Evaluation Needs for Enterprise Architecture

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Objectives of the Study

- What does (program) evaluation mean?
- How to plan an EA evaluation? Which issues need to be addressed?
    - → Components of evaluation planning
- What are the needs for EA evaluation in terms of the evaluation components?
    - EA objectives: why to develop EA?
    - Evaluation purposes: why to evaluate EA?
    - Audiences: who needs the evaluation results?
    - Evaluation targets: which aspects of EA to evaluate?
    - (Attributes: what characterizes the evaluation targets?)

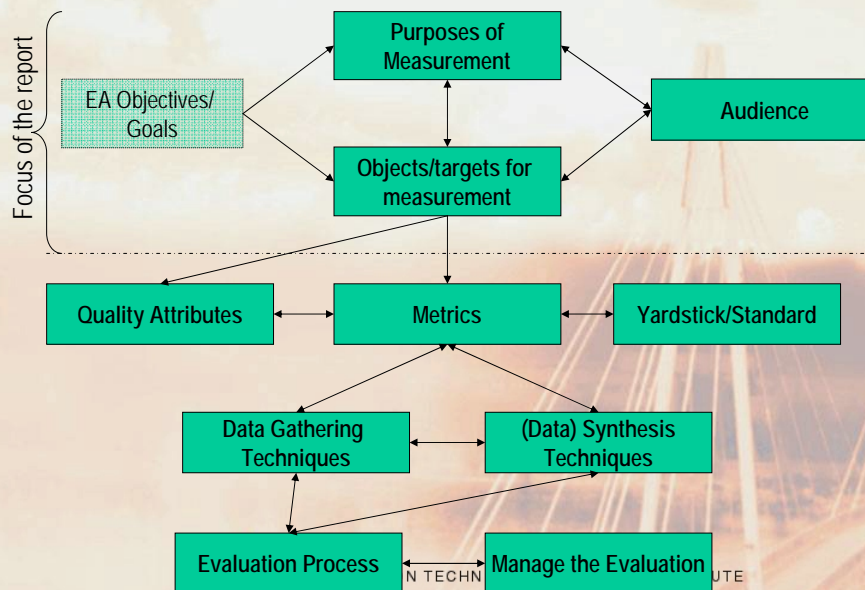INFORMATION TECHNOLOGY RESEARCH INSTITUTE

What Does Evaluation Mean?

- Evaluation is "a process of determining merit, worth, or significance" (Lopez 2000)
- "The thoughtful process of focusing on questions and topics of concern, collecting appropriate information for a specific use and purpose" (Taylor-Powell, Steele et al. 1996)
- No general theory exists, various approaches can be used (see e.g. Fitzpatrick et al. 2004)
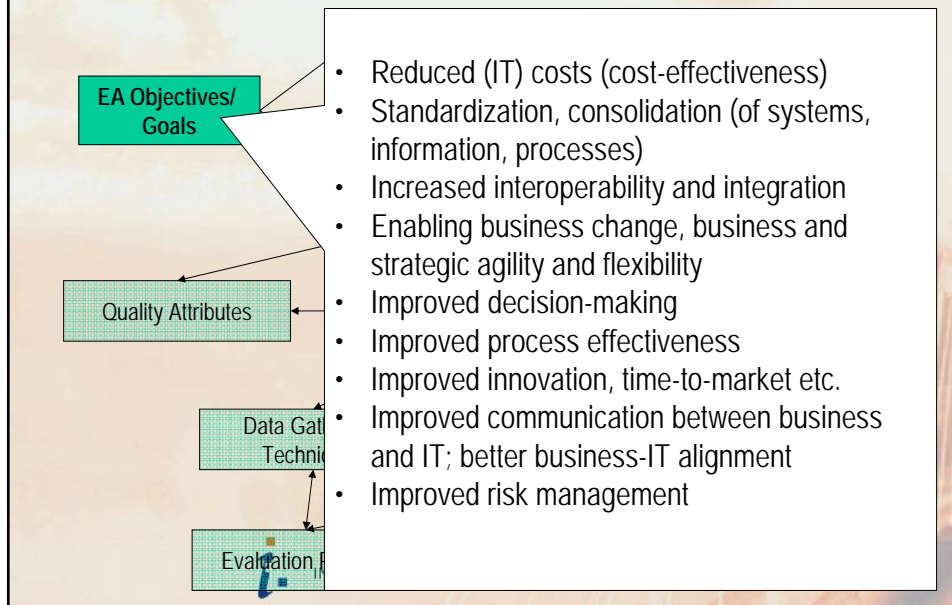- Typically, evaluation focuses on either products or processes

