

# Information, Organization, and Management

## Unit 4

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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

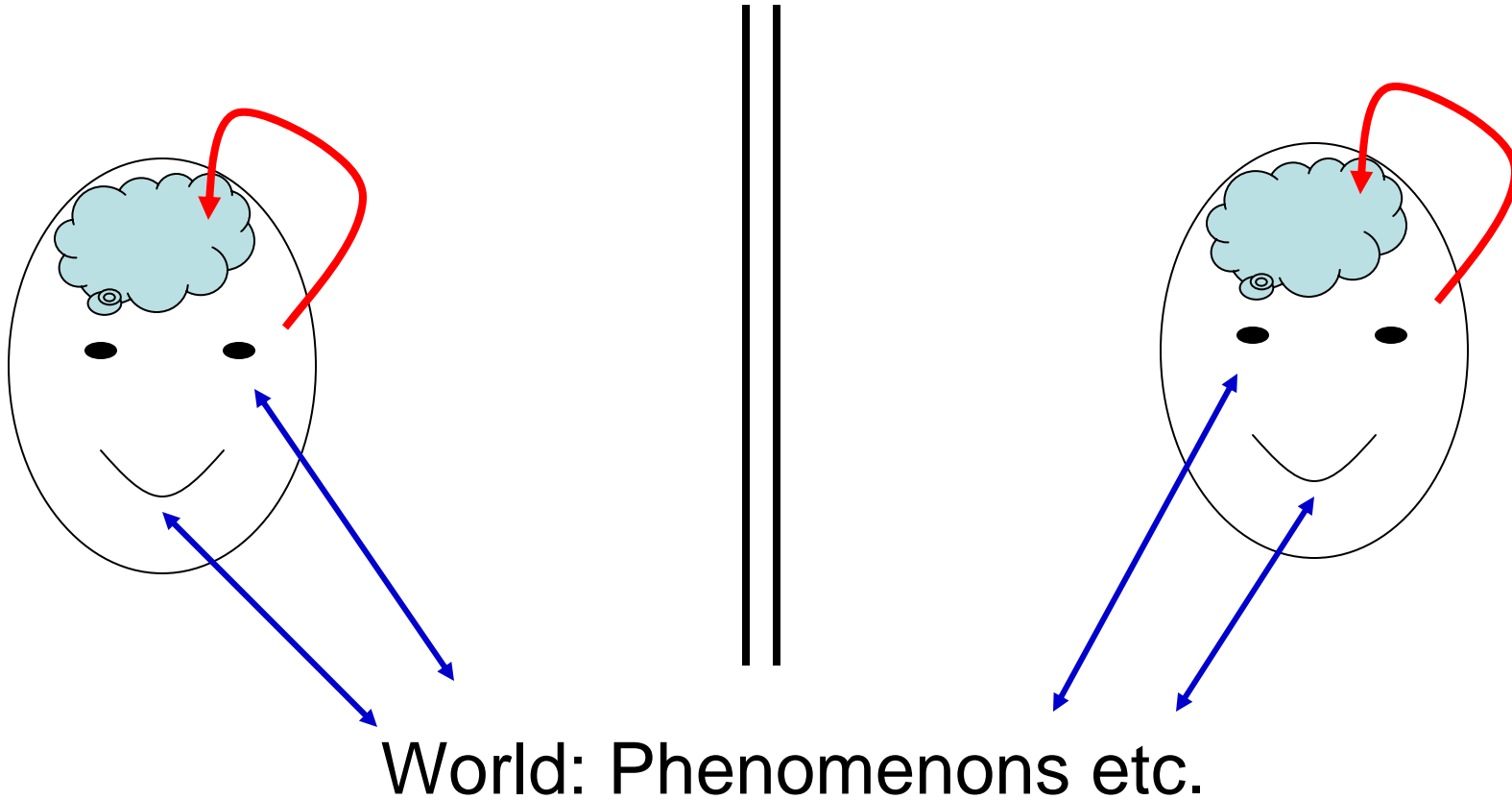
cf. Wigand/Picot/Reichwald (1997)

