Information, Organization, and Management

Unit 4

Prof. Dr. Martin Hepp
http://www.heppnetz.de
mhepp@computer.org

http://www.heppnetz.de/teaching/img/

Textbook: Wigand/Picot/Reichwald: *Information, Organization and Management,* John Wiley & Sons, 1997

Models of Information and Communication

- There exists no single, uniform model
- Various models from various angles
  - intrapersonal understanding
  - behavioral options, restrictions, and problems
  - production of information / information as a good

cf. Wigand/Picot/Reichwald (1997)

Levels of Semiotics

- Semiotics: Scientific research of objects and functions of communication processes
- Three levels:
  - Syntactic: Analysis of signals and relationship between signals
  - Semantic: Analysis of signals and their meanings
  - Pragmatic: Analysis of signals and their effects
- Example

cf. Wigand/Picot/Reichwald (1997)

Syntactic Level

- Signals and relation between signals
- Formal rules determining the structure (e.g. grammars)
- Example: XML Schema Definition, Backus-Naur Form (BNF)

cf. Wigand/Picot/Reichwald (1997)

Semantic Level

- Relation between signals and meanings (designata)
- Message: requires semantic agreement
- Example: Ontologies are such semantic agreements

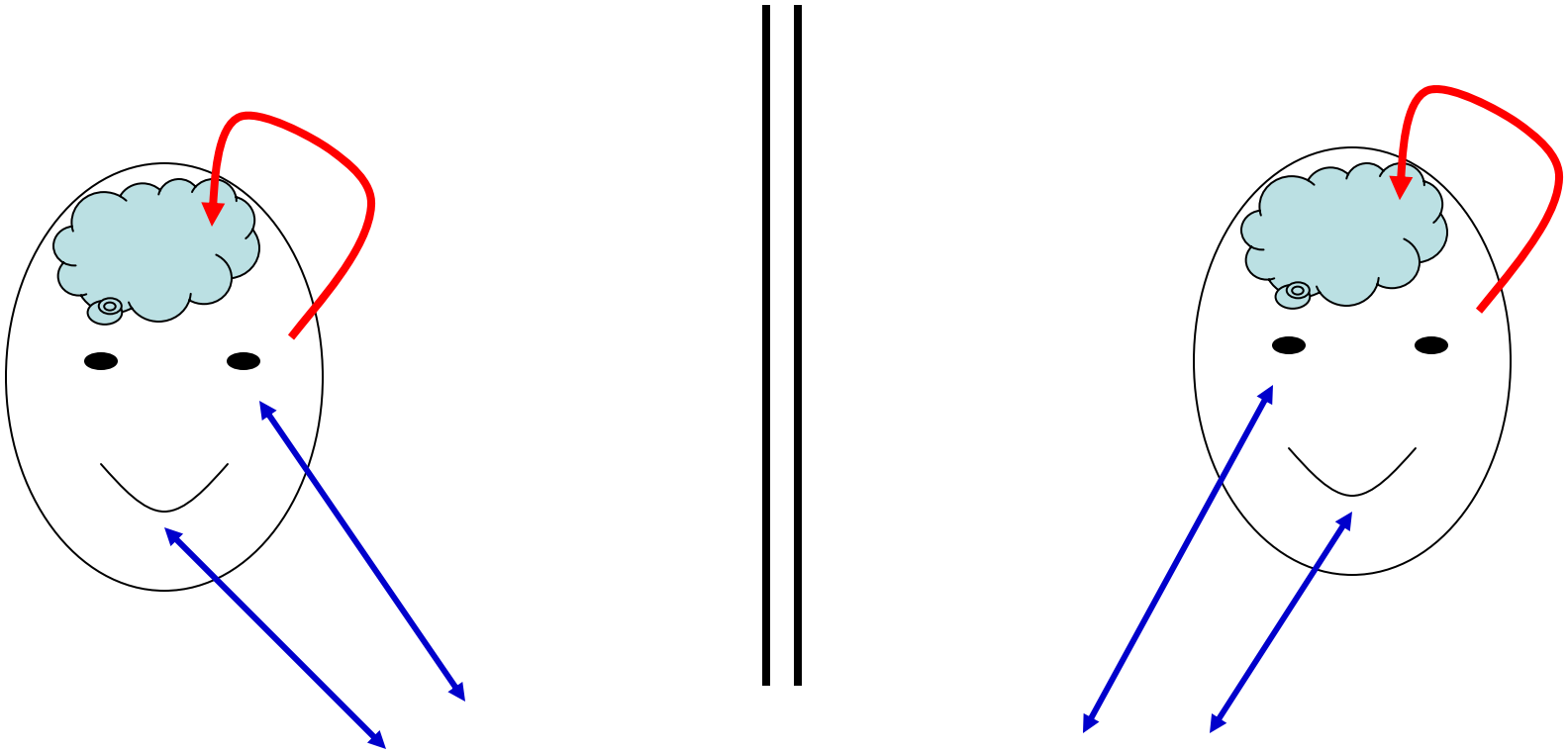
cf. Wigand/Picot/Reichwald (1997)

Pragmatic Level

- Relation between signs and their effects
- Intended and actual effects
- Example: Ordering a book by sending a message „1 pcs of ‚Information, Organization, and Management‘“

cf. Wigand/Picot/Reichwald (1997)

Radical Constructivsm



World: Phenomenons etc.

cf. Wigand/Picot/Reichwald (1997)

Models for Information Behavior

- Restricted Human Capabilities
- Rationality Restrictions

cf. Wigand/Picot/Reichwald (1997)

Context Variables (O‘Reilly)

- The likelihood that information is considered increases with
  - more power of the informing party
  - relevance for task completion (subjective/objective)
  - strong relationship with control and evaluation systems (e.g. peer-reviewed journal)
  - contribution to positively sanctioned actions
  - compliance with decion-maker‘s goals
  - little conflict with cooperation partners
  - degree of accessibility (online, good writing,...)
  - conciseness
  - degree of personal contact
  - degree of trust in the source

cf. Wigand/Picot/Reichwald (1997)

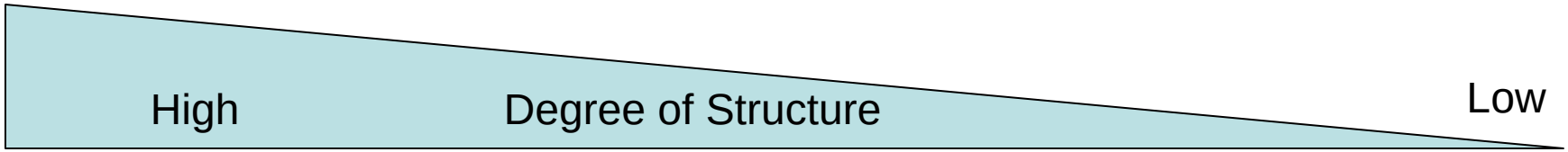
Information as Signal and Symbol

- Information behavior has signaling effects
- Information used mainly to refute expected criticism
- In particular, if consequences are to be carried by the decision-maker but not information costs
- Typical example: Business consulting

cf. Wigand/Picot/Reichwald (1997)

