Enterprise Architecture Risks – An Overview

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Introduction

➢ Enterprise Architecture (EA) is an approach for controlling complexities and constant changes in the business environment

➢ EA has become an important management tool by providing the "big picture" of an organization

➢ EA requires considerable investments

➢ EA is extensive, continuous and iterative approach which further complicates EA risk identification and management

➢ All of EA's components (e.g. processes and products) and domains (e.g. business and technology) may involve risks

➢ EA is an important strategic management approach -> realization of risks can cause serious effects

➢ Research on EA risks is scarce

Research Questions

1) What EA risks exist?

2) How can EA risks be classified?

3) How can EA risks be managed?

4) How is EA risks management connected with organizational risk management?

Research Process

1) **Literature review**

   – Identification of sets of risks

   – Charting for potential risk classifications

   – Scrutinizing the nature of EA risk management

   – Adopting one feasible classification scheme and a set of generic risks and adapting them to the EA context

2) **Focus group interview**

   – Five practitioners from three organizations

   – Validation

   – Collection of experience-based information

3) **Consolidation and analysis**

Definitions and Conceptualizations of Risk

➢ Many meanings in risk literature

➢ "The possibility of incurring misfortune or loss" (the Collins English Dictionary)

➢ Many characteristics (e.g. severity, volatility, propability, time horizon)

➢ Many conceptualizations (in IS domain, see e.g. Sherer & Alter 2004)
- Risks as different types of negative outcomes (risk components)
- Risk as probability of negative outcomes
- Risk as difficulty in estimating outcome
- Risks as factors leading to a loss

➢ Risks can also be positive (see e.g. Alter & Sherer 2004)

➢ Enterprise Architecture Risks:
1. any factors that may lead to negative outcomes in the EA program
2. any negative outcomes resulting from these factors (may be more important in practice)

Risk Classifications

➢ Typically, the proposed risk categories depict the function, task, object or entity the risk is related to

➢ Generic risks

- Business, market, operations and credit risks (Crouhy et al. 2001; Lam 2003)
- Known, predictable or unpredictable risks (Keyes 2005)

➢ IS and ICT risks

- Project, technical and business risks (Keyes 2005)
- Firm-specific, competition and market risks (Benaroch 2002)
- Application, organizational and interorganizational level risks (Bandyopadhyay 1999)
- Risks classified by IS life cycle phases (Sherer & Alter 2004)
- Risks classified by work system components (Sherer & Alter 2004)

