Enterprise Architecture – Introduction

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Learning Objective of the Module

- Topic: Management and Modeling of Enterprise Architecture
  - Alignment of Business and IT
  - Supporting business goals with Information Systems
- We do this because architecture is necessary to deal with **complexity** and **change**
- Learning Objective
  - understand the interaction of corporate strategies, business processes and information systems.
  - understand the role of enterprise architectures for the alignment of business and IT
  - Implement enterprise architecture modeling and management

CHAPTER 1: BUSINESS-IT ALIGNMENT AND AGILITY

Learning Objective of Chapter 1

- Topic: Alignment of Business and IT
  - Strategic and operative Planning of IT
  - The need of Enterprise Architecture for
- This is necessary because
  - Enterprise need tobe **agile** in order to react on changes in business environment and technology
  - To change **complex** systems like enterprises you need a description or a model
- Learning Objective
  - Mutual dependencies between business and IT
  - understand the role of Enterprise Architecture in business transformation and Strategic IT alignment

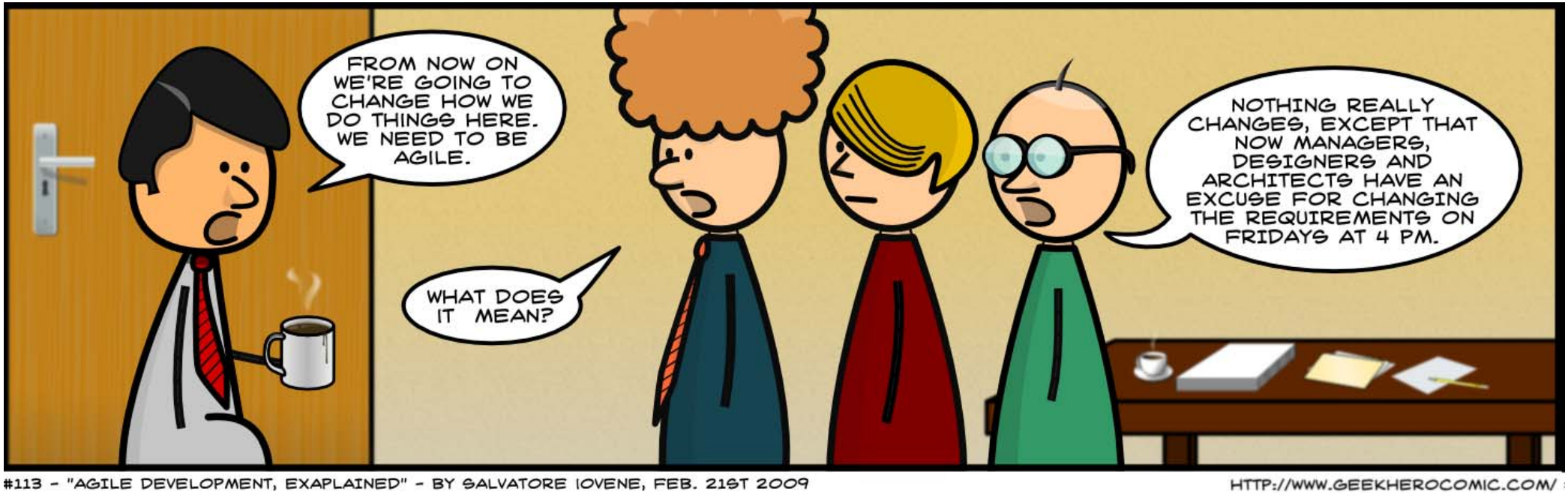
Strategic Planning of Information Technology

The objective of planning IT strategically is to **align** it with overarching corporate goals and business requirements and make it **agile** enough to deal with constant change in the company and its environment

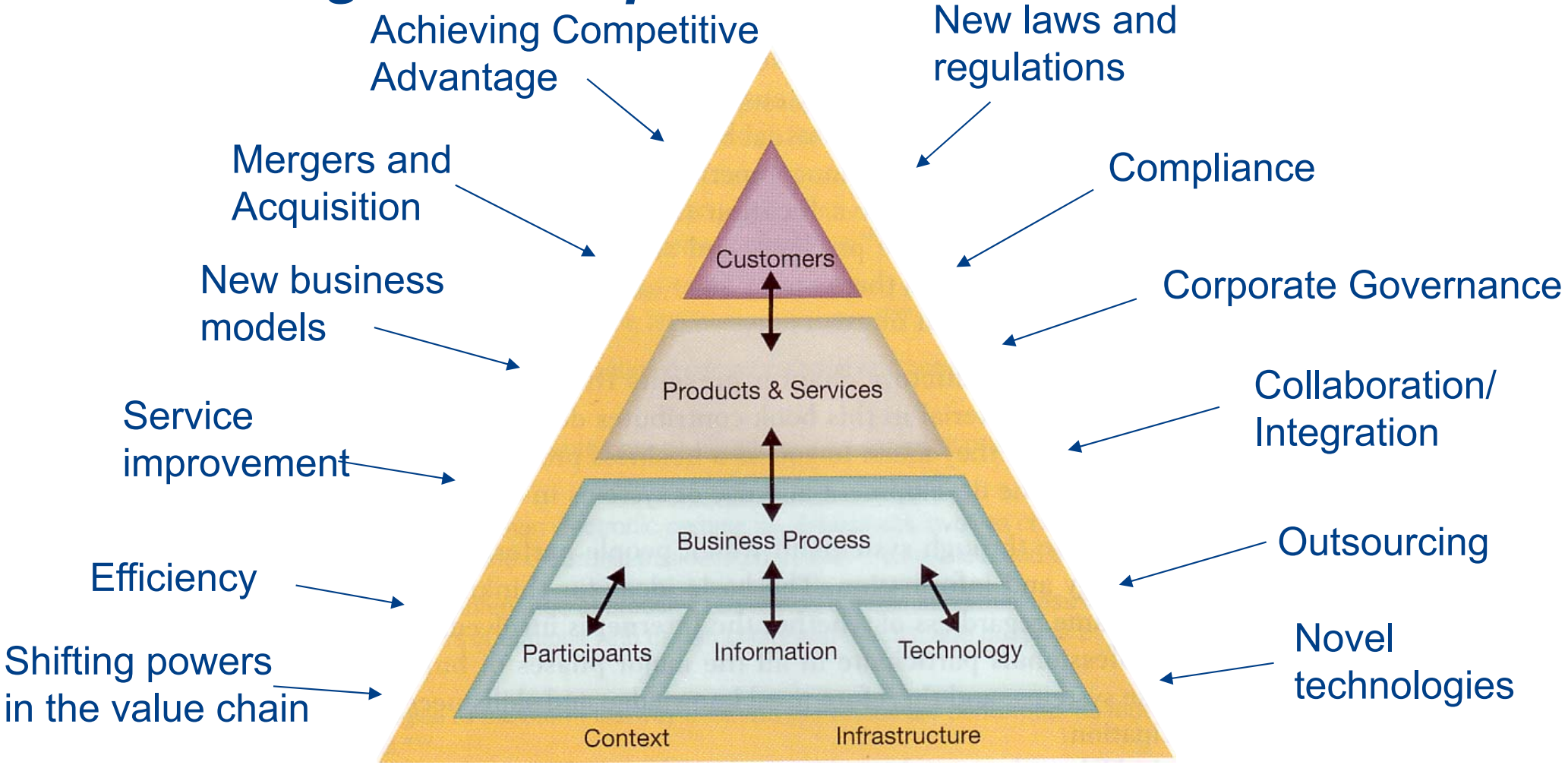
(Hanschke 2010, p. 7)

- **Agility – Ability to change**
- **Business-IT alignment**

Demand for Agility



Increasingly dynamic environment: Challenges confronting an Enterprise



Challenge: Agility

- To improve their chances of survival, enterprises need to be agile.
- Agility is the ability of enterprises to
  - quickly **adapt themselves to changes** in their environment and
  - **seize opportunities** as they avail themselves
- We can distinguish between at least two kind of agility
  - **Run-time agility**: Being agile in the way we do business
  - **Change**: Making changes in how business is conducted