Communication Media and Purpose

Accuracy	Promptness & Convenience	Confidentiality	Complexity



Increasing importance of written and asynchronous media

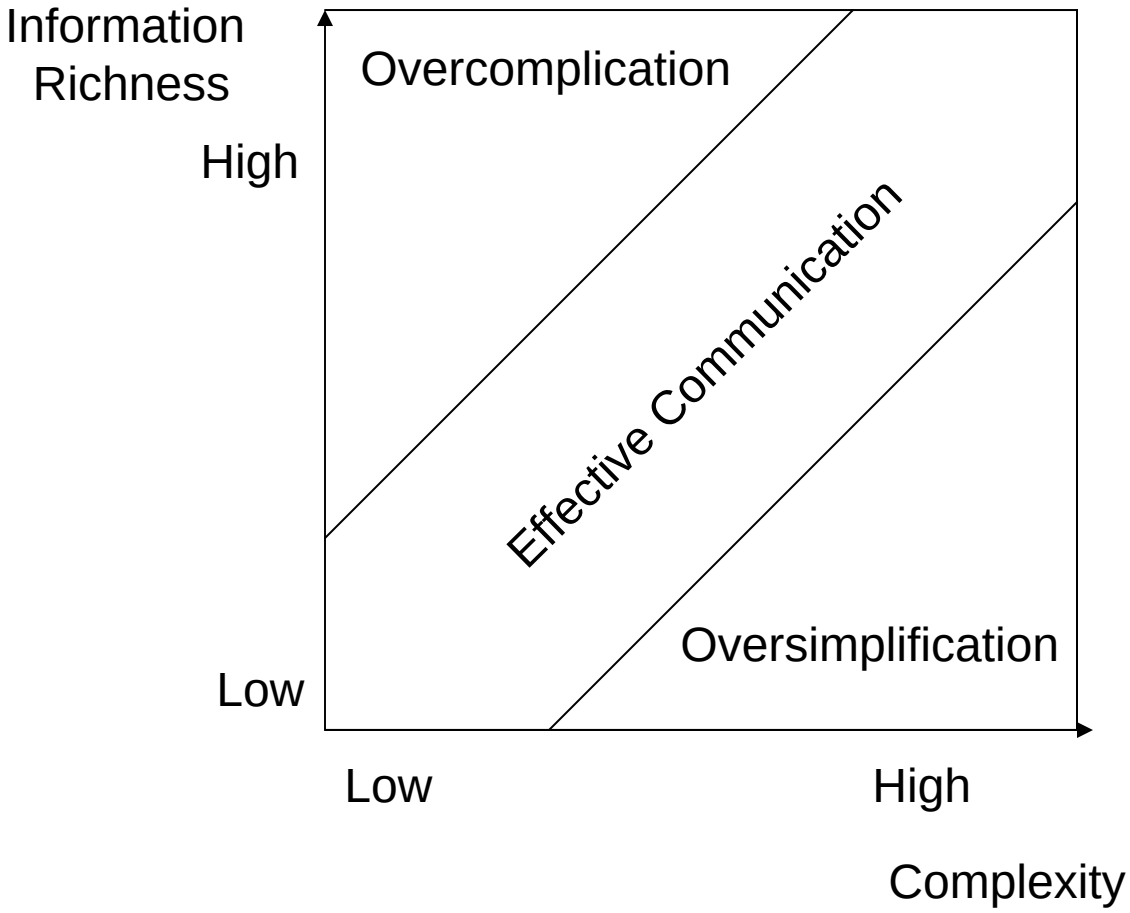
Increasing importance of oral and synchronous media

Increasing possibility of distance

Increasing need for physical proximity

cf. Wigand/Picot/Reichwald (1997)

Media Richness and Managerial Choice (Daft/Lengel)



cf. Wigand/Picot/Reichwald (1997)

Potential and Limitations of ICT

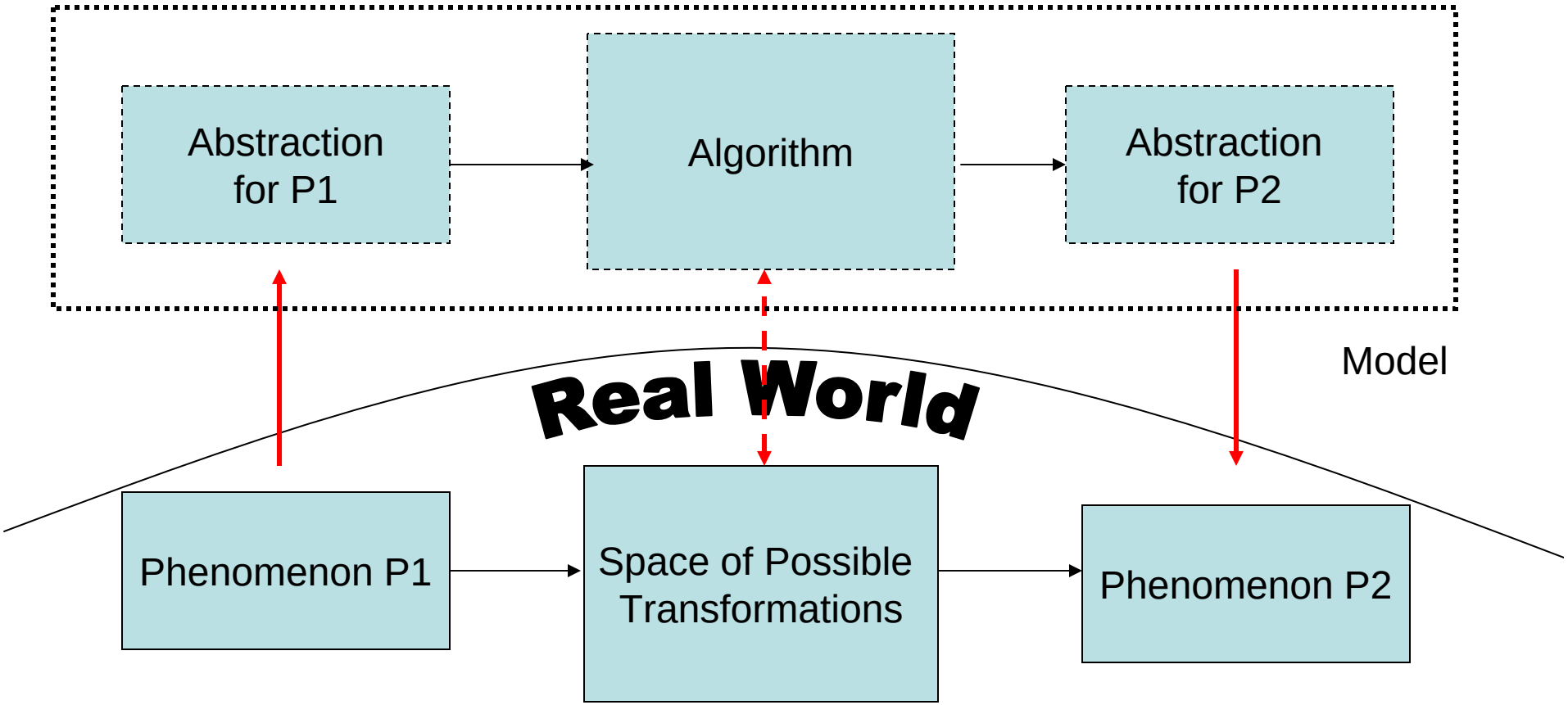
- Computer Systems, Models, and the Real World
- Formalization

Formalization: Importance and Limits

- Formalization as a precondition of ICT
- Algorithms: Sequence of processing steps that solves a given problem
- Alternative means for formalization/modeling/representation
  - Human language (problem: actor- and context-bound)
  - Data Models
  - Ontologies

cf. Wigand/Picot/Reichwald (1997)

Computer Systems, Models, and the Real World



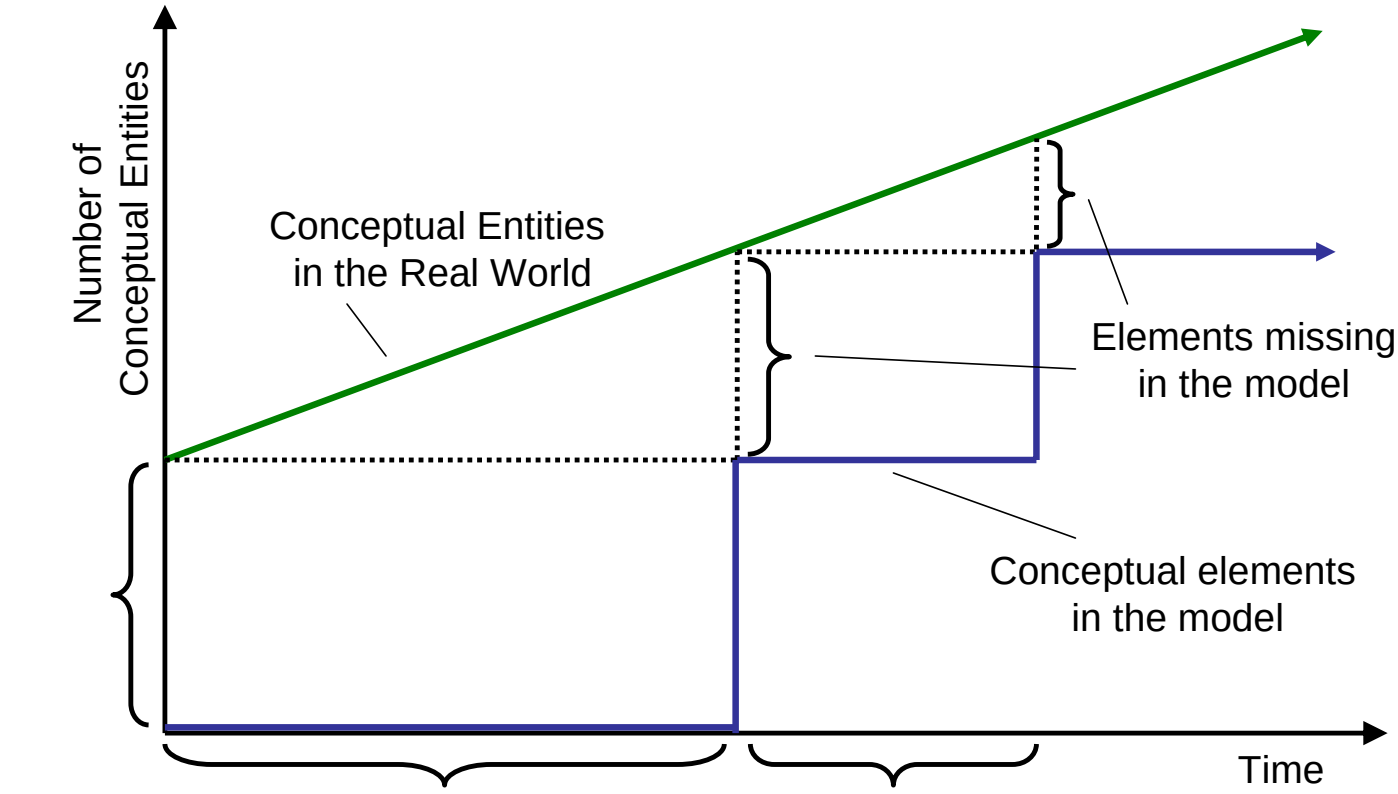
Problem 1: Modeling Costs

- Models can be used to delegate the execution of a formal process to a machine.
- This may save resources.
- However, creating a model consumes resources.
- The total savings do not automatically and always outweigh the modeling costs.