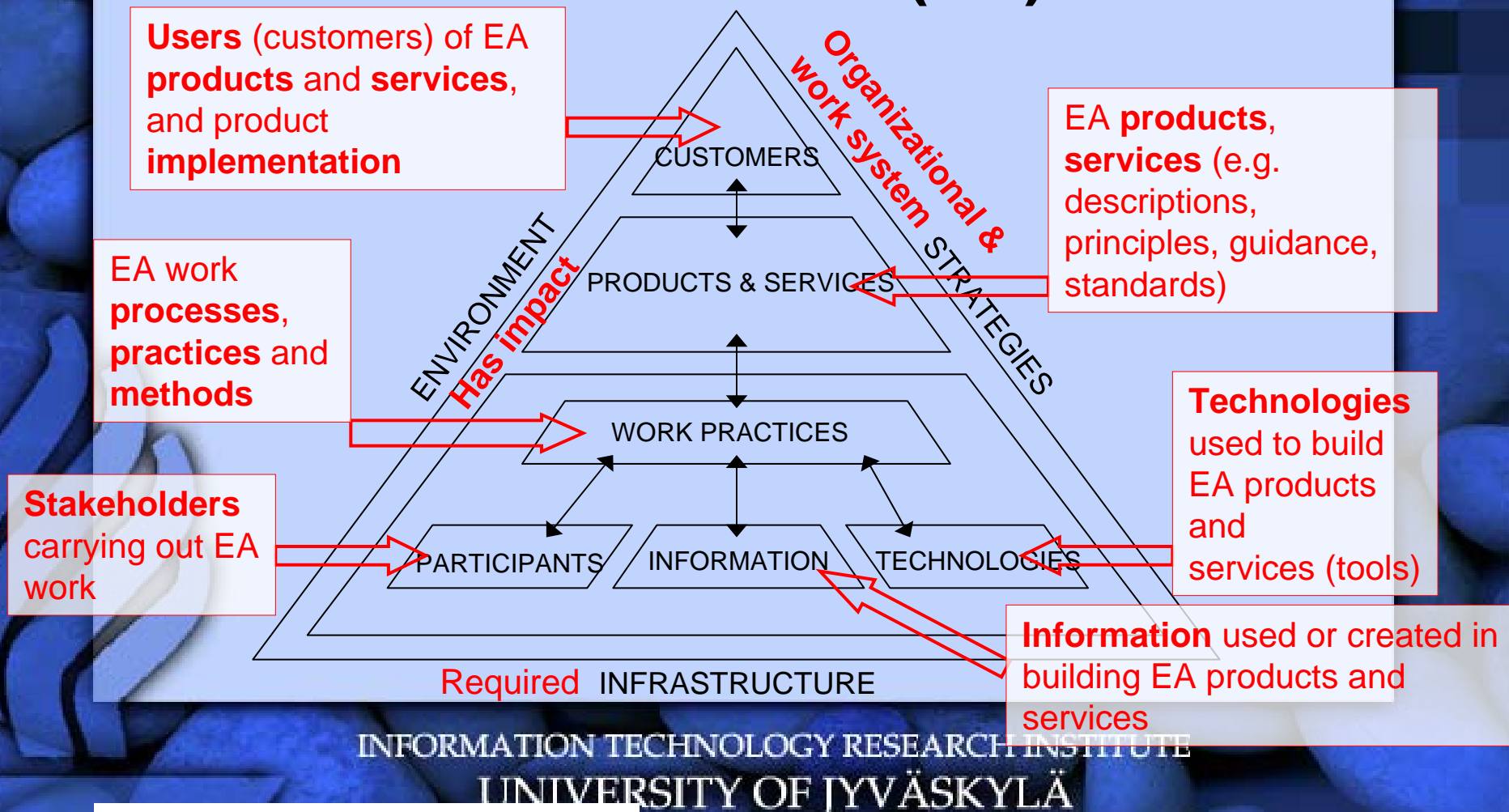# Views on Enterprise Architecture Risks

➤ **Architectural risks (Avritzer & Weyuker 1998)**
  – Project management, requirements and performance-related risks

➤ **EA investment risk factors (Saha 2006)**
  – Organization specific, competitive, market, and technical risks
  – Derived from ICT risk literature

➤ **EA risks on and between the levels of EA (Baldwin 2007)**
  – E.g. business, information, information systems, technology

➤ **Architecture pitfalls (Rehkopf & Wybolt 2003)**
  – E.g. declaring the architecture effort "done", assuming that technical people make good architects, failing to communicate early and often, and forgetting to assess people and process impacts

➤ **EA critical problems (Kaisler et al. 2005)**
  – EA modeling, management and maintenance-related problems

➤ **EA critical success factors (Ylimäki 2006)**
  – E.g. scoping and purpose, architecture models and artifacts, business-drivenness, assessment, commitment, communication
  – Potential risk areas

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Enterprise Architecture Risk Classification (1/3)

The work system framework of risks (see Sherer & Alter 2004) was adapted to this study because

➢ It is generic

➢ It has an extensive literature base

➢ Generic work system risks apply to the IS context (Sherer & Alter 2004), suggesting that they may apply to the EA context as well

➢ The framework shares the same conceptualization of risk with this study

➢ The model provides a meaningful context to classify risks, understandable by not only technically-oriented persons but business personnel as well (Sherer & Alter 2004)

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Enterprise Architecture Risk Classification (3/3)

➢ Each of the elements in the frameworks has its own life cycle and even inside the elements different objects may have particular life cycles

➢ It is important to consider implemented EA as a source of risks

➢ All of the elements include the aspects of security and competence

➢ Partners can be a source of risks but they cannot be associated with one particular element due to their different roles

➢ Management has a significant impact on EA work but it is difficult to classify management to any single element due to its many roles

Source: Focus group interview

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Examples of Potential Enterprise Architecture Risks

	Factors leading to negative outcomes	Negative outcomes
Work practices	▪Poorly designed processes ▪Insufficient resources ▪*Insufficient organizational security*	▪Inadequate performance ▪*Insufficient predictability of outcomes* ▪*Insufficient documentation*
Products and services	▪Incompatibility between customer requirements and products or services	▪Lack of use ▪Dissatisfaction
Customers	▪Disagreement regarding the requirements for products and services ▪Difficulty in using products or services ▪*Inadequate implementation of EA products and services*	▪Lack of use of products and services ▪Dissatisfaction ▪*Misuse or misinterpretation of EA products* ▪*Insufficient realization of EA objectives*
Technologies	▪*Dependence on technology providers* ▪Inadequate usability of technology ▪Incompatibility between technologies	▪*Inadequate EA process performance* ▪*Participant frustration*