Source: Op 't Land, M.; Proper, E.; Waage, M.; Cloo, J. and Steghuis, C.: Enterprise Architecture - Creating Value by Informed Governance, Springer-Verlag 2009, page 6. http://www.springerlink.com/content/k8jp3r/#section=132347&page=2&locus=10

Run-time Agility: Being agile in the way we do business

- Dealing with individual customer requirements, reducing response time to external demands, and reacting on events
- Examples:
  - **Knowledge Work:** non-routine, judgement-oriented work reliant on expertise, e.g. consulting, IT development, medical treatment
  - **Mass customization**: mass production of individually customized goods and services, e.g. car industry and IT industry (PCs)
  - **Reduce time to market** has become a business requirement in many lines of business, e.g.
    - car industry (new model within few months instead of 6 years)
    - banking industry (time to market for a new product in few weeks instead of 9-12 months) [1)]

Adaptive Case Management is a method to deal with this kind of agility. It is a topic in the module Business Process Management

1) Op 't Land, M.; Proper, E.; Waage, M.; Cloo, J. and Steghuis, C.: Enterprise Architecture - Creating Value by Informed Governance, Springer-Verlag 2009, page 6, http://www.springerlink.com/content/k8ip3r/#section=132347&page=2&locus=10

Change on the Strategic Level: Business Transformation

- Business transformation is a key executive management initiative that attempts to align People, Process and Technology initiatives of an organisation more closely with its business strategy and vision to support and help innovate new business strategies and meet long term objectives
- Business transformation is achieved by realigning
  - the way staff work (processes),
  - how the organisation is structured (people)
  - how technology is used

Changes on the Operational Level

- Not all changes occur on strategic level.
- Examples of changes on the operational level:
  - Optimization of a business process
  - Replacement of an IT application
  - Update of an IT application
  - Re-organisation of a business unit
  - Outsourcing of a business process
  - Outsourcing of IT applications to a cloud provider
  - Implementation of a new information system
  - Introducing a new collaboration platform
  - ...

Drivers for Agility can be internal and external

- Internal Drivers
  - Business Process Optimisation
  - Reorganisation
  - Migration of Information Systems
  - Changes in IT infrastructure

Exploit **Strengths**
Eliminate **Weaknesses**

- External Drivers
  - Market Opportunities, new business models
  - New regulations
  - Demand for new services and products
  - Innovations

Seize **Opportunities**
React on **Threats**

Alignment of Business and Information Technology (IT) – Strategic Level

- The alignment of business and IT is an issue on both strategic and operational level
- Business transformation is an initiative on the strategic level which requires the alignment of business and IT.
- On strategic level the alignment of business and IT has to deal with problems like the following:
  - What happens to IT if the company has to react on market requirements?
  - What IT innovations are needed to remain competitive?
  - How do changes in the IT affect the business?

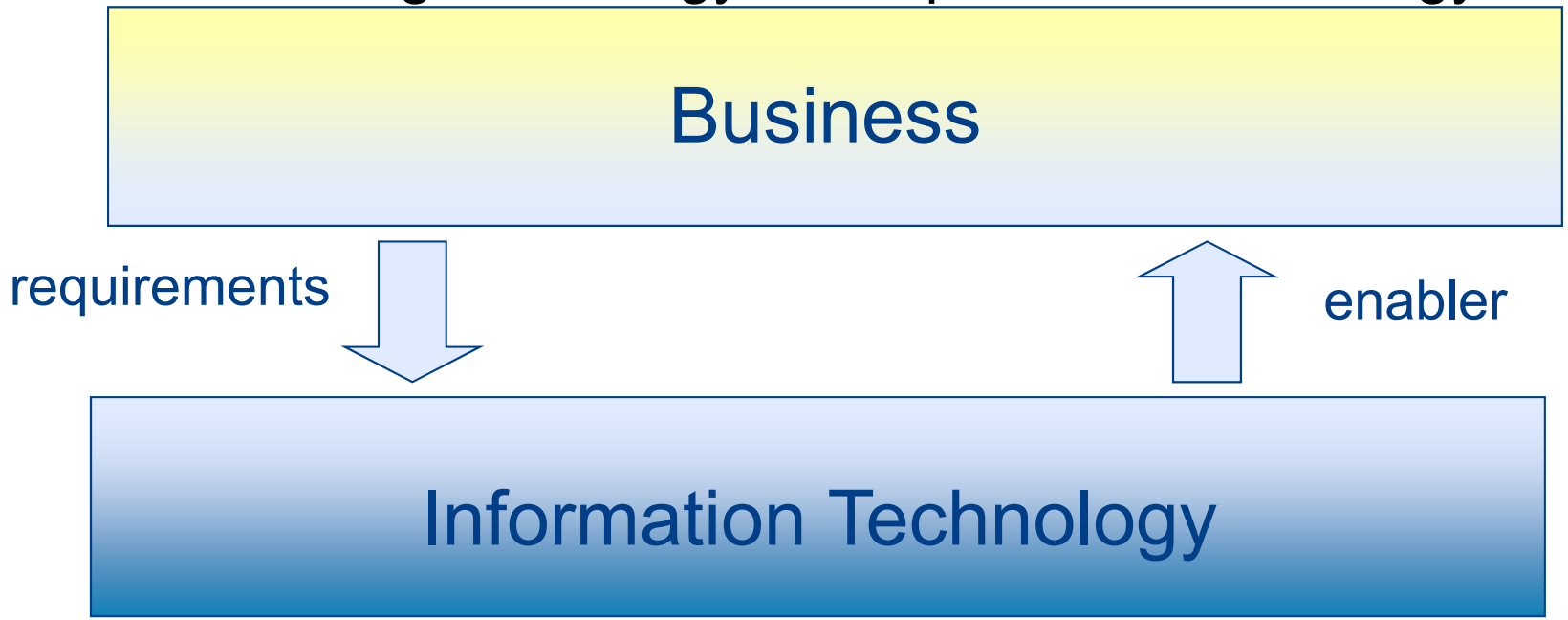
Alignment of Business and Information Technology (IT) – Operational Level

- Almost all processes have become IT reliant, if not fully automated.
- Thus, on the operational level, there is a mutual influence between information systems and the design of business process
  - A (re-)design of a business process often demands changes in the IT
  - Changes in IT applications and information systems can demand a re-design of business processes