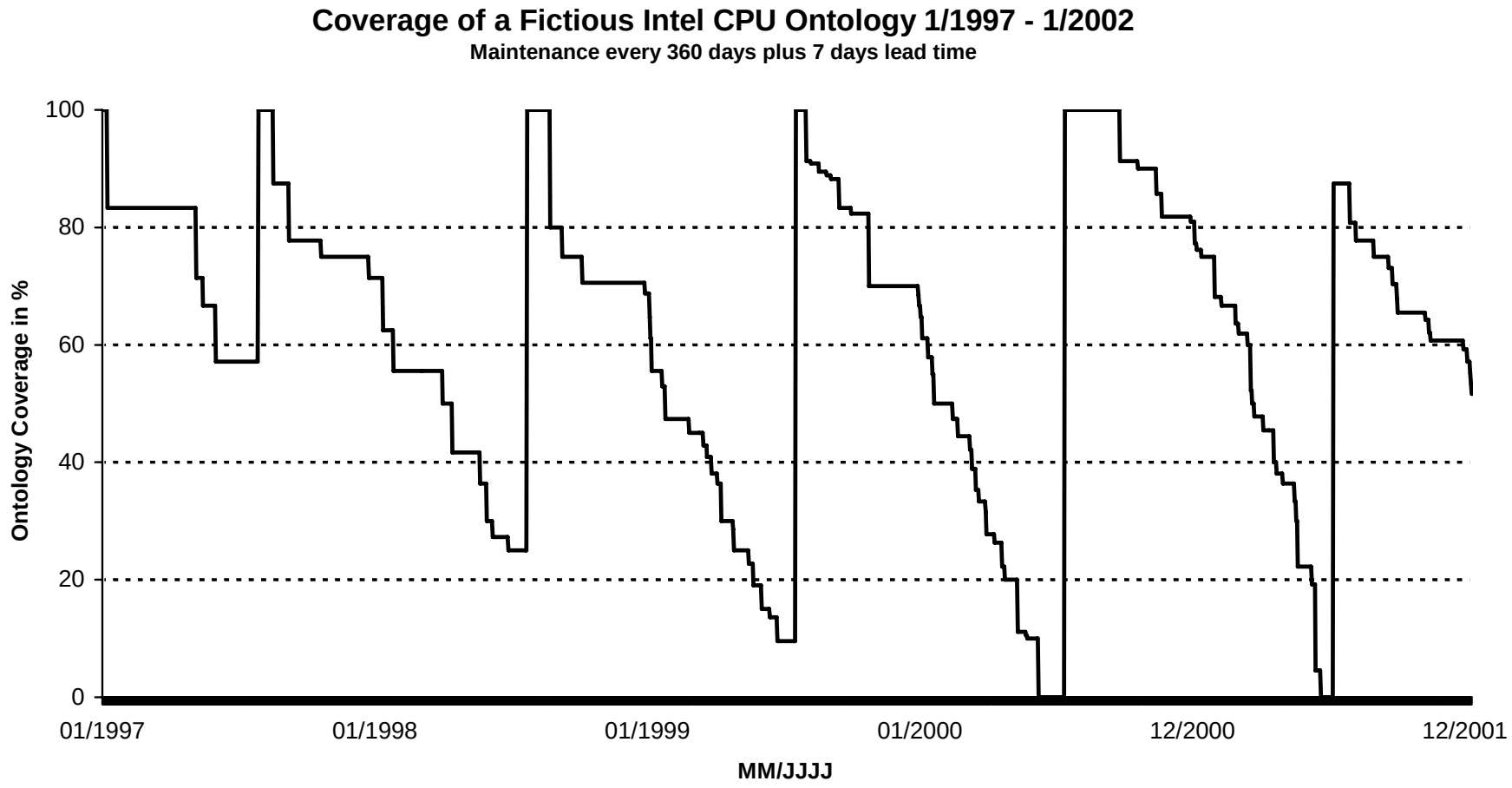
Problem 2: Conceptual Dynamics

- The world is subject to conceptual dynamics
  - new types of goods
  - new requirements
  - new laws and regulations
- We may not be able to yield a model fast enough to keep pace with change.

Example: Updating a Data Model



Domain Dynamics vs. Modeling Lag



Problem 3: Computability

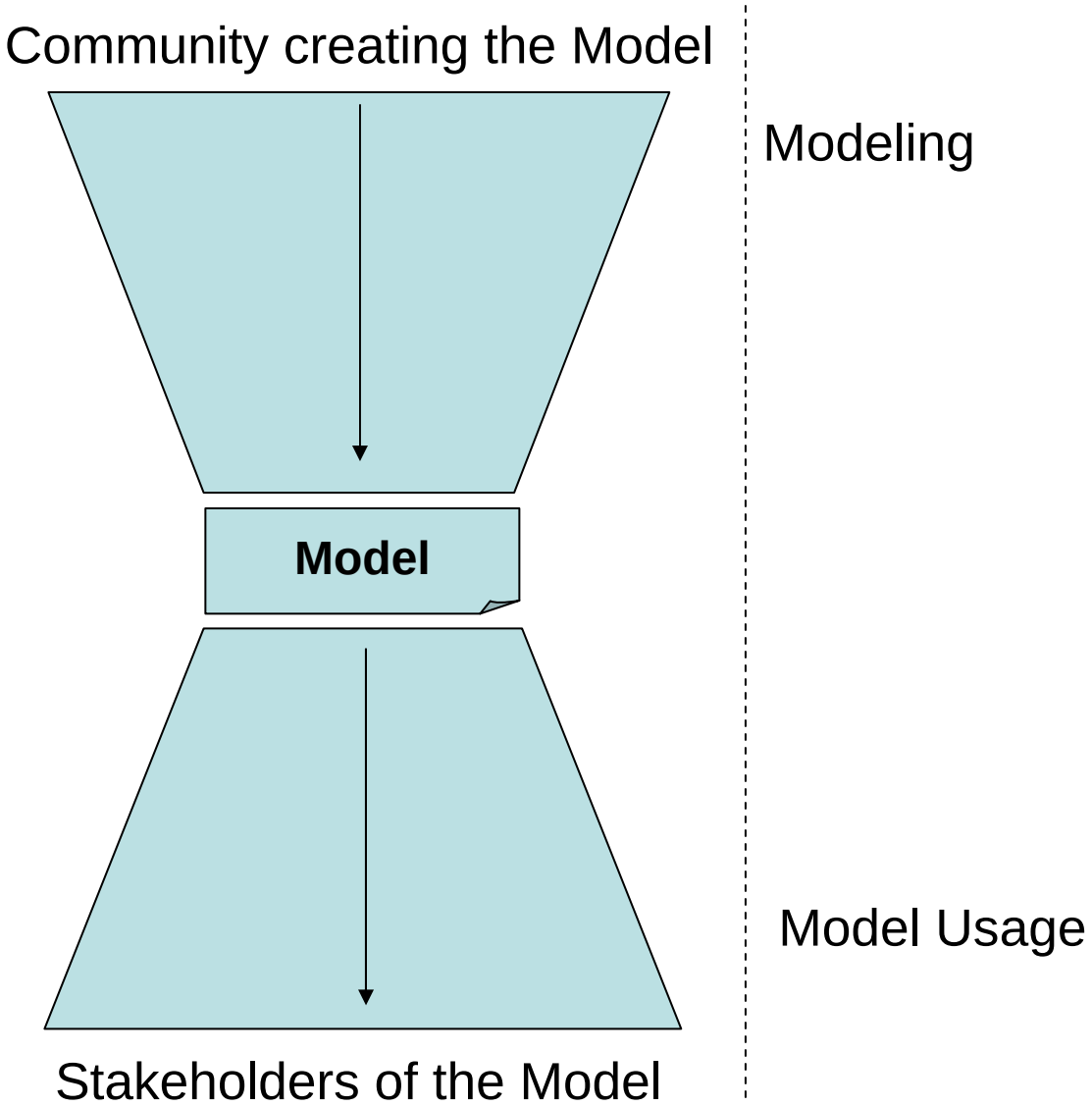
- Many typical business problems can be formalized, but cannot be executed at reasonable computational costs.
- This holds even for rather simple challenges.
- Example: Traveling Salesman Problem
- Also, in business contexts, the time for computing a result may not be available.

