bank Marketing
- Customer Intelligence
- Partner Intelligence

**Product and Service Procurement**
- Internal Demand
- Third-party Products
- Utility Services

**Product and Services Design and Marketing**
- Product/Service Design
- Third-party Research
- Product Marketing

**Bank Support**
- Human Resources
- ICT Management
- Facility Management
- Corporate Communications
- Security
- Collaboration
- Archiving and Document Mgmt.
- Risk Management
- Reporting
- Accounting

**High strategic relevance**

**Medium strategic relevance**

**Low strategic relevance**
Using a business capability map to assess the current capabilities.

**SR-Map**
- Strategic Relevance Map

**CC-Map**
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<table>
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<th>Capability Condition Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced condition</td>
</tr>
<tr>
<td>Medium condition</td>
</tr>
<tr>
<td>Poor condition</td>
</tr>
</tbody>
</table>

**SR-Map**

**CC-Map**

**SG-Map**

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- Security
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- Risk Management
- Reporting
- Accounting
Using a business capability map to identify EA demands.
## Overview

1. **Turbulent Times**
   - Accelerating growth, heterogeneity, connectedness and change

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3. **Agile Enterprise Architecture Management**
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The management approach has to fit the problem at hand.

The diagram illustrates the relationship between the complexity of the problem and the dynamicity of the problem. The x-axis represents the complexity of the problem, ranging from low to high. The y-axis represents the dynamicity of the problem, ranging from low to high. The area above the diagonal line represents chaotic conditions, while the area below the diagonal line represents mostly stable conditions. The transition from dynamic to turbulent occurs in the middle area of the graph.
The management approach has to fit the problem at hand.

- Spezialize & automate (Taylorism)
- Experiment & learn (MVP)
- Manage collaboratively (emergent structure)

Dynamics of the problem:
- Low & low
- High & high

Complexity of the problem:
- Low
- High
Agile EA management principles
Individuals and interactions over formal processes and tools

- Ensure top management support
- Maintain a good relationship to people from other management areas
Agile EA management principles
Focus on demands of top stakeholders and their language(s)

- Spend 75% of your time on communication
- Avoid waste, be lean
- A single number or a picture may be more helpful than 10 reports
- Work towards a shared language
- Clarify relationship to existing modeling activities
Agile EA management principles
Reflect behavior and adapt to changes

- Design and deliver in short cycles (~12 months)
- Continuous collaboration
- Use best practice building blocks and patterns
- Request 360° feedback
- Adapt models and processes
Eine lebendige Community ist ein wesentlicher Erfolgsfaktor.
Example: ABN AMRO

How to become “buddies of war” with stakeholders?

How to convince and co-operate?

- Tell me and I will forget
- Show me and I will remember
- Involve me and I will understand
- (Enforce me and I will resist)
Redeveloping the entire system set is quite an investment. *Do they dare to jump with you into the deep?*
A transformation unit
A transformation network
Jede BU durchläuft den EAM-Prozess in ihrer individuellen Detailtiefe und Geschwindigkeit. Grund: Die BUs haben einen unterschiedlichen Reifegrad in Bezug auf EAM.
Establish a lean set of processes and rules…

…instead of overloading the stakeholders with bureaucratic processes and unsolicited artifacts

Adopt evolutionary problem solving…

…instead of blueprinting the whole future rigidly on a drawing board

Foster and moderate open participation…

…instead of relying only on experts and top-down wisdom

Adoption of agile management principles
Survey among European enterprise architects (Q4 2013, n=105)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operates cross-functional</td>
<td>95%</td>
</tr>
<tr>
<td>Incremental</td>
<td>89%</td>
</tr>
<tr>
<td>Iterative</td>
<td>81%</td>
</tr>
<tr>
<td>Performs tasks in self-organized manner</td>
<td>77%</td>
</tr>
<tr>
<td>Specialized to perform various tasks</td>
<td>76%</td>
</tr>
<tr>
<td>Incorporation of reflections &amp; retrospectives</td>
<td>73%</td>
</tr>
<tr>
<td>EAM team incorporates feedback</td>
<td>72%</td>
</tr>
<tr>
<td>Leader acts as servant for the team</td>
<td>72%</td>
</tr>
<tr>
<td>Leader fosters team’s self-organization</td>
<td>68%</td>
</tr>
<tr>
<td>As simple and accessible as possible</td>
<td>67%</td>
</tr>
<tr>
<td>Usable for stakeholders</td>
<td>67%</td>
</tr>
<tr>
<td>Common language</td>
<td>66%</td>
</tr>
<tr>
<td>Foster learning by experiments</td>
<td>65%</td>
</tr>
<tr>
<td>Early delivery</td>
<td>65%</td>
</tr>
<tr>
<td>Members know their colleagues’ duties</td>
<td>64%</td>
</tr>
<tr>
<td>Diplomacy and negotiation skills</td>
<td>62%</td>
</tr>
<tr>
<td>Accomplishes EAM tasks in small subteams</td>
<td>60%</td>
</tr>
<tr>
<td>Characterized by defined roles &amp; responsibilities</td>
<td>60%</td>
</tr>
<tr>
<td>Focus on high-quality</td>
<td>55%</td>
</tr>
<tr>
<td>Satisfy stakeholders</td>
<td>54%</td>
</tr>
<tr>
<td>Stakeholders provide feedback to EAM team</td>
<td>52%</td>
</tr>
<tr>
<td>Focus on requirements</td>
<td>51%</td>
</tr>
<tr>
<td>Clear definition of roles &amp; responsibilities</td>
<td>49%</td>
</tr>
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Architecture management has to be integrated with other management functions.