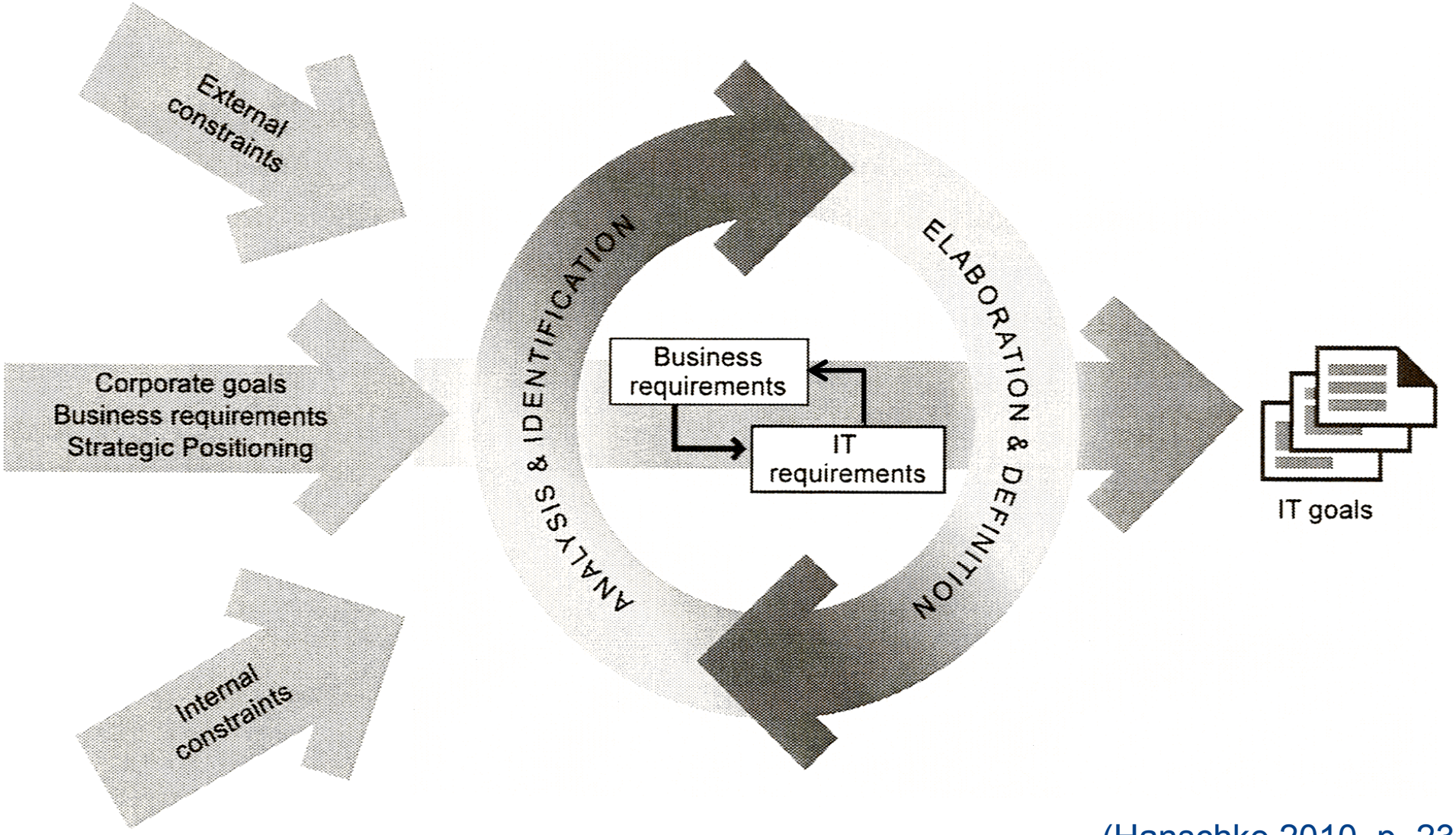
"There are no IT projects, only business projects."
(Paul Coby, CIO of British Airways)

Alignment of Business and IT

- There are mutual dependencies between business and IT
- The alignment of business and IT has to create an environment in which the IT department and the CIO
  - are not merely installing technology to support business processes but
  - are also using technology to shape business strategy.

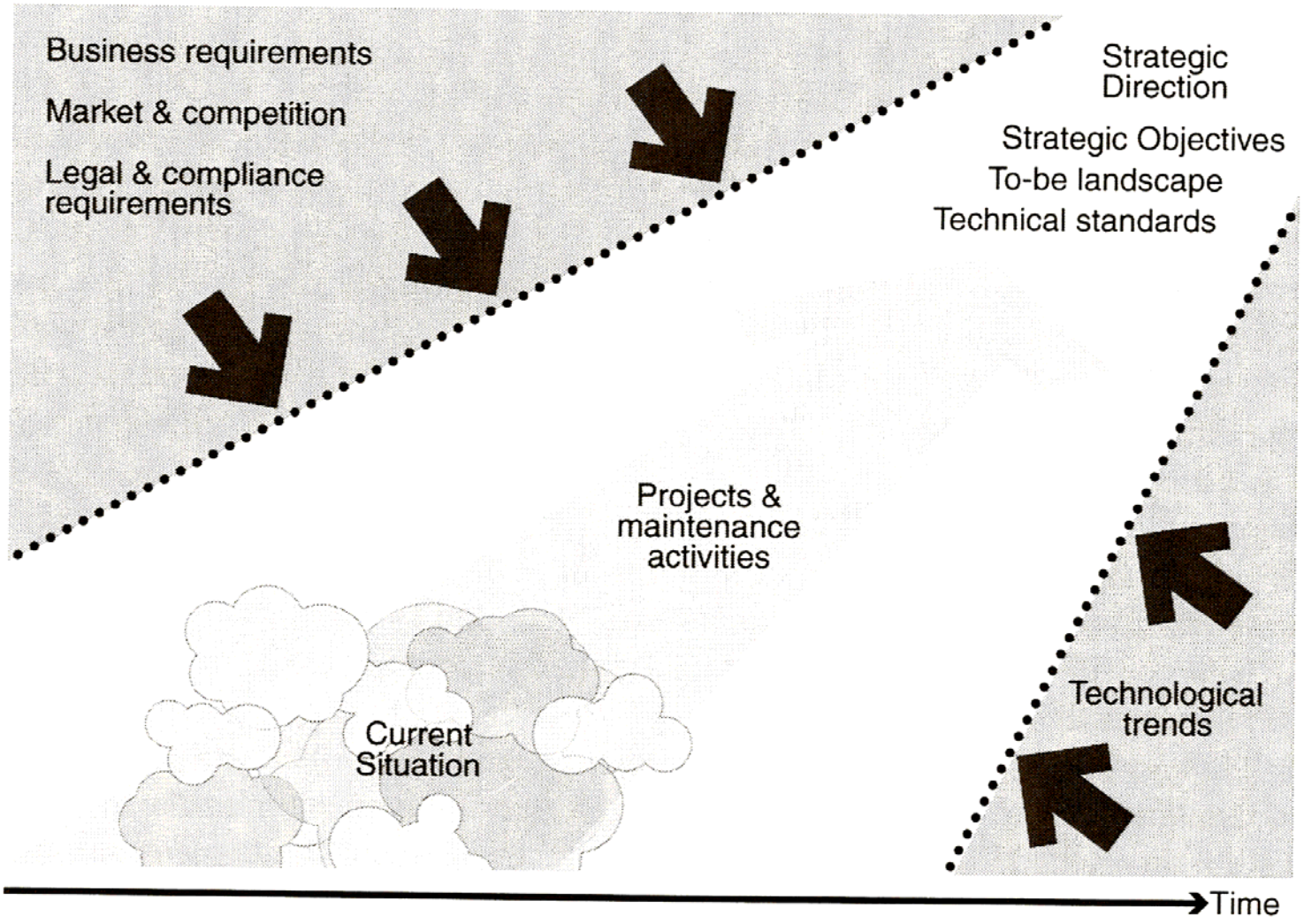


Deriving IT Goals



(Hanschke 2010, p. 23)