cf. Wigand/Picot/Reichwald (1997)

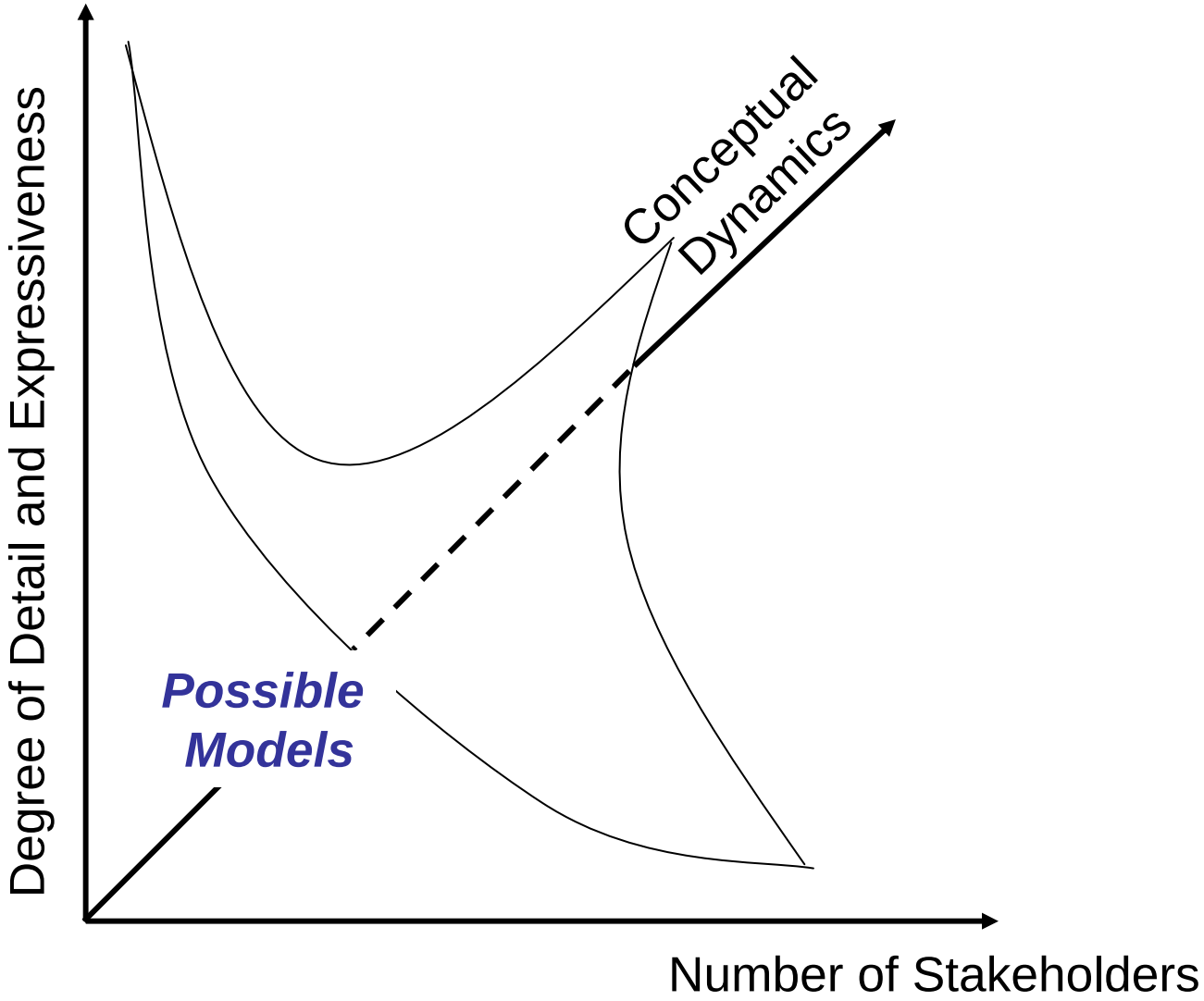
Problem 4: Maintaining the Treaty between Model and Reality

- If multiple business entities or individuals are involved, there need to be continuous agreement that model represents reality properly.

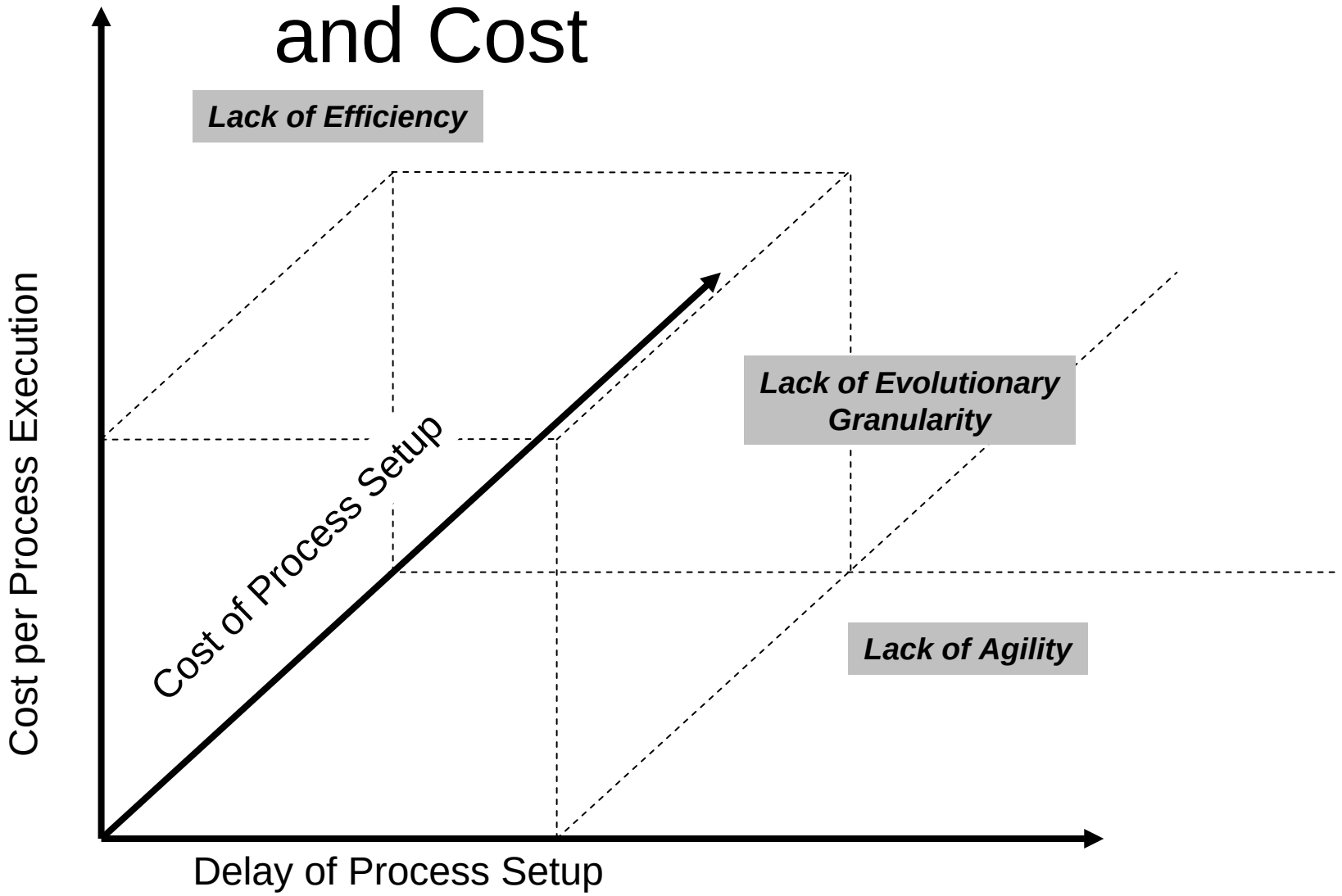
The Model Perspicuity and Agreement Bottleneck