Architectural changes are performed through a coherent set of projects.

Example of a mature IT organization
Influence factors for EAM

Enterprise Context
Organizational Context
EAM Goals
EAM Questions

Influence factors changing over time
Maturity of other (IT) management functions

EAM Questions

Organizational Context

EAM Goals

Enterprise Context

Influence factors for EAM
The idea behind the EAM pattern catalog 1.0

Tailor the EAM to the specific situation (*pains*) of the enterprise and follow an incremental strategy based on **EAM patterns** representing proven practices.

Systematically document the dependencies between

- **Individual management concerns,**
  Which concern is relevant for which stakeholder?

- **Methodology patterns (M-Pattern),**
  Which activities are required to address a concern?

- **Viewpoint patterns (V-Pattern) and**
  Which viewpoints help stakeholders to collaboratively perform the activities?

- **Information model patterns (I-Pattern)**
  Which information has to be available to generate a view?

Draw attention to the consequences implied by a pattern (labor, required information, *political* resistance, …)
Overview of the pattern catalog version 1.0

- Basis: literature, experience from sebis research projects, structured interviews of 25 enterprise architects
- Selection based on relevance and adoption by an extensive online questionnaire

⇒ 43 concerns, 20 M-Patterns, 53 V-Patterns, and 47 I-Patterns
EAM PC 2015: Conceptual overview

Stakeholders

- **S1**
- **S2**
- **S3**

Concerns

- **C1**
- **C2**
- **C3**

Method Patterns

**Architecture Principles**

- **M1**
- **P1**

Viewpoint Patterns

- **V1**
- **V2**
- **V3**

Information Model Patterns

- **I1**
- **I2**
- **I3**

Data Collection Patterns

- **DC1**
- **DC2**
- **DC3**

**Concerns**

- **C1**: e.g. reduce functional redundancy
- **C2**: e.g. Management of Homogeneity, Buy before make
- **C3**: e.g. Business Support Map

**Information Model Patterns**

- **I1**: e.g. Business Capabilities, Business Applications & Business Support
- **I2**: e.g. Business Support Map
- **I3**: e.g. Business Capabilities, Business Applications & Business Support

**Data Collection Patterns**

- **DC1**: e.g. import monthly from CMDB
1. Increasing business complexity and environmental volatility create a demand for **holistic optimization** and **coherent transformation**.

2. **Business capabilities** and business capability maps provide (black-box) abstractions beneficial and accessible for many stakeholders and enterprises of various sizes.

   They provide a **stable architectural reference** for strategic modeling tasks in turbulent environments.

3. Enterprise (business, domain, IT, software, …) architects should
   - adapt their management approach to the dynamicity and complexity of the problems at hand
   - apply **agile principles**
   - utilize practice-proven **patterns and building blocks**
Thank you for your attention. Questions?
Enterprise architect education and certification

Enterprise architect should become a profession and not just a job title.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Program/Conference</th>
</tr>
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<tbody>
<tr>
<td>Master Course Business Informatics</td>
<td>Strategic IT Management and EAM</td>
</tr>
<tr>
<td>Euro CIO Professional Programme</td>
<td>Business and Enterprise Architecture</td>
</tr>
<tr>
<td>EAMKON Conferences &amp; Workshops</td>
<td></td>
</tr>
<tr>
<td>User Group Architekturmanagement</td>
<td></td>
</tr>
<tr>
<td>EAM Grundlagen für die Praxis</td>
<td></td>
</tr>
<tr>
<td>GI Arbeitskreis Unternehmensarchitektur</td>
<td>Leitung Fachgruppe Architekturen,</td>
</tr>
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