# 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 Constructivism



# 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 decision-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

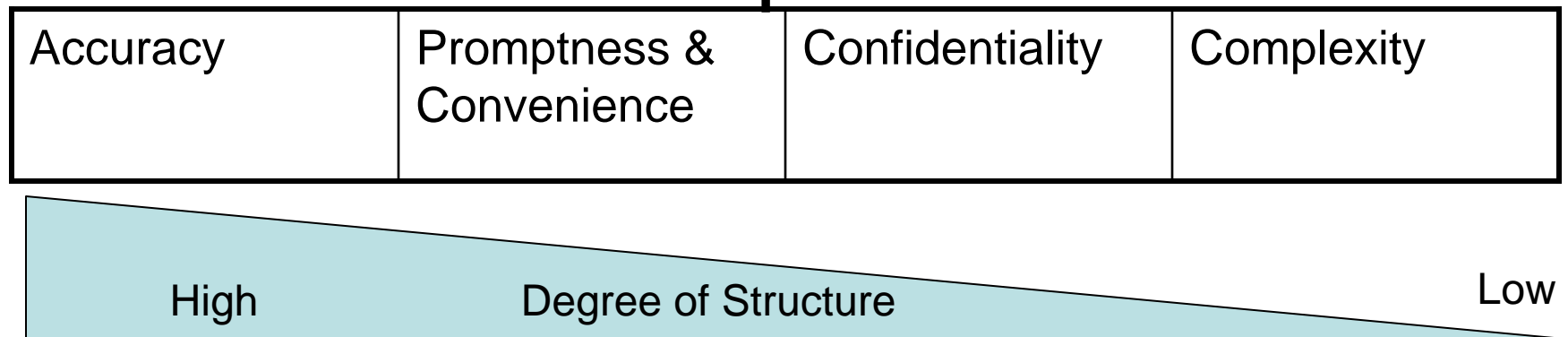
cf. Wigand/Picot/Reichwald (1997)

# 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



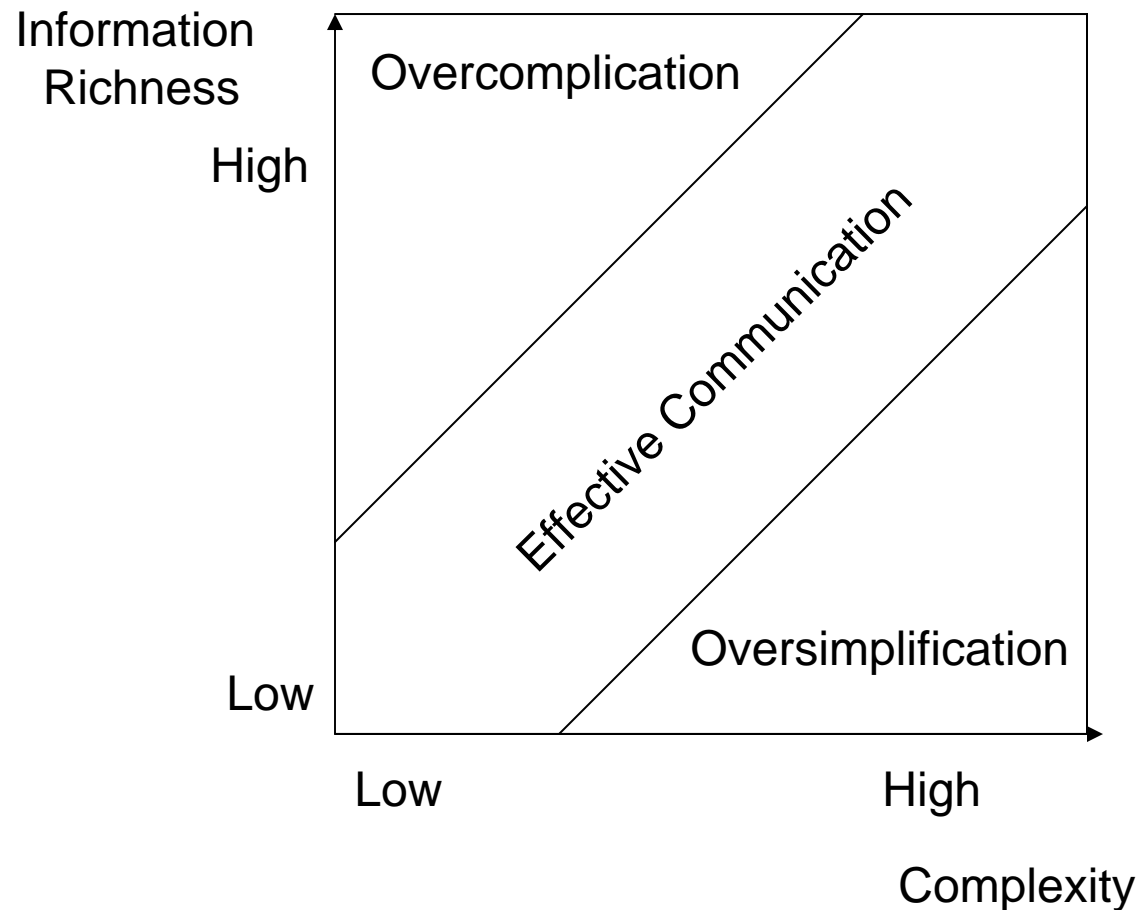
← Increasing importance of written and asynchronous media