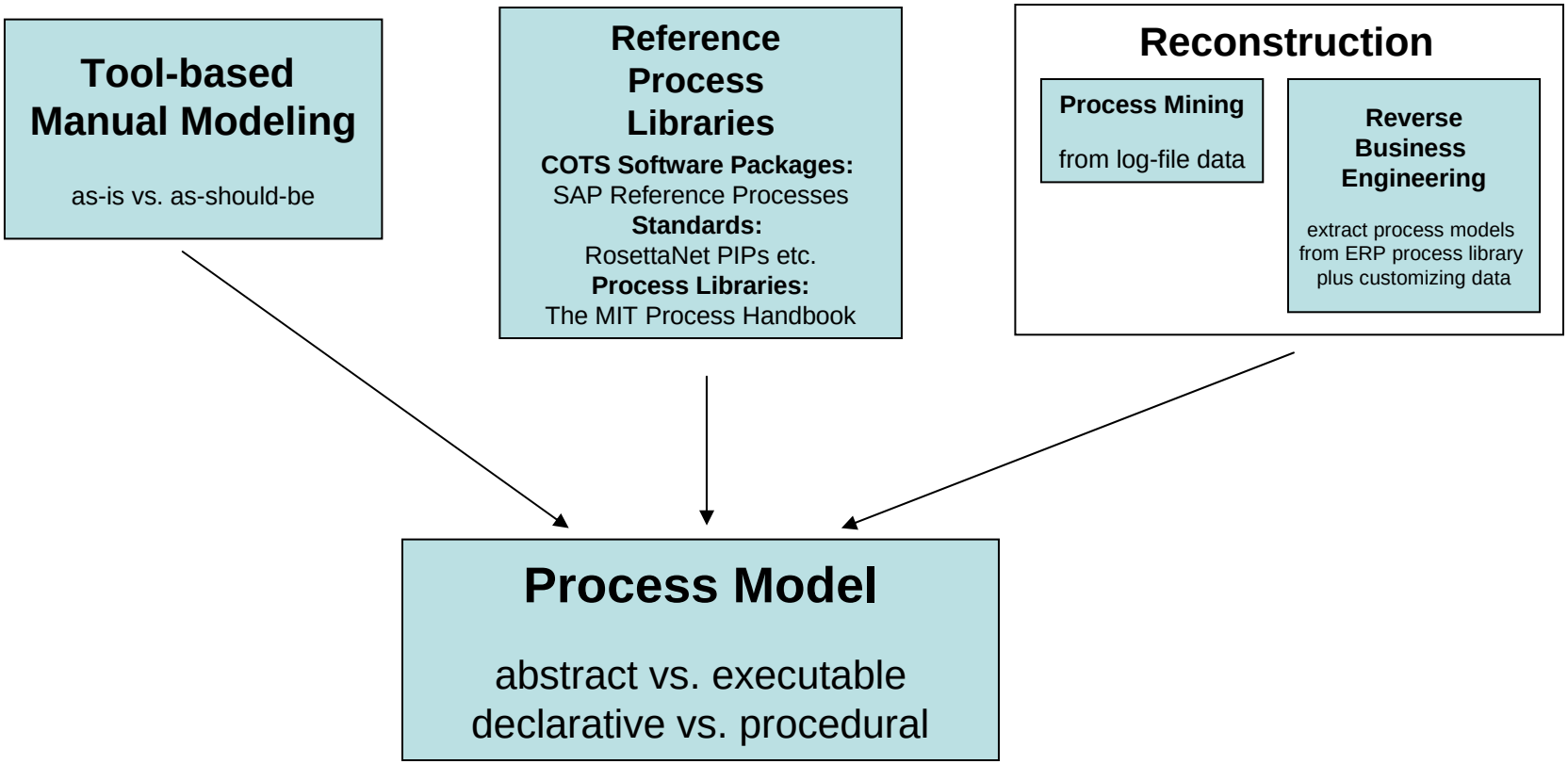
Possible Models



Impact of Business Process Modeling Agility and Cost

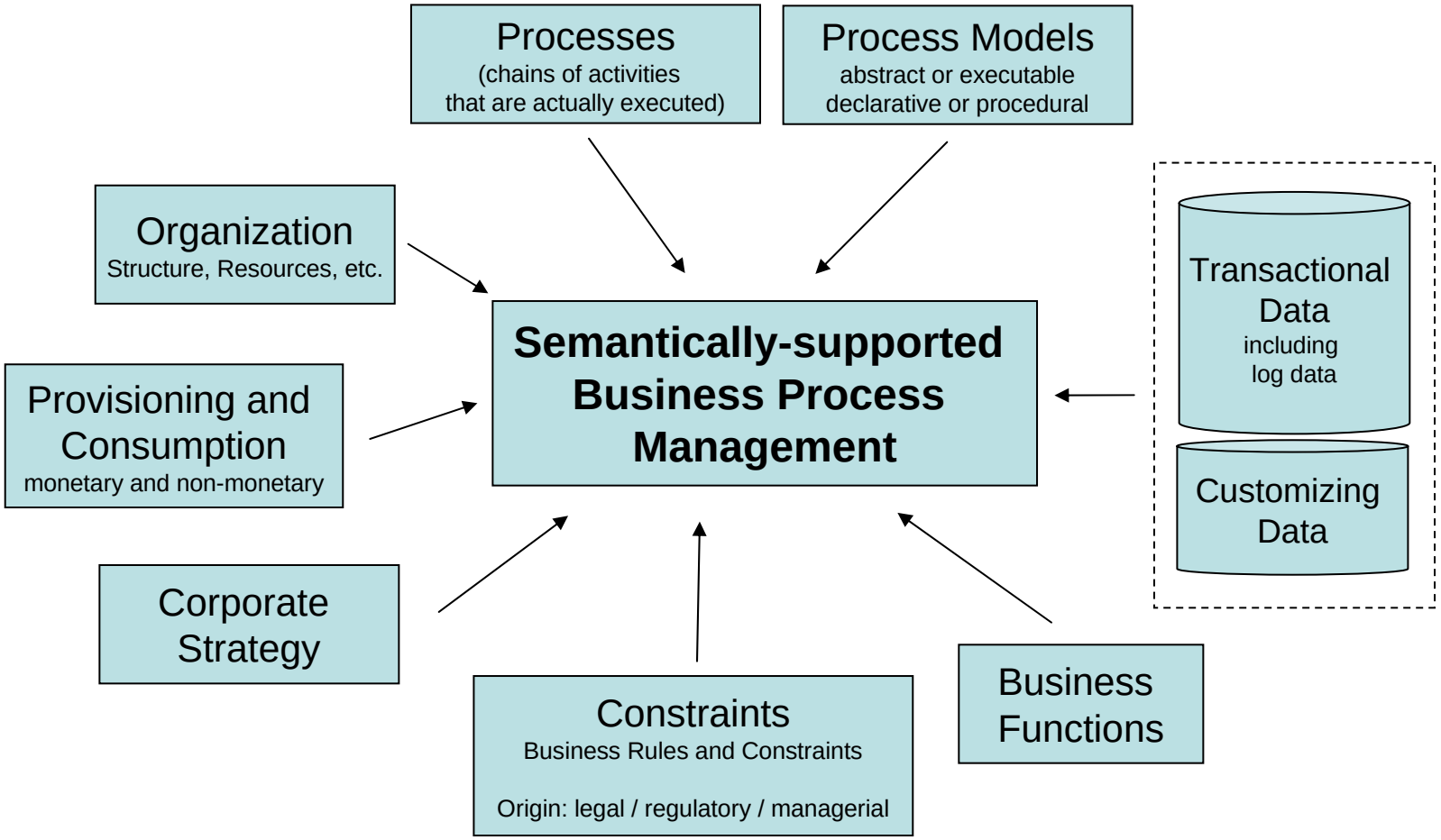


Origins of Business Process Models



Business Processes: Contributing Spheres

der Bundeswehr Universität München

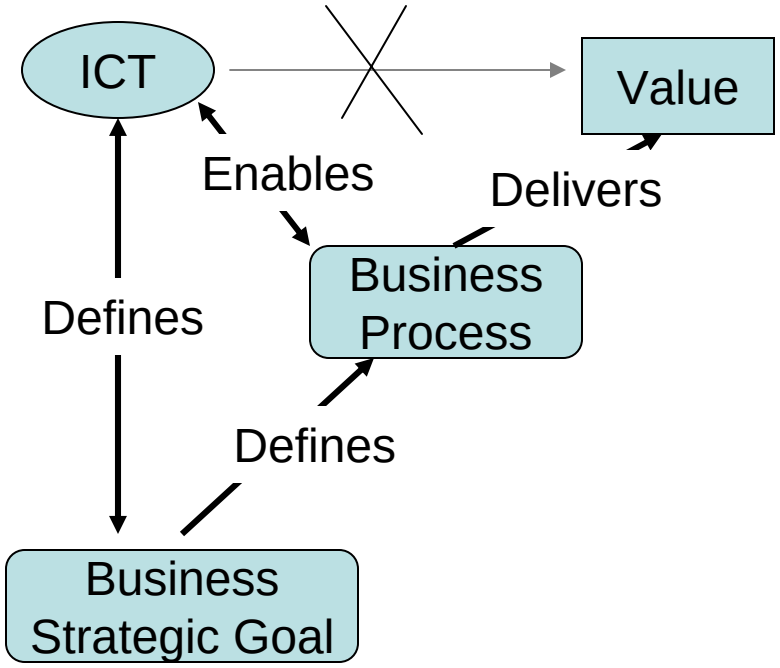


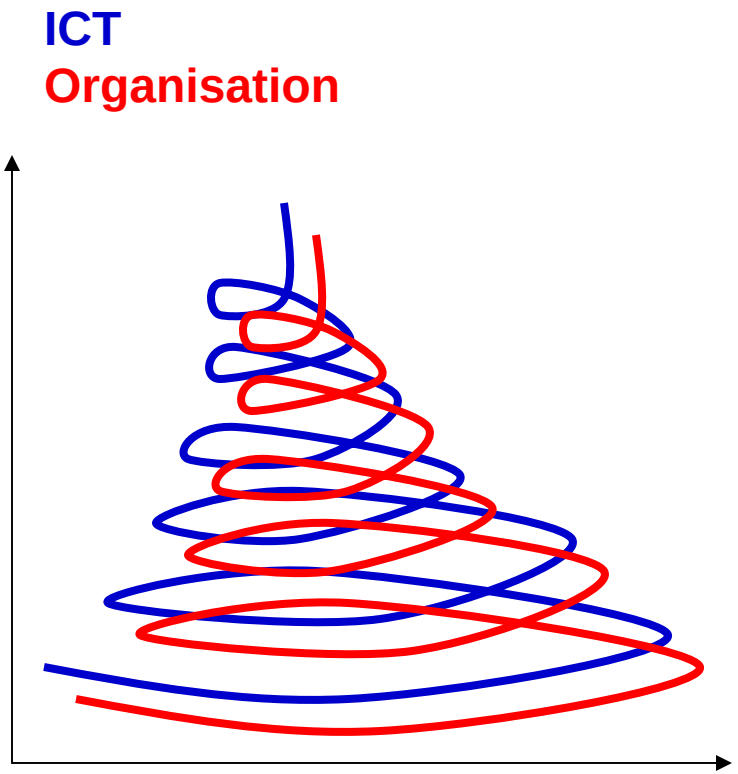
ICT and Society

- Science: Basically, *understanding* the world.
- Technology: Application of scientific knowledge
- Utility for society?
  - Utopian perspective: primarily positive effects