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EA Evaluation Components

Focus of the report

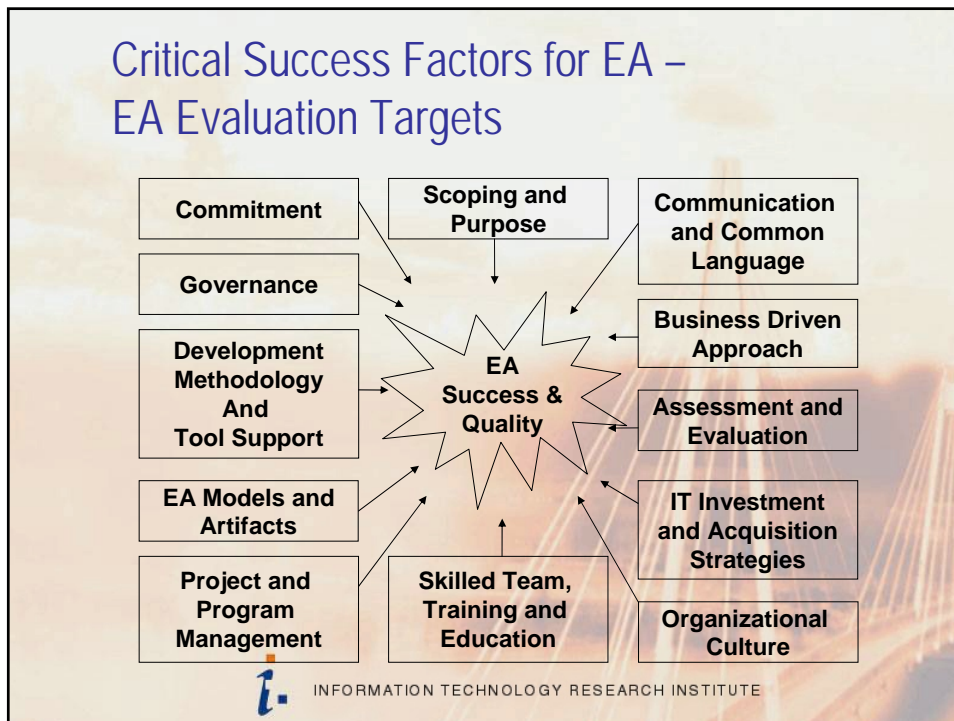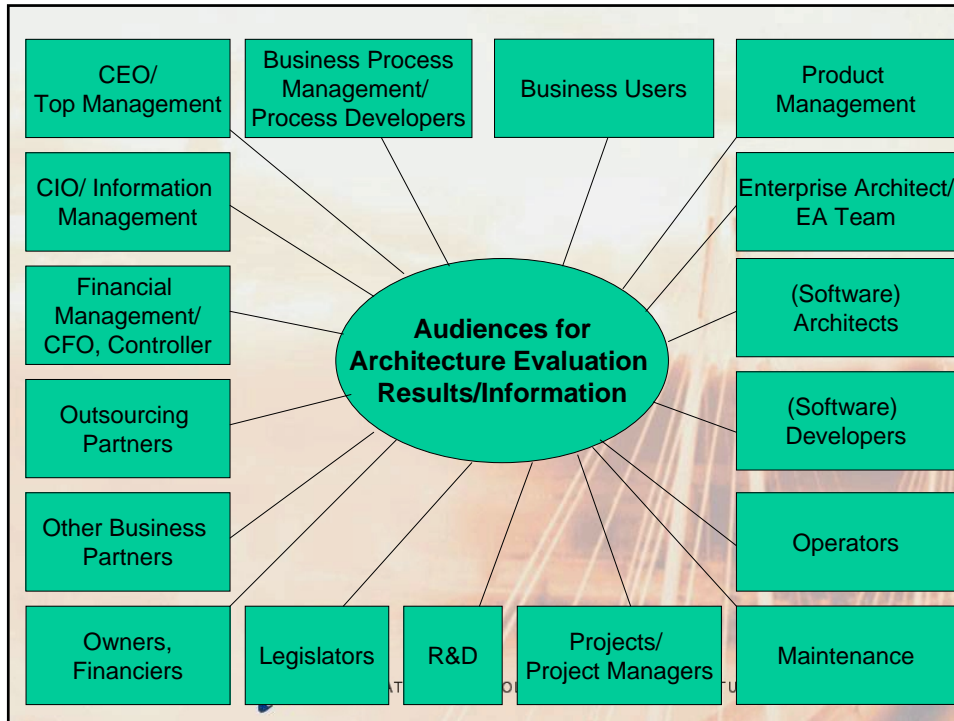- EA Objectives/Goals
- Purposes of Measurement
- Audience
- Objects/targets for measurement
- Quality Attributes
- Metrics
- Yardstick/Standard
- Data Gathering Techniques
- (Data) Synthesis Techniques
- Evaluation Process
- Manage the Evaluation