Strategic Alignment of IT



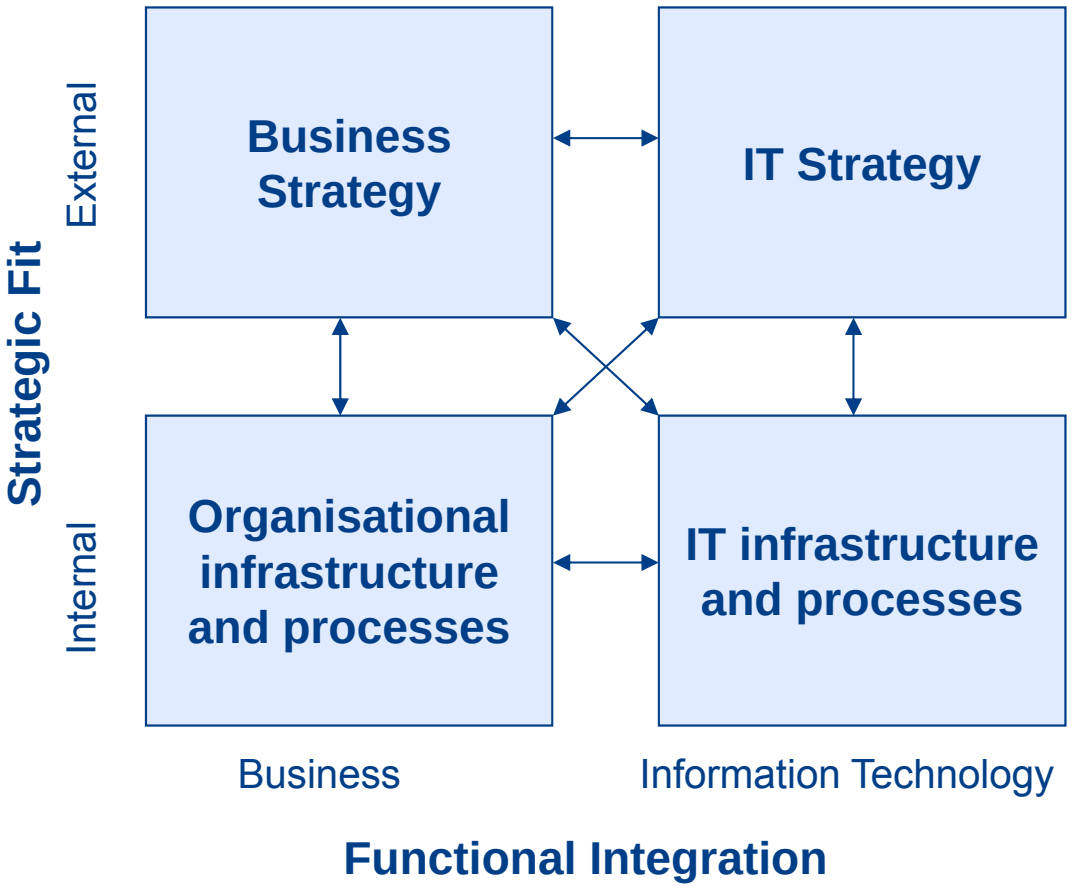
- Change projects transform a current situation (as-is) into a future situation (to-be)
- The change has to align business and IT.

(Hanschke 2010, p. 11)

Examples of Conflicts between Business and IT

- Alignment of business and IT is usually a compromise between business requirements and IT potentials
- Some examples:
  - Business requirements cannot be fully satisfied, because
    - there are *already systems available* that cannot be replaced (reasons can be costs or other dependencies)
    - standards set by IT strategy avoid unmanagable varieties and ensure reliability
    - centralisation reduces costs at the expense of specialisation
  - Chances of IT innovations cannot be implemented, because of
    - missing skills of employees
    - business processes or organisation are not appropriate
    - incompatibility with business strategy

Strategic Alignment Model



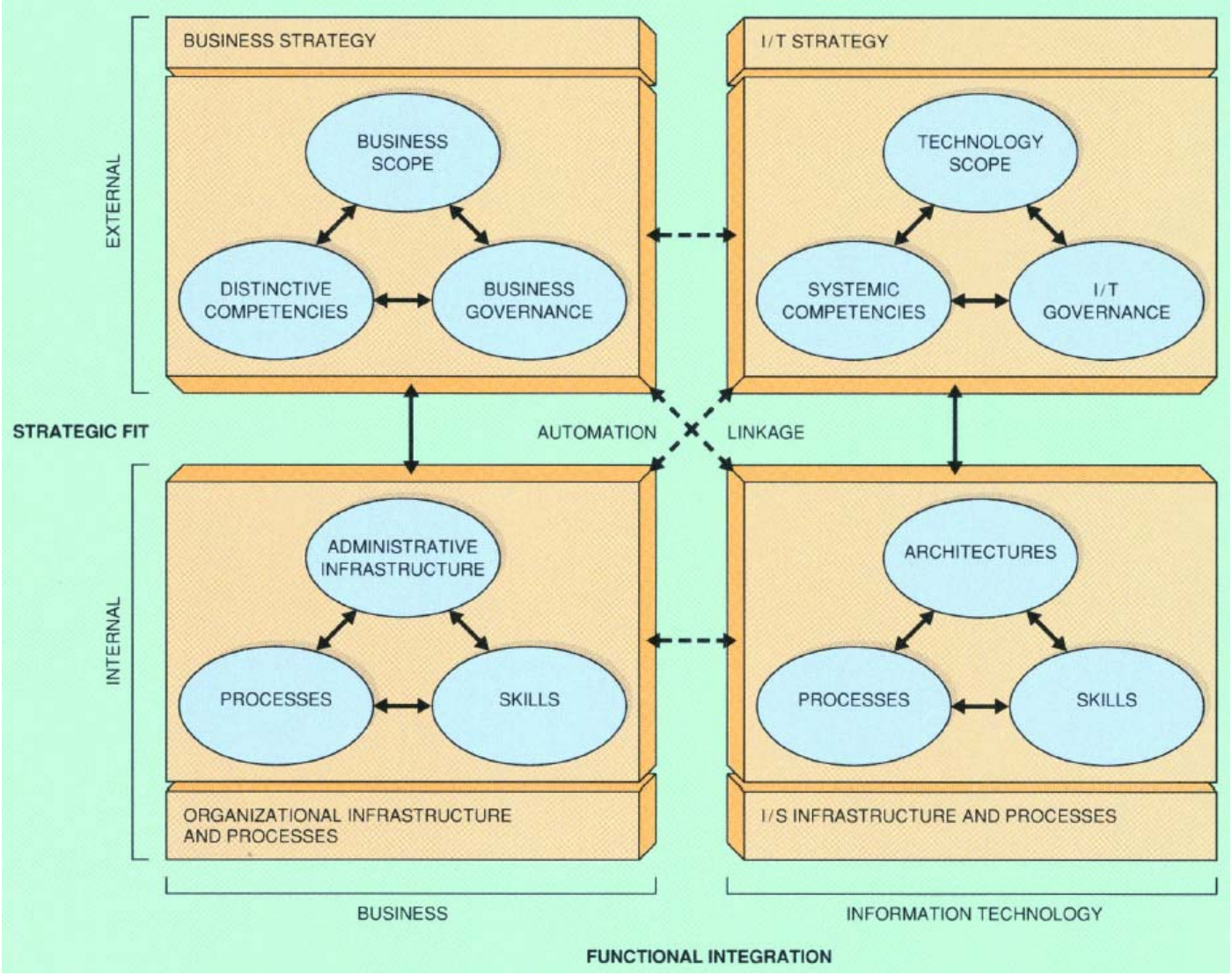
- The strategic alignment model of Henderson and Venkatraman (1993) combines the two dimensions
  - Aligning business and IT (functional integration)
  - Aligning interal and external drivers (strategic fit)
- Two principle approaches for alignment:

  business-driven: take the business strategy as the starting point and derive the IT infrastructure

  IT driven: focus on IT as an enabler; start from IT strategy deriving organisational infrastructure