  - Neutral view: technology has no correlation with societal problems.
  - Contingency perspective: technology solves and creates problems → individual and selective judgment

cf. Wigand/Picot/Reichwald (1997)

ICT and the Organization



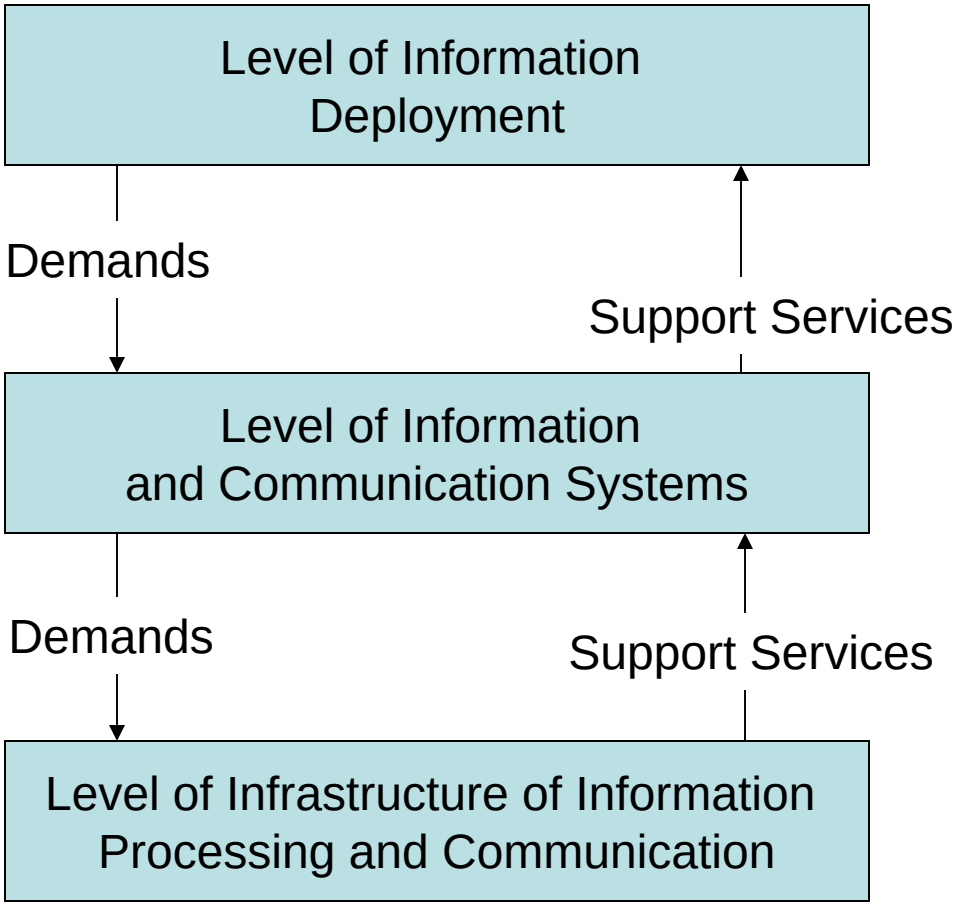


cf. Wigand/Picot/Reichwald (1997)

cf. Thome (1996)

Three Levels of Information Management

- Information Deployment
- Information and Communication Systems
- Information and Communication Technology Infrastructure



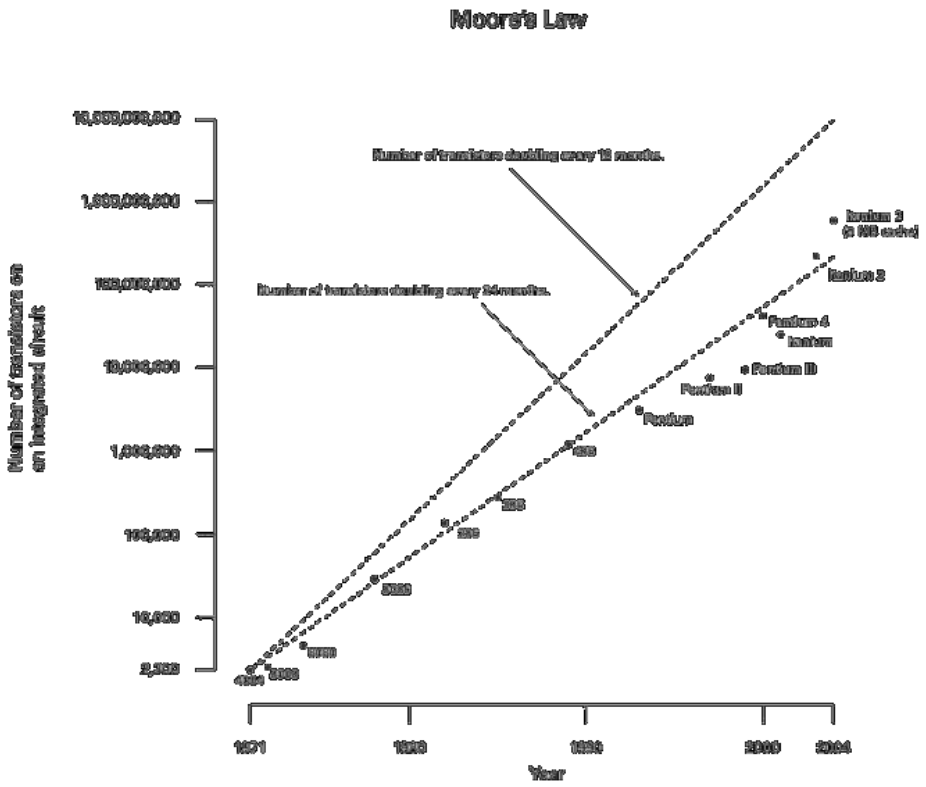
cf. Wigand/Picot/Reichwald (1997)