Examples of EA Objectives

EA Objectives/
Goals

Quality Attributes

Data Gat
Techni

Evaluation

- Reduced (IT) costs (cost-effectiveness)
- Standardization, consolidation (of systems, information, processes)
- Increased interoperability and integration
- Enabling business change, business and strategic agility and flexibility
- Improved decision-making
- Improved process effectiveness
- Improved innovation, time-to-market etc.
- Improved communication between business and IT; better business-IT alignment
- Improved risk management

Examples of EA Evaluation Purposes

Purposes of
Measurement

EA Objectives/

Audience

- To determine if the EA objectives are achieved
- To aid decision-making related to e.g.
  – the EA program itself
  – the selection among different architecture solutions
  – the business, ICT investments etc.
- To provide stakeholders with accurate accounting of the results of the architectural work, e.g.
  – to assess benefits and gains of EA or EA program
  – to assure that the results of EA or EA program are positive
- To provide balanced information on strengths and weaknesses of
  – EA, EA program (EA maturity)
  – organization's EA readiness/EA capability etc.

Audiences for Architecture Evaluation Results/Information

- CEO/ Top Management
- Business Process Management/ Process Developers
- Business Users
- Product Management
- CIO/ Information Management
- Financial Management/ CFO, Controller
- Outsourcing Partners
- Other Business Partners
- Owners, Financiers
- Legislators
- R&D
- Projects/ Project Managers
- Enterprise Architect/ EA Team
- (Software) Architects
- (Software) Developers
- Operators
- Maintenance

Critical Success Factors for EA – EA Evaluation Targets

EA Success & Quality

- Commitment
- Scoping and Purpose
- Communication and Common Language
- Governance
- Development Methodology And Tool Support
- Business Driven Approach
- Assessment and Evaluation
- EA Models and Artifacts
- Project and Program Management
- Skilled Team, Training and Education
- IT Investment and Acquisition Strategies
- Organizational Culture

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Evaluation Needs – Scoping and Purpose

Commitment

Scoping and Purpose

Communication and Common

- To what extent are the objectives and benefits of the architecture approach identified, documented and approved in the organization? How clear or understandable are the objectives and benefits?
- **Are the objectives derived from the business or IT strategies of the organization** (FGI 2006)?
- To what extent are the stakeholders of EA and their concerns identified?
- To what extent does the architectural work cover the organization?
- **What is the scope of the EA? How has it changed/expanded during the last quarter/year etc.? How controllable is the EA scope?** (FGI 2006)
- To what extent are the objectives and benefits of the architecture approach evaluated in order to ensure that they are met?

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Evaluation Needs – Business Driven Approach

E.g.
- To what extent are the business requirements taken into account in architectural planning?
- To what extent are the business requirements identified and documented?
- To what extent are the business requirements prioritized and how they are prioritized? To what extent are they conflicting or competing? **To what extent is the architecture team aware of the changes in business requirements? Has the architecture team all necessary information related to the business?** (FGI 2006)
- **To what extent do the requirements cover the concerns of stakeholders? To what extent are the requirements of different stakeholders in balance** (FGI 2006)?

Communication and Common Language

Business Driven Approach

Assessment and Evaluation

IT Investment and Acquisition Strategies

Organizational Culture

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Evaluation Needs – Communication and Common Language

E.g.
- To what extent are the architectural concepts defined, documented, approved and used in communication?
- To what extent is the communication on architectures and architectural work established between different stakeholders?
- **To what extent are the architects/the architecture team capable of communicating with different stakeholders using the language these stakeholders can comprehend** (FGI 2006)?
- Has the communication been on such a level (granularity) that it satisfies the needs of the stakeholders (FGI 2006)?
- **To what extent has the architects/architecture team been capable of communicating the top management whether the business requirements can be implemented in the schedule set by the business** (FGI 2006)?