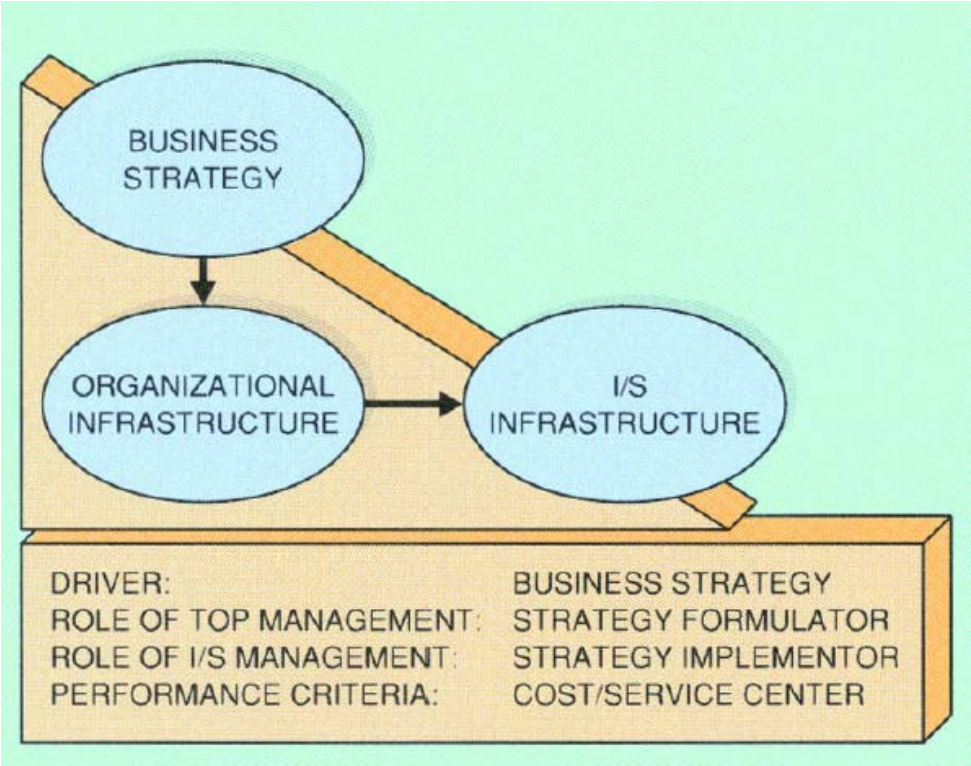
(Henderson & Venkatraman 1993)

Strategic Alignment Model – Detailed View

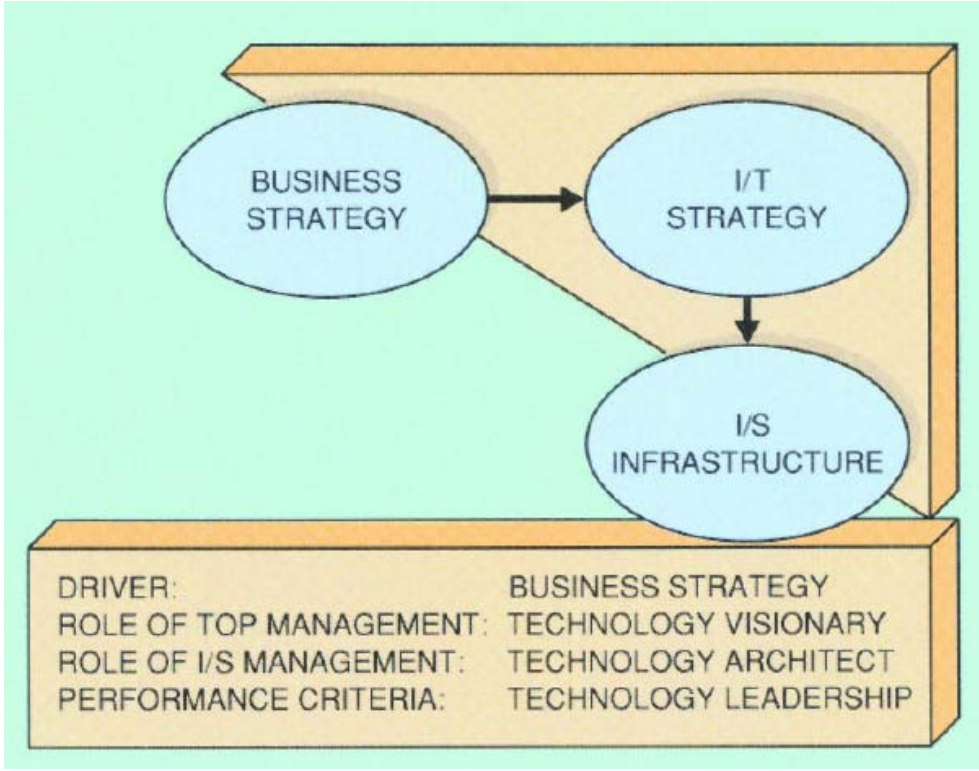


(Henderson & Venkatraman 1993)