Exponential Growth – Typical „Laws“

- Moore‘s Law
- Metcalf‘s Law

Moore‘s Law

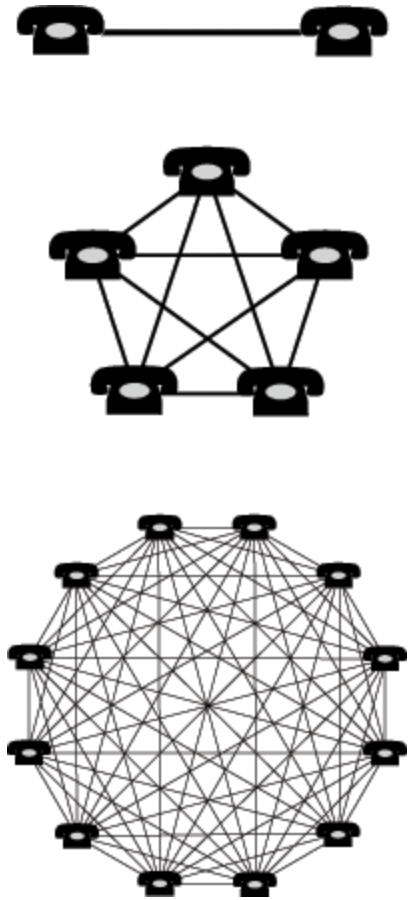
- Empirical observation made in 1965 that the number of transistors on an integrated circuit for minimum component cost **doubles** every 24 months



cf. Wikipedia

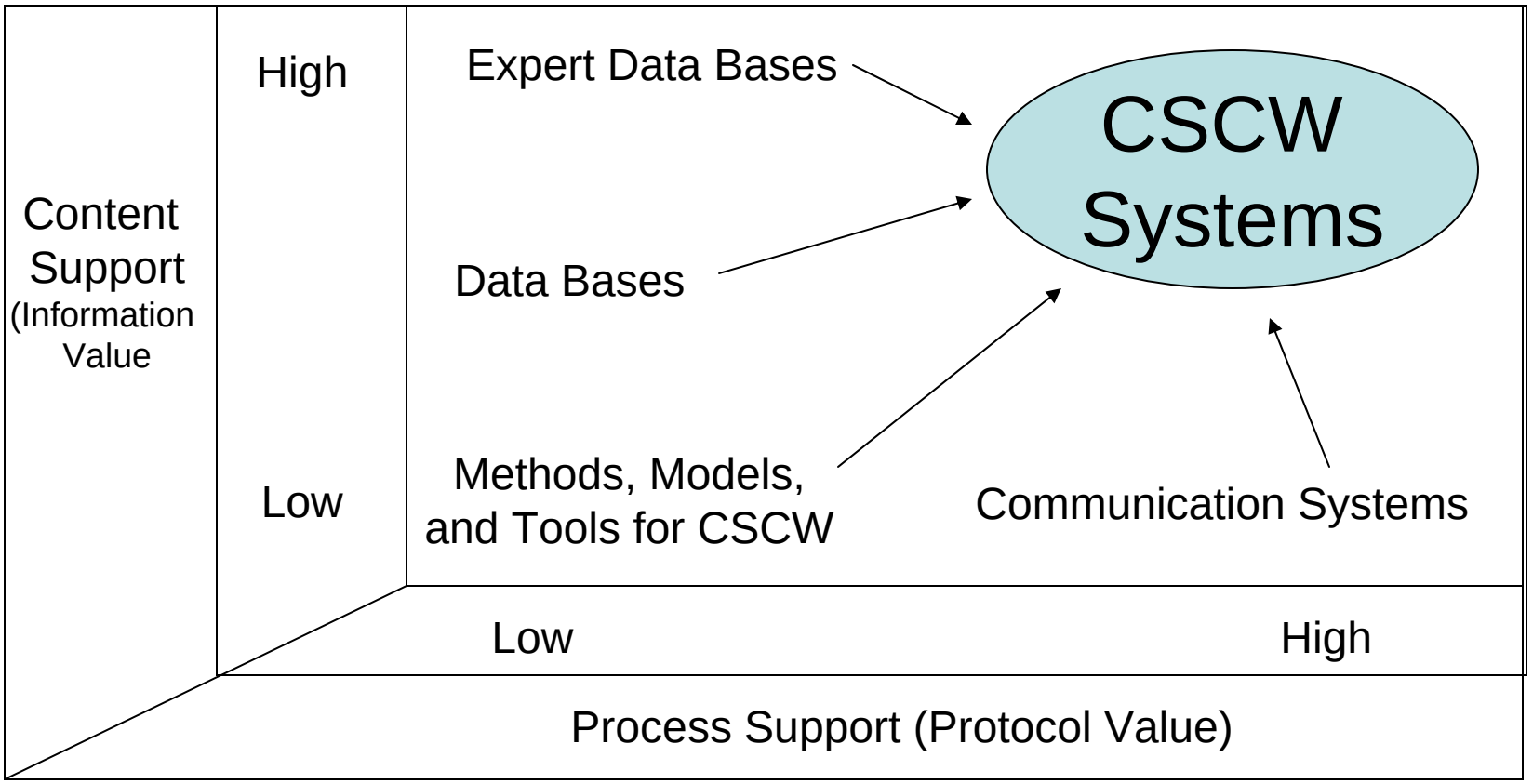
Metcalf‘s Law

- The value of a telecommunications network is proportional to the square of the number of users of the system (n2).
- First formulated by Robert Metcalfe in regard to Ethernet.
- Explains many of the network effects of communication technologies and networks such as the Internet and World Wide Web.



cf. Wikipedia

Content- and Process-oriented Support for Collaborative Task Accomplishment



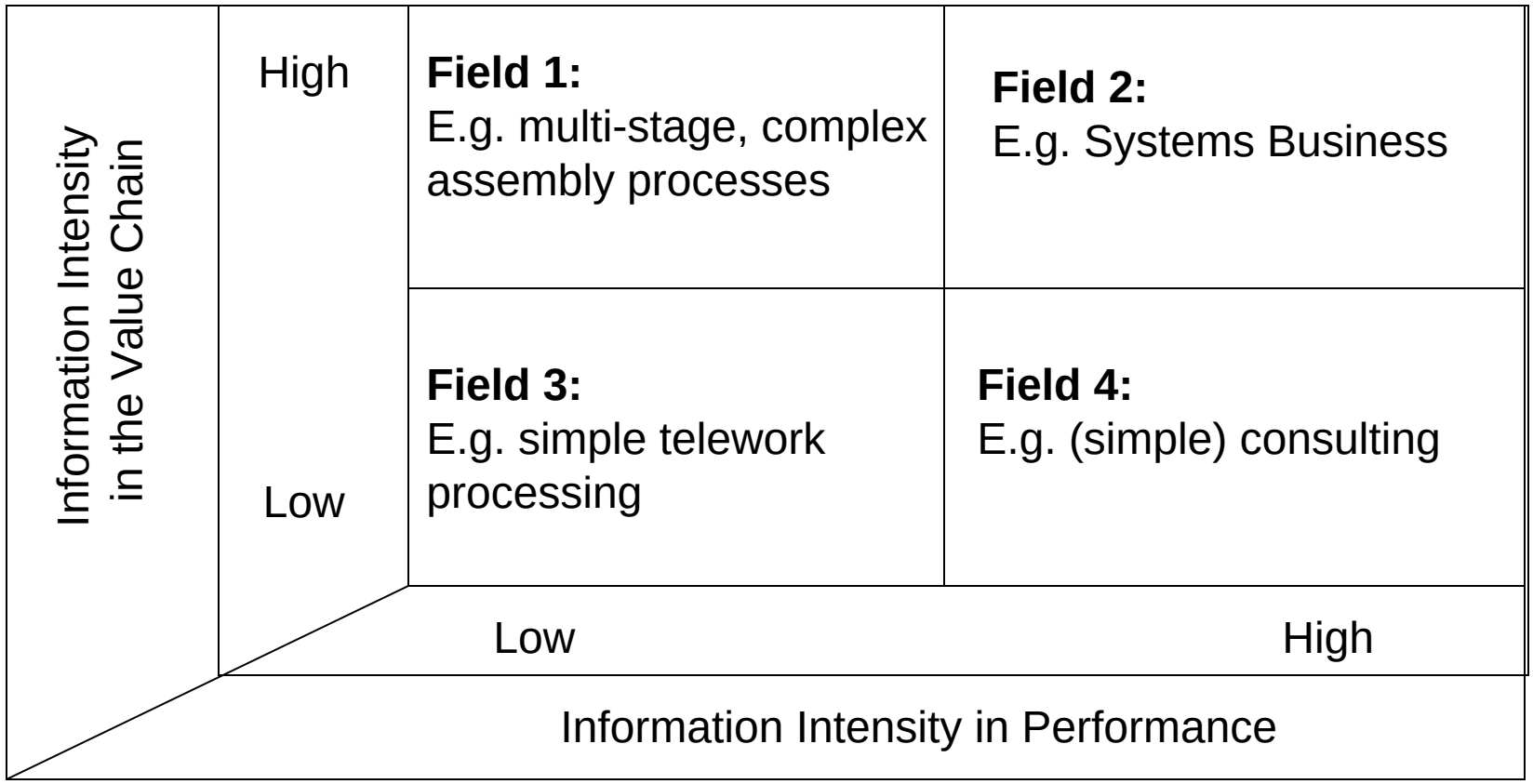
cf. Wigand/Picot/Reichwald (1997)