Communication and Common Language

Business Driven Approach

Assessment and Evaluation

IT Investment and Acquisition Strategies

Organizational Culture

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Evaluation Needs – Commitment
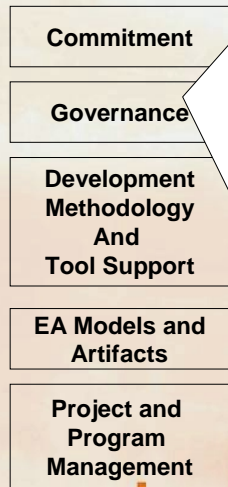
Commitment

Scoping and Purpose

Communication and Common

- **To what extent is the (top) management aware of the architecture approach of the organization** (FGI 2006)?
- To what extent is the (top) management aware of the objects and benefits of EA?
- To what extent is the (top) management committed to and involved in the architecture approach? **Does the management sponsor the EA approach** (FGI 2006)?
- **To what extent are the other stakeholders aware of the architecture approach of the organization** (FGI 2006)?
- To what extent are the other stakeholders committed to and involved in the architecture approach?
- To what extent do the various stakeholder groups participate in the architecture development?

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Evaluation Needs – Governance

Commitment

Governance

Development
Methodology
And
Tool Support

EA Models and
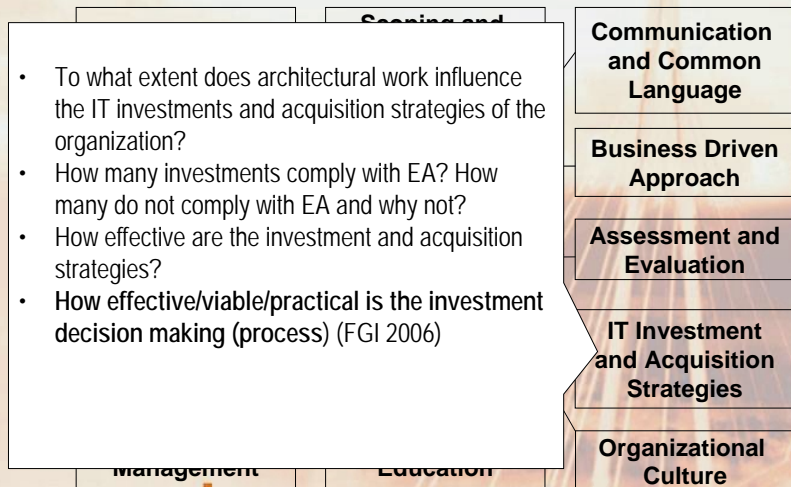Artifacts

Project and
Program
Management

E.g.
- Does the governance have the necessary **resources** (time, money, etc.) (FGI 2006)?
- How is the architecture work/governance **positioned** in the organization (e.g. in the information system management/CIO or elsewhere in the organization chart)? How successful has this solution been? Is there any need to reposition the architecture work/governance? (FGI 2006)
- How effective are the EA governance processes, structures and practices? How helpful are they considered e.g. by the projects (FGI 2006)?
- To what extent do the governance processes provide **feedback** to the strategic or business planning processes (FGI 2006)?
- To what extent is the EA governance process integrated into other business management processes (FGI 2006)?

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Evaluation Needs – IT Investment and Acquisition Strategies