Four Dominant Alignment Perspectives: I) Business Strategy as the Driver



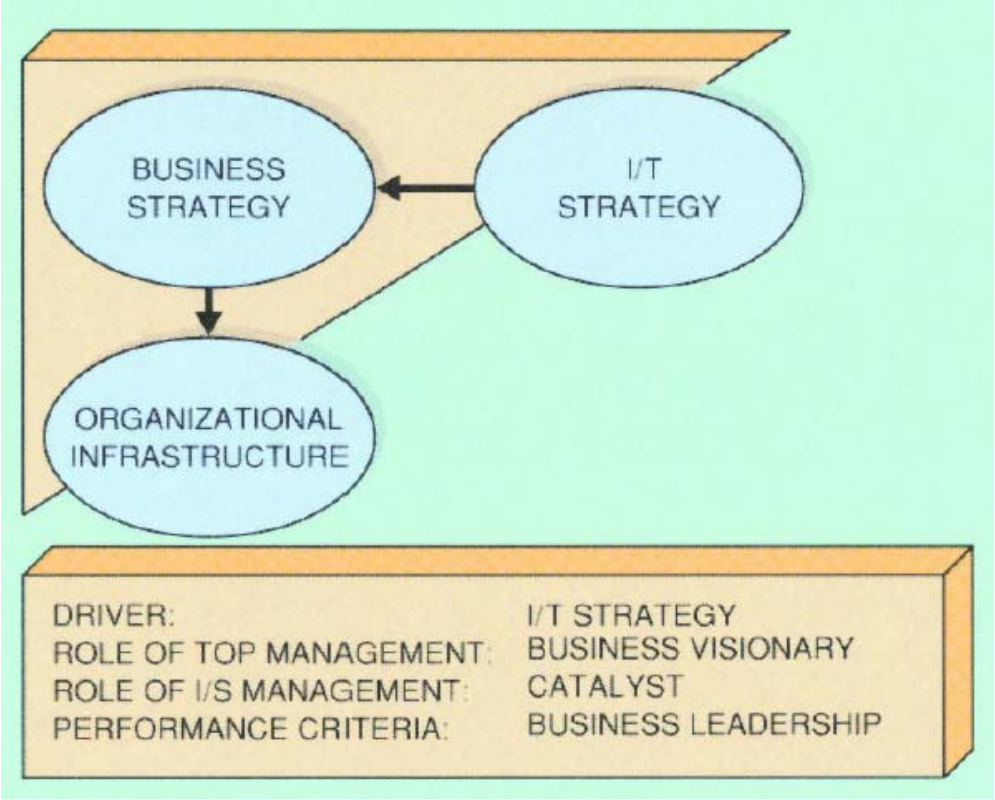
Strategy Execution Alignment



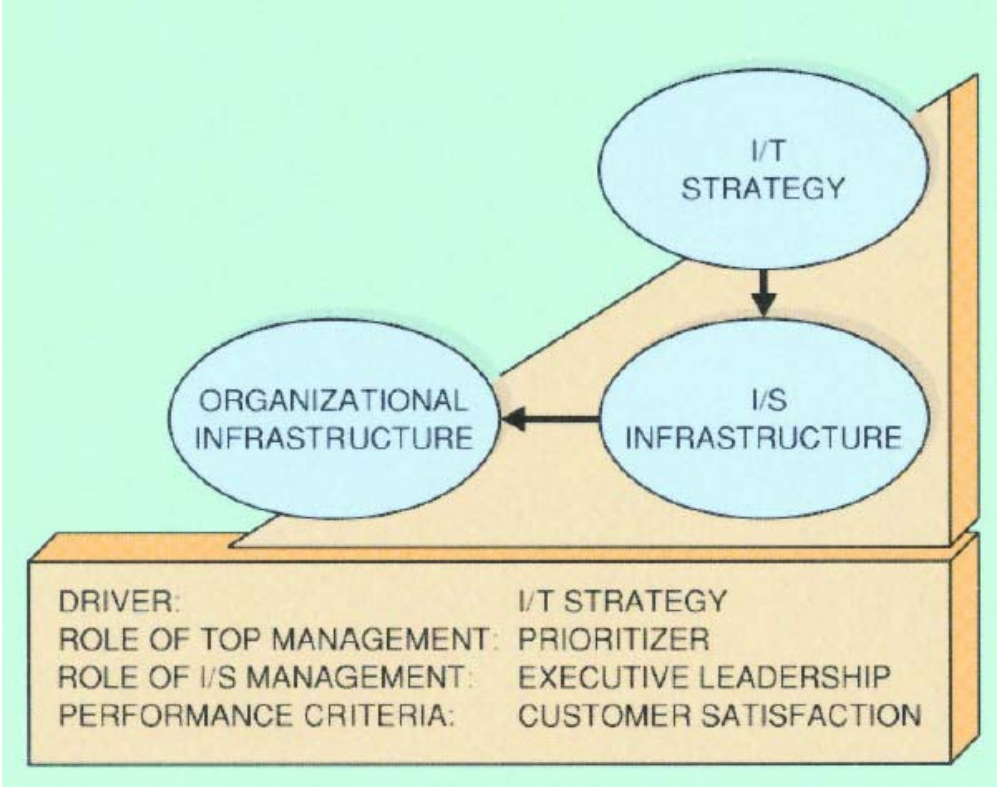
Technology Transformation Alignment

(Henderson & Venkatraman 1993)

Four Dominant Alignment Perspectives: II) IT Strategy as the Driver



Competitive Potential Alignment



Service Level Alignment

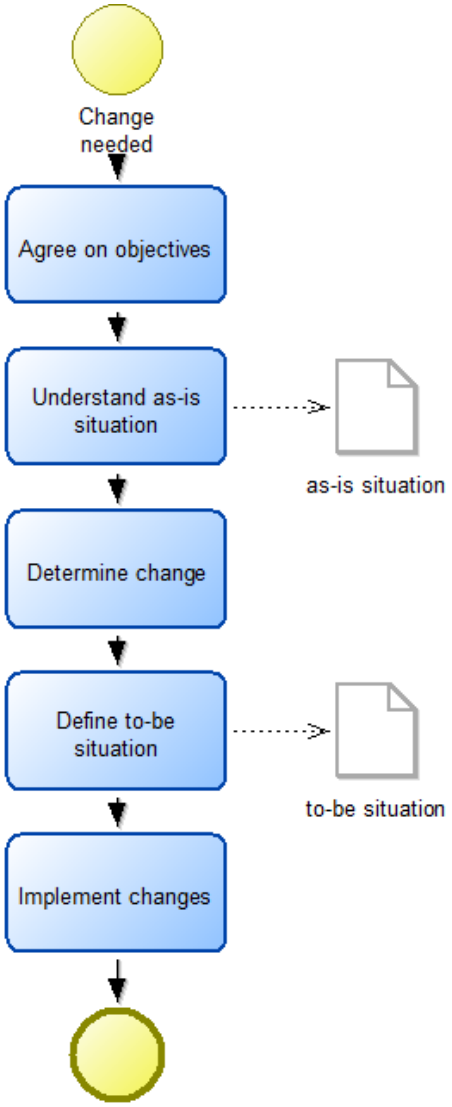
(Henderson & Venkatraman 1993)

Architecture: Dealing with Complexity and Change

- If the object (process, IT application, information system) you want to create or change is simple, and it is not likely to change, then you can do it directly.
- On the other hand, if the object is **complex**, you can't see it in its entirety at one time and it is likely to **change** considerably over time, you need a description or model.
- This description is what we call an "**Architecture**".

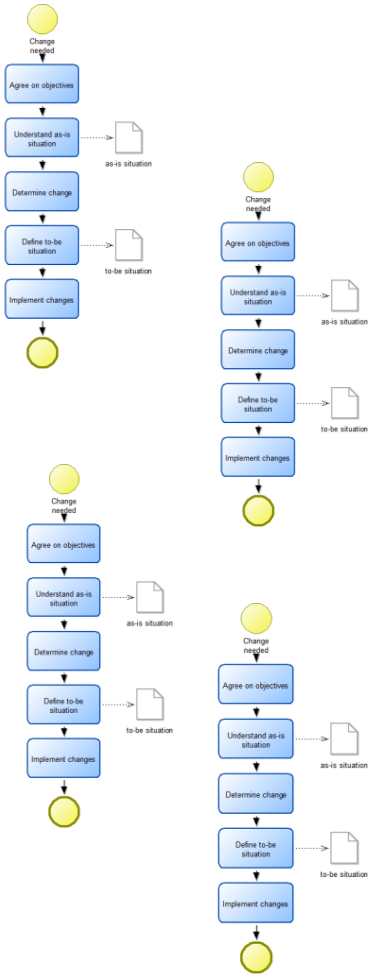
(John Zachmann, 2012)

Typical (Change) Projects



- Typically organisations go through several stages in a change project:
  - recognising the need to change
  - agreeing on the objectives of the change and a vision that describes a better future
  - understanding what the organisation is changing from (as-is model)
  - determine what needs to change
  - designing the new way of working and its support and management (→ to be model)
  - testing and implementing changes

Architecture Descriptions in an Enterprise



Typically …

… there are a large number of projects

- running concurrently or
- building on the result of previous projects

… projects have an extensive documentation of their (intended) result

… each project manages its own documentation which is not available for other projects

… there is a lack of coordination between projects

Problems for Agility in Today's Enterprises

In practice, enterprises see themselves hampered in their ability to change in several ways, which is a consequence of uncoordinated projects:

- being uninformed about their own products, services, capabilities, internal structures
- traditionally, organisations were designed with efficiency and effectiveness in mind rather than agility
- no common understanding and governance of key data resources
- a plethora of legacy applications and infrastructures
- duplicated functionality in terms of people and/or technology
- interwoven and unclear responsibilities
- organisational silos, self-contained business units who operate on their own, with no sharing of data
- silo applications, i.e. self-contained and isolated applciations, which only provide functionality to a specific business process