Typology of Communication for Collaboration

Presence of Participants	**Same time**	**Different times**
Same location	Comprehensive computer-supported session Computer-supported moderated session Group decision support system Presentation software	Group Calendar Project Management Software
Different locations	Audio / Video conference Screen sharing Instant Messaging	Wikis Bulletin Boards Multi-Authors software CVS

cf. Wigand/Picot/Reichwald (1997)

Information Intensity



cf. Wigand/Picot/Reichwald (1997)

Integration

- Data Integration
- Process Integration
- Model Integration

Open Systems

- „The complete and consistent number of international technology standards and functional standards for the specififcation of interfaces, services, and formats for the assurance of interoperability and portability of applications, data, and people.“

cf. Wigand/Picot/Reichwald (1997)

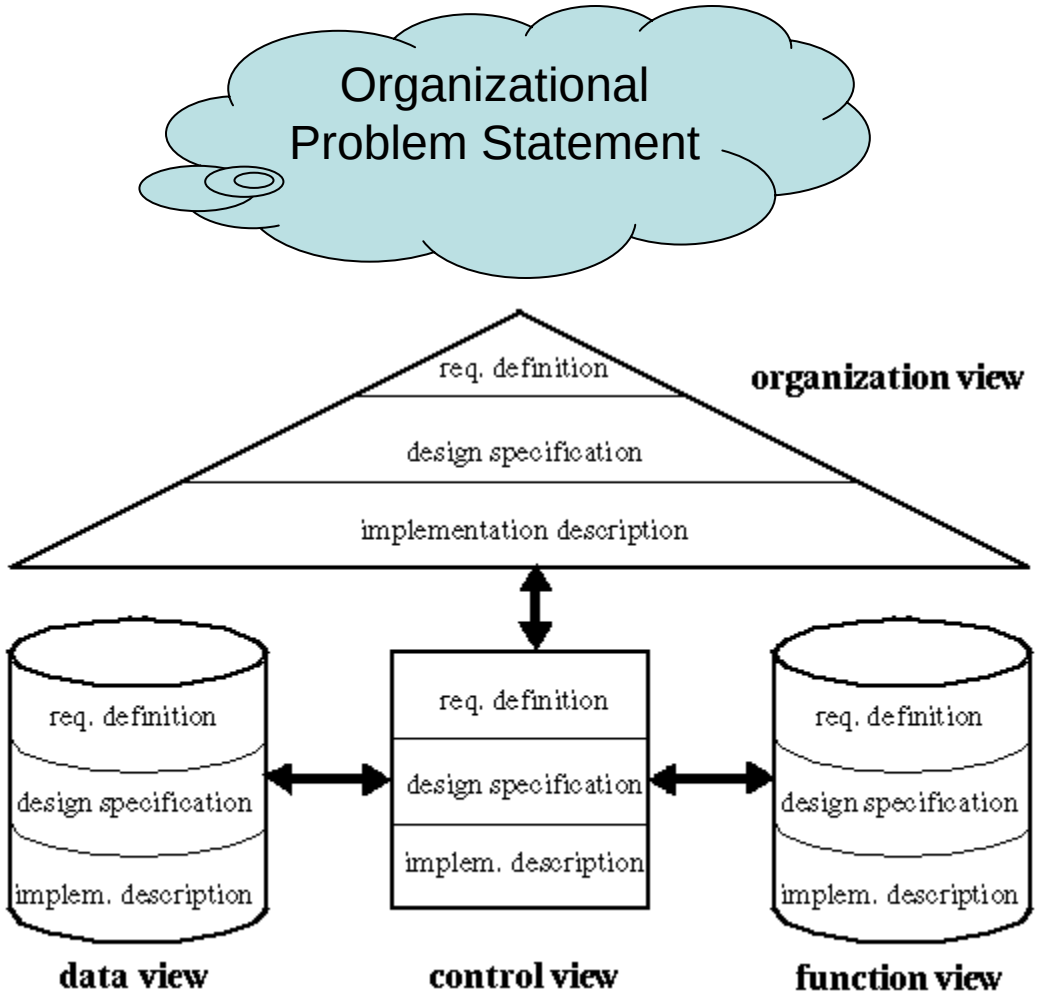
Globalization

- Distribution of technical and human resources across the world
- Time-zones, cultural contexts,....

Systems Development

- Waterfall
- Spiral Model

The ARIS House of Business



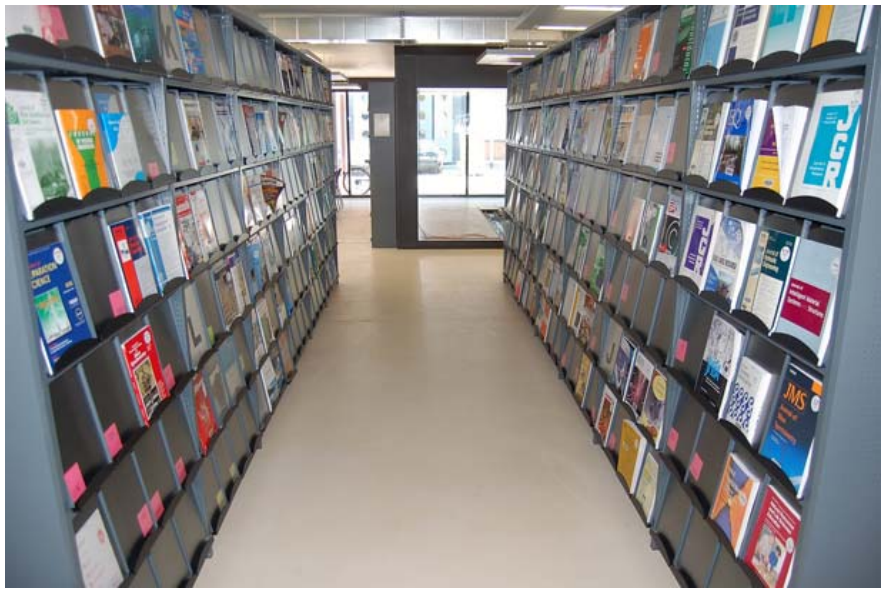
cf. Scheer (1998)

Common-Of-The-Shelf Business Software vs. Development

der Bundeswehr Universität München

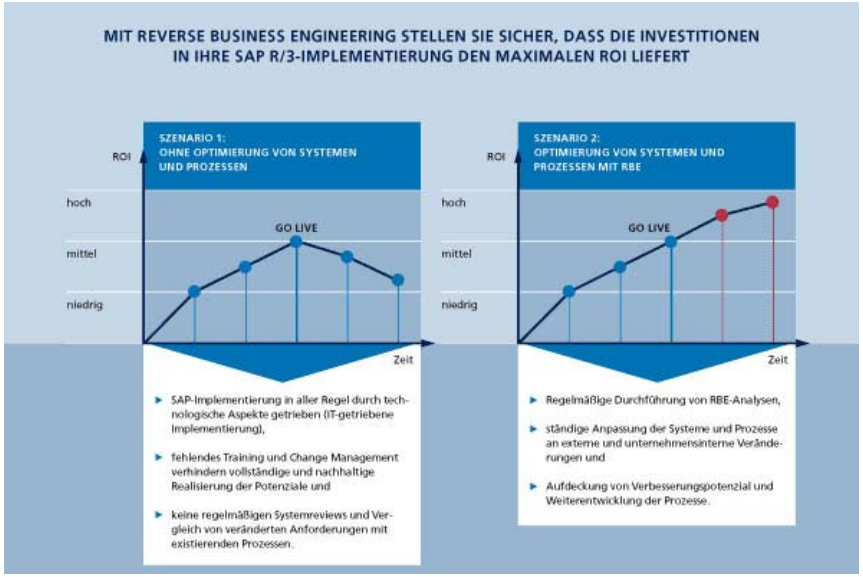
- Home-grown Chaos

- Library Role



Reverse Business Engineering

- Analyse transactional data and customizing data in large ERP landscapes



cf. IBIS AG

Productivity Paradoxon

- It was so far impossible to show a causal relationship between ICT usage and value added
- Explanations

cf. Wigand/Picot/Reichwald (1997)

Thank you.

http://www.heppnetz.de/teaching/img/