Scoping and

Communication
and Common
Language

Business Driven
Approach

Assessment and
Evaluation

IT Investment
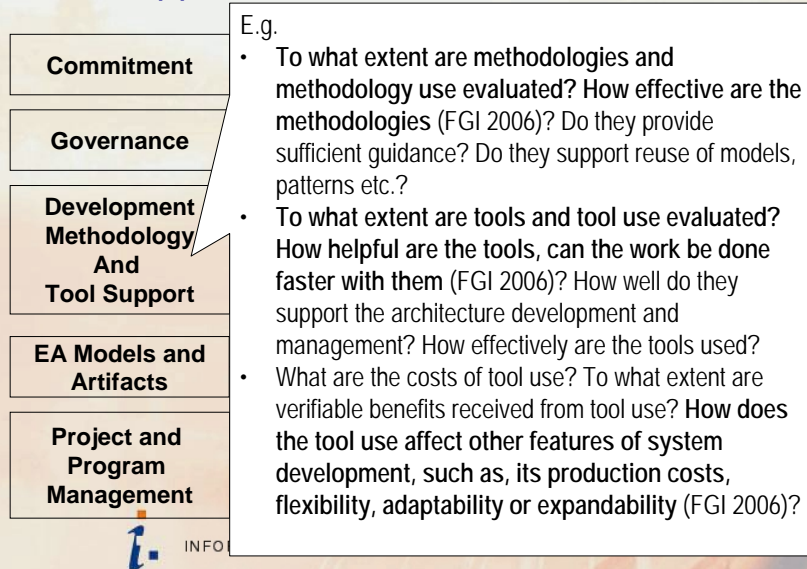and Acquisition
Strategies

Organizational
Culture

- To what extent does architectural work influence the IT investments and acquisition strategies of the organization?
- How many investments comply with EA? How many do not comply with EA and why not?
- How effective are the investment and acquisition strategies?
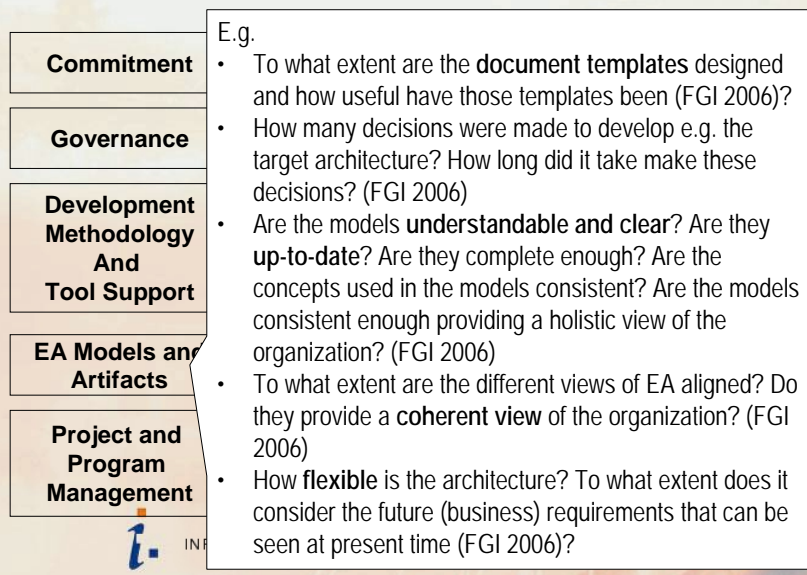- How effective/viable/practical is the investment decision making (process) (FGI 2006)

Management   Education

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Evaluation Needs – Development Methodology and Tool Support

Commitment
Governance
Development Methodology And Tool Support
EA Models and Artifacts
Project and Program Management

E.g.
- **To what extent are methodologies and methodology use evaluated? How effective are the methodologies** (FGI 2006)? Do they provide sufficient guidance? Do they support reuse of models, patterns etc.?
- **To what extent are tools and tool use evaluated? How helpful are the tools, can the work be done faster with them** (FGI 2006)? How well do they support the architecture development and management? How effectively are the tools used?
- What are the costs of tool use? To what extent are verifiable benefits received from tool use? **How does the tool use affect other features of system development, such as, its production costs, flexibility, adaptability or expandability** (FGI 2006)?

Evaluation Needs – EA Models and Artifacts

Commitment
Governance
Development Methodology And Tool Support
EA Models and Artifacts
Project and Program Management

E.g.
- To what extent are the **document templates** designed and how useful have those templates been (FGI 2006)?
- How many decisions were made to develop e.g. the target architecture? How long did it take make these decisions? (FGI 2006)
- Are the models **understandable and clear**? Are they **up-to-date**? Are they complete enough? Are the concepts used in the models consistent? Are the models consistent enough providing a holistic view of the organization? (FGI 2006)
- To what extent are the different views of EA aligned? Do they provide a **coherent view** of the organization? (FGI 2006)
- How **flexible** is the architecture? To what extent does it consider the future (business) requirements that can be seen at present time (FGI 2006)?

Evaluation Needs – Assessment and Evaluation

E.g.
- To what extent are the needs for architecture evaluation identified and approved? To what extent do these needs correspond to the maturity of the organization's EA as well as to the organization's policies (ways of working)? (FGI 2006)
- **To what extent are the evaluation criteria and metrics aligned with the other evaluation metrics used in the organization** (FGI 2006)?
- **To what extent are the evaluation points identified? What is the time-frame of evaluation** (FGI 2006)?
- What are the costs of evaluation? To what extent are verifiable benefits received from evaluation? (Cost-benefit analysis)
- Are evaluation techniques aligned with architecture maturity?