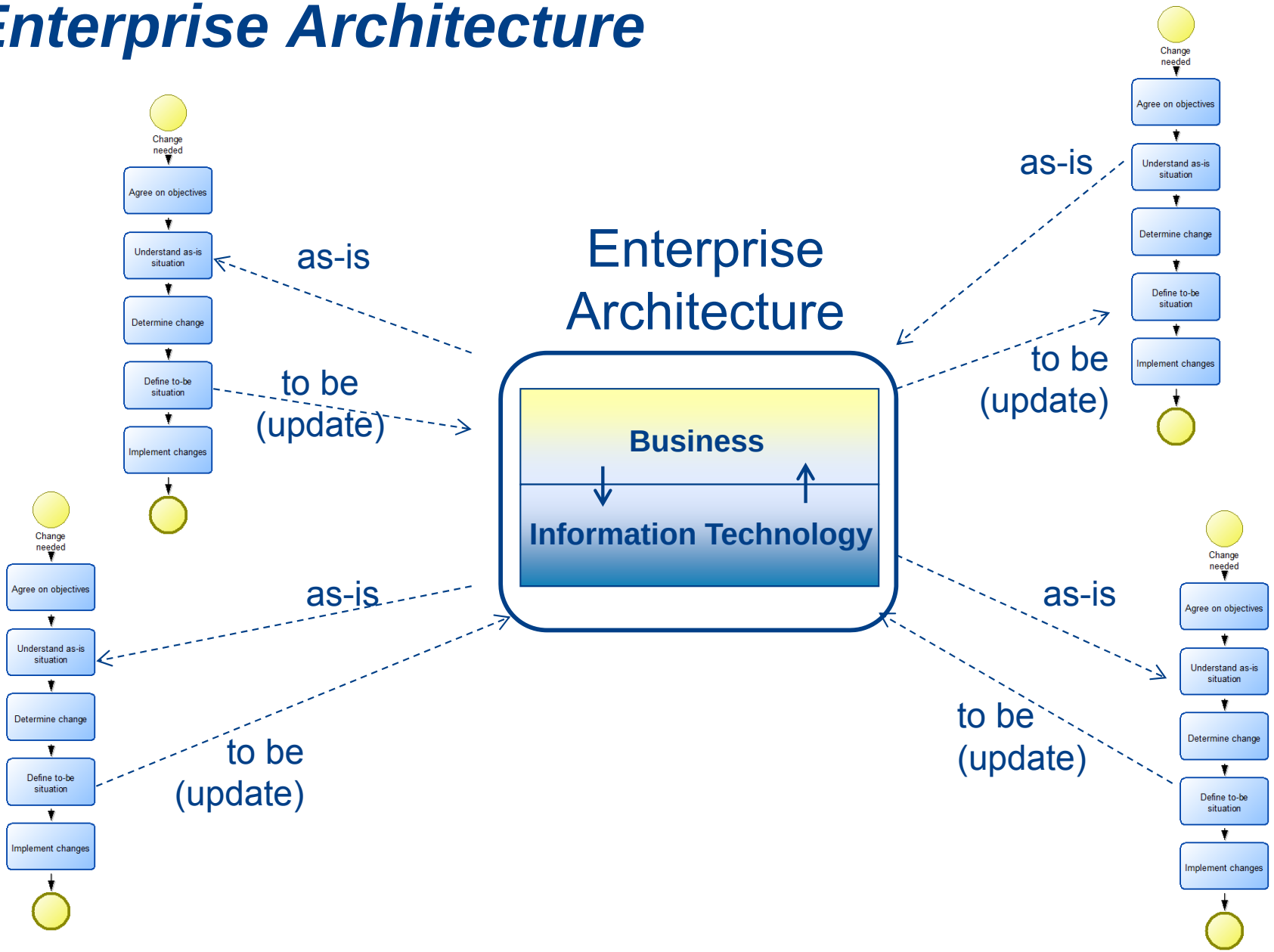
Source: Op 't Land, M.; Proper, E.; Waage, M.; Cloo, J. and Steghuis, C.: Enterprise Architecture - Creating Value by Informed Governance, Springer-Verlag 2009, page 6. http://www.springerlink.com/content/k8jp3r/#section=132347&page=2&locus=10

The Need for Architecture

- **Complexity:** If you can't describe it, you can't create it (whatever "it" is).
- **Change:** If you don't retain the descriptive representations after you create them (or if you never created them in the first place) and you need to change the resultant implementation, you have only three options:
  - Change the instance and see what happens. (High risk!)
  - Recreate ("reverse engineer") the architectural representations from the existing ("as is") implementation.
    (Typical for many projects - Takes time and costs money!)
  - Scrap the whole thing and start over again.

(John Zachmann, 2012)

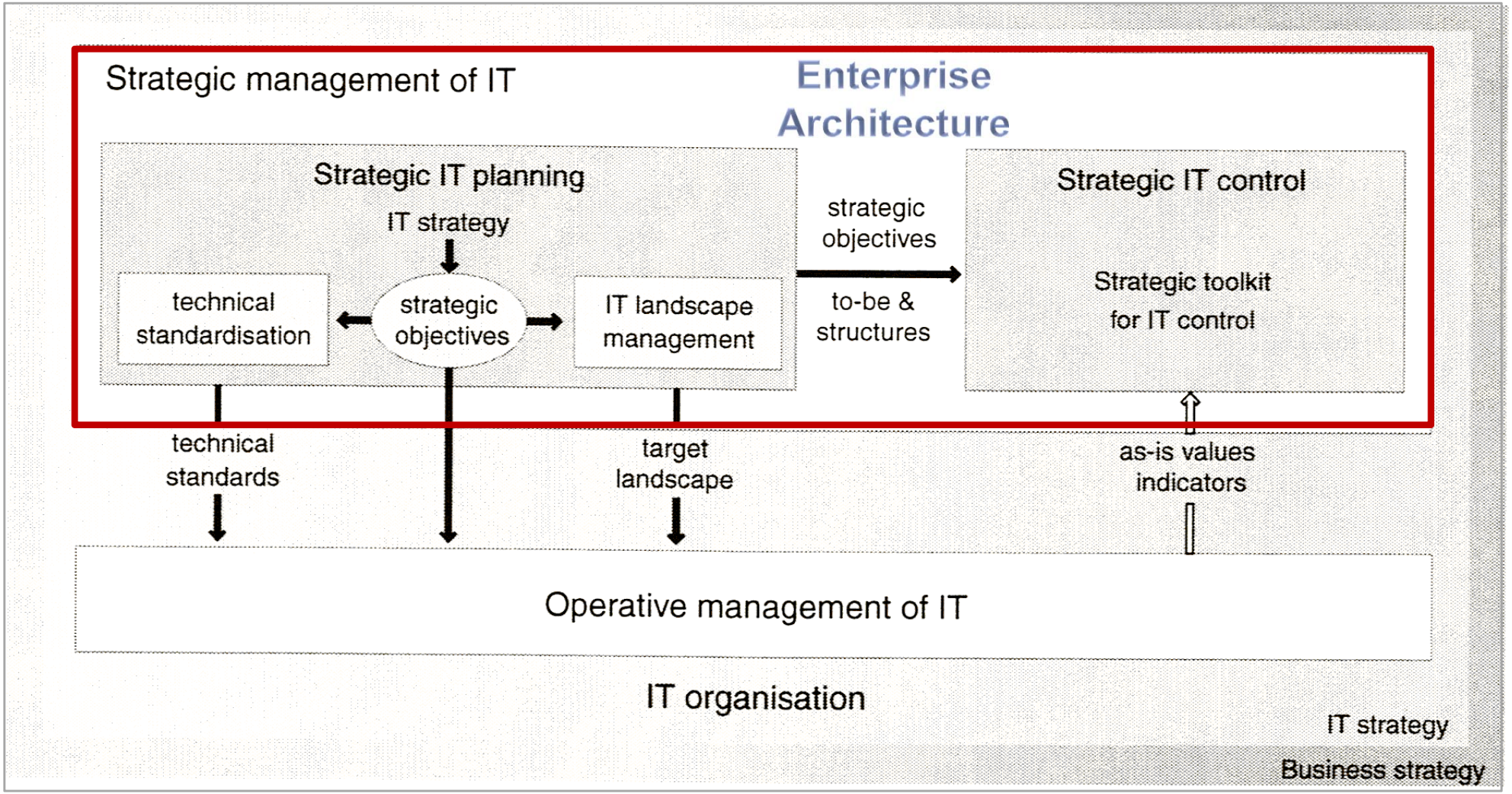
Enterprise Architecture



Enterprise Architecture

- **An Enterprise Architecture** is a coherent whole of principles, methods, and models that are used in the design and realisation of an enterprise's organisational structure, business processes, information systems, and infrastructure
- An Enterprise Architecture contains all *relevant*
  - Business structures
  - IT structures
  - and their relationships
- Enterprise Architecture gives an overall view on the enterprise
  - merge distributed information from various organisational entities and projects into a whole
  - show the interconnectedness and dependencies between these information
  - Show which information systems contribute to which business processes.