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Sources: Sherer & Alter 2004; *Focus group interview*
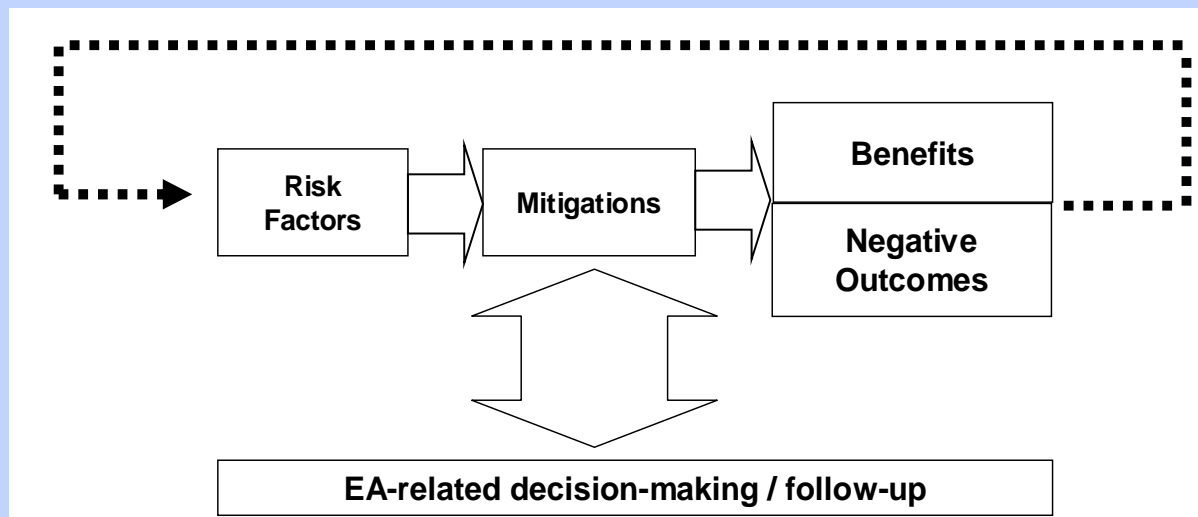
Enterprise Architecture Risk Management (1/4)

➢ Risk management aims at helping the organization in achieving its objectives (Lam 2003)

➢ Risk management involves balancing 1) risk and reward, and 2) processes and people (Lam 2003)

➢ Risk management process involves
   – Risk awareness and identification
   – Risk measurement and analysis
   – Risk control

➢ EA success vs. organizational success
   – EA risk management supports the attainment of EA objectives (c.f. Lam 2003)
   – Successful EA supports the attainment of organizational objectives (Hoogervorst 2004)
   – EA is a tool for facilitating organizational risk management (Morganwalp & Sage 2004; Focus group interview)

Enterprise Architecture Risk Management (2/4)

- ➢ EA risk management responsibilities
  - – EA risk management is one of the tasks of EA management (governance)
  - – Risk identification: responsiblity of the EA management team, assisted by everyone carrying out EA work
  - – Risk measurement: responsibility of the EA management team
  - – Risk control: responsibility of the EA management team
- ➢ EA risk management is linked to EA maturity
- ➢ EA risk management vs. organizational risk management
  - – EA risk management should not be separate from organizational risk management
  - – EA risks can be considered as one category or type of risks the organization's risk management needs to deal with
  - – General risk management practices should be applied in the EA domain
  - – EA-related risks are not currently considered in detail in organizations but there seems to be the need of identifying, measuring and controlling them

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Source: Focus group interview

Enterprise Architecture Risk Management (3/4)

EA risk management vs. EA-related decision-making

EA risks are one criterion for EA-related decision-making which aims at optimizing the risk-benefit ratio

Sources: Benaroch, et al. 2006 (adapted); Focus group interview

Enterprise Architecture Risk Management (4/4)

➤ EA risk management can be supported by

- Efficient and adequate communication on EA issues using a common language that is understandable by each stakeholder

- Proper documentation of EA products and services

- Clear, sufficiently extensive risk management responsibilities: who is the "owner" of risk?

- Defining EA risk limits: the EA does not need to be perfect

Source: Focus group interview

Summary and Conclusions (1/2)

- ➤ EA risks:
  1. any factors that may lead to negative outcomes in the EA program
  2. any negative outcomes resulting from these factors (may be more important in practice)

- ➤ The work system framework was considered generic enough by the focus group to be used in the EA context but several comments regarding it were brought out

- ➤ The focus group generally agreed with the generic EA work system risks presented and provided a number of additional risks and examples of their realization in practice

Summary and Conclusions (2/2)

➢ Contributions
- Practitioners can use the results to identify typical risks related to each element in the EA work system, and to assure that risk management practices have been planned for all relevant risks
- The EA work system framework may be used to structure the EA approach in organizations or in research

➢ Further research
- Studying the significance of the identified EA risks and uncovering concrete examples of their realization in practice
- Investigating the temporal nature of EA risks
- Uncovering the actual causal chains of EA risks and effects
- Quantifying the effects of EA risks
- Scrutinizing how to implement EA risk management as an organized, continuous activity that is linked to the organization's generic risk management