Communication and Common Language

Business Driven Approach

Assessment and Evaluation

IT Investment and Acquisition Strategies

Organizational Culture

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Evaluation Needs – Skilled Team, Training and Education

E.g.
- To what extent are the roles and responsibilities of the architecture team (architects) defined?
- **Does the team have the necessary resources (time, money, etc.)** (FGI 2006)?
- To what extent does the team has the necessary skills and knowledge needed in architectural work? How skillful and knowledgeable is the team? **To what extent does the team possess various skills and experience (in business, technology, system development, architecture, etc.)** (FGI 2006)?
- **How have the necessary skills been acquired; through training, hiring, partners, consultants etc. (FGI 2006)?**
- To what extent is training and education available for the architects, for the other stakeholders? Is the training provided internally/externally?

Project and Program Management

Skilled Team Training and Education

Organizational Culture

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Evaluation Needs – Organization Culture

E.g.
- To what extent is the architecture approach approved by the organization? How aware are the organization members of the architecture approach and its objectives (FGI 2006)? How is the EA perceived by the organization (members)?
- To what extent are the cultural challenges or constraints for architectural work been identified?
- To what extent are the challenges or constraints responded to?
- **How has EA affected the organization, its structure and culture, after integrating or consolidating e.g. some of the financial and personnel management functions** (FGI 2006)?
- **How long time has is taken to make the required changes in the organization? Has it taken longer or shorter time than earlier?** (FGI 2006)

Project and Program Management

Skilled Team, Training and Education

Organizational Culture

Evaluation Needs – Project and Program Management

E.g.
- To what extent is the coordination between architecture development or implementation projects organized?
- **To what extent does the project methodology emphasize the importance of architecture? To what extent does the project methodology include architecture guidance** (FGI 2006)?
- **To what extent has a project gained architecture guidance? How useful has the guidance been?** (FGI 2006)
- **How many projects have had difficulties in following the guiding principles or architectural constraints? How many projects have indicated a need to change or refine the architecture (plans, objectives etc.)?** (FGI 2006)

and Acquisition Strategies

Project and Program Management

Skilled Team, Training and Education

Organizational Culture

Evaluation Needs – Entire EA Program

E.g.
- To what extent does EA meet the key stakeholders' concerns (i.e. captures the right information)?
- **What are the benefits of the EA approach to each stakeholder group** (FGI 2006)?
- To what extent are the EA and business objectives and benefits met? If objectives are not met, why not, and how to assure that the same mistakes are not done again (FGI 2006)?
- **What kind of business impacts does EA provide? How have these impacts evolved/changed over time (quarter, year, 2-3 years, etc.)?** (FGI 2006)
- To what extent does EA provide the 'big picture' of the organization and assist business operations effectively in a situation where e.g. the market share is increasing, and the profitability is high (i.e. in a situation, where no radical changes are not necessary) (FGI 2006)?
- How effective/viable/practical is the decision making (process) (FGI 2006)
- **How has EA affected the IT costs? Have they been decreasing or increasing?** (FGI 2006)
- **What kind of support does EA provide for the business processes development and management** (FGI 2006)?
- What is the business value of EA?
- What is the ROI/ROA of EA?
- **How mature is the organization's EA (program)? How has the maturity evolved over time (quarter, year, 2-3 years etc.)?** (FGI 2006)

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Quality Attributes for EA?

EA Objectives/ Goals

Quality Attributes

Data
Tec

Evaluati

- Which characteristics of the targets are to be evaluated? How to describe the targets to be evaluated?
  → Evaluation criteria / quality attributes
- Attributes/criteria were not scrutinized yet, but a list of possible attributes was generated (see the Appendix 3 in the report)
- Examples:
  - Functionality
  - Usability
  - Security
  - Compliance
  - Interoperability
  - Efficiency
  - Visibility
  - Maintainability
  - Flexibility

Conclusions

- Evaluation planning starts with the definition of e.g. evaluation purposes, audiences, evaluation targets, and quality attributes
    - Examples of these were presented to stimulate intra-organizational discussion
    - These components are interconnected; architecture evaluation targets depend at least on the objectives of the architectural work, evaluation purposes and the audience
    - Also the organization's EA maturity affects the selection of evaluation targets
    - → compatibility is required between the components and the maturity level
    - CSFs for EA provide a starting point for defining architecture evaluation targets
- Evaluation targets and metrics need to be compatible with the other measurement systems used in the organization (e.g. BSC)

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