The role of Enterprise Architecture in IT Management



(Hanschke 2010, p. 3)

Enterprise Architecture Frameworks

- There are a number of Enterprise Architecture Frameworks
- The differ in
  - the structure of the content of the Architecture
  - the methodology how to management the architecture
- We can distinguish to main types of structures:
  - Matrix of aspects and perspectives (Zachman Framework)
  - Three layer architecture with business, applications and technology (e.g. TOGAF, ArchiMate, Best Practice)

The Zachman Framework for Enterprise Architecture – Enterprise Ontology

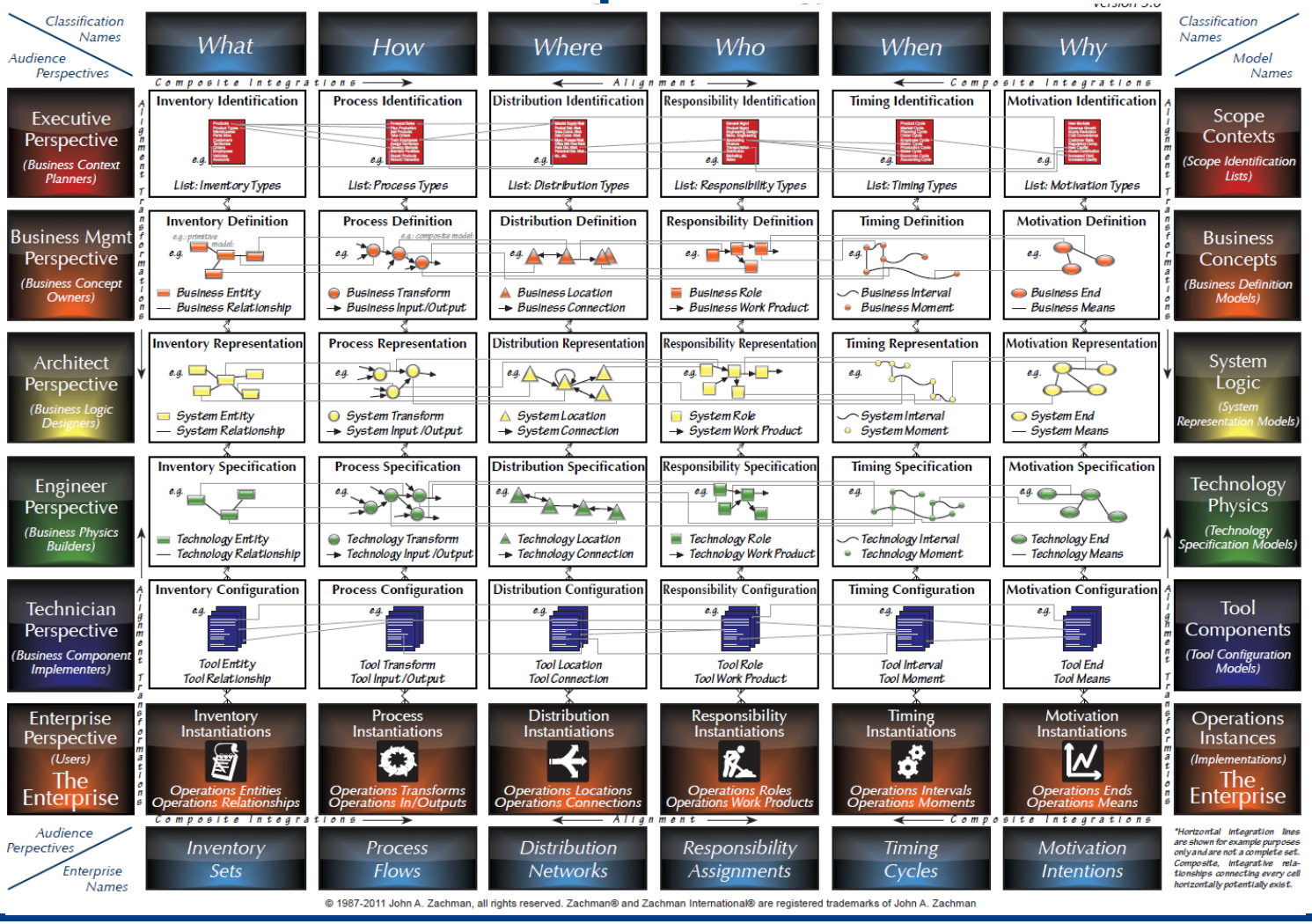
Each cell contains models

Aspects

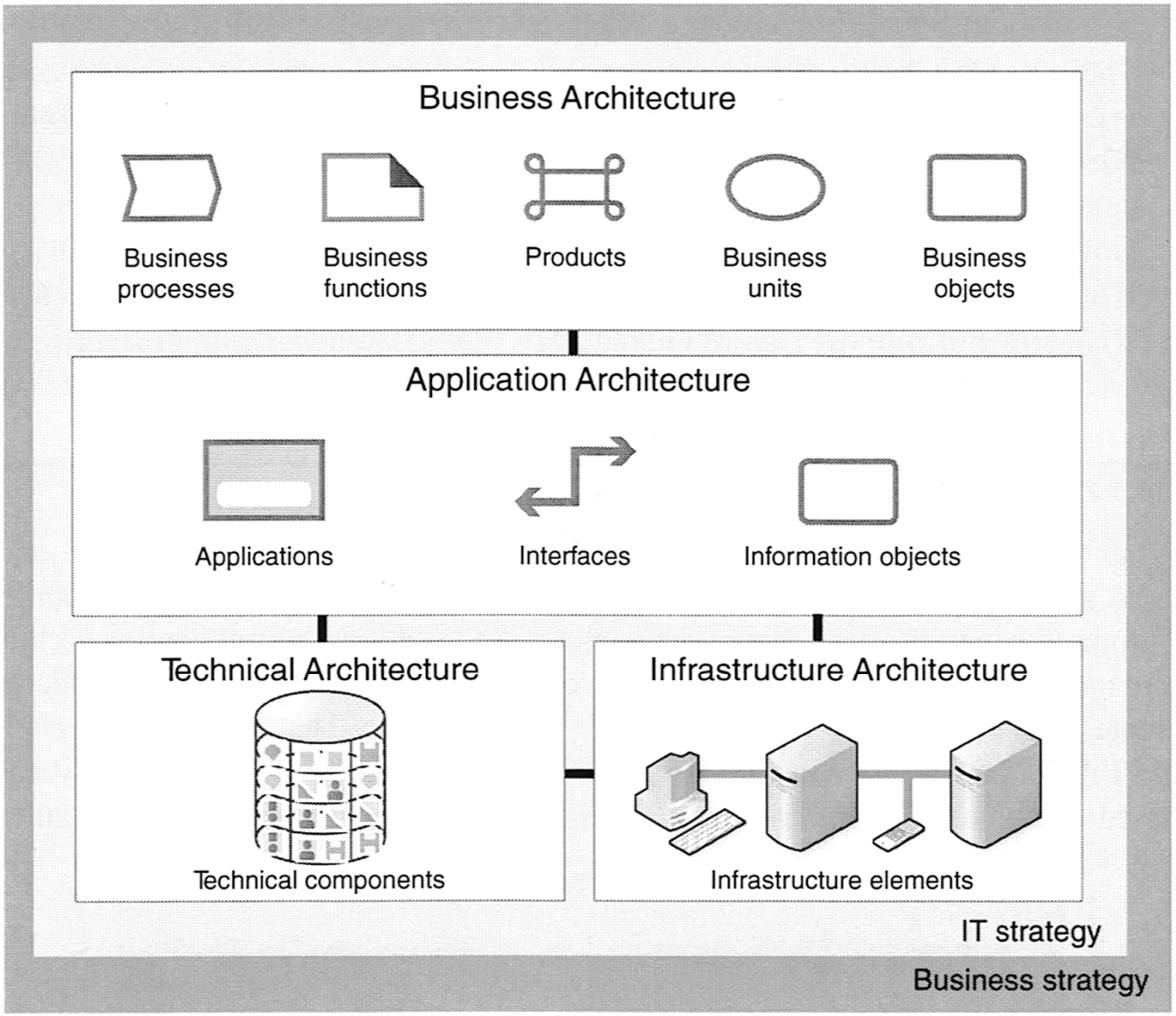
Perspectives

Business

Information Technology



Best Practice Enterprise Architecture



Objective of Enterprise Architecture

- Dealing with complexity and change
- Coherent common description of the enterprise for all projects instead of distributed project documentation
- Providing overview and avoiding the modeling of as-is situation over and over again.
- Ensuring alignment of business strategy and IT investments
- Describing the interaction between business and information technology
- Making dependencies and implications of changes in business and IT visible
- Supporting communication between different stakeholders by appropriate models