→ Increasing importance of oral and synchronous media

← Increasing possibility of distance

→ Increasing need for physical proximity

# Media Richness and Managerial Choice (Daft/Lengel)



Martin Hepp: Information Management

cf. Wigand/Picot/Reichwald (1997)

# Potential and Limitations of ICT

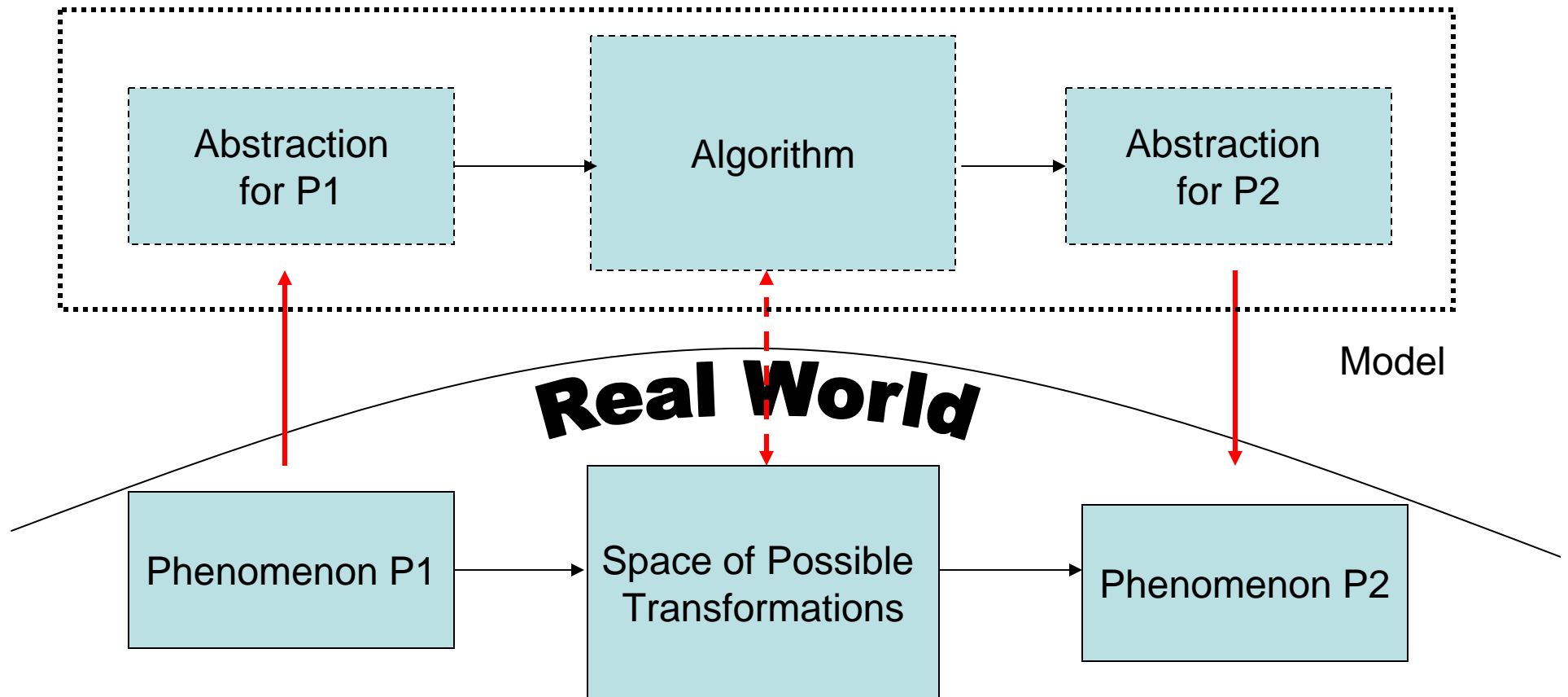
- Computer Systems, Models, and the Real World
- Formalization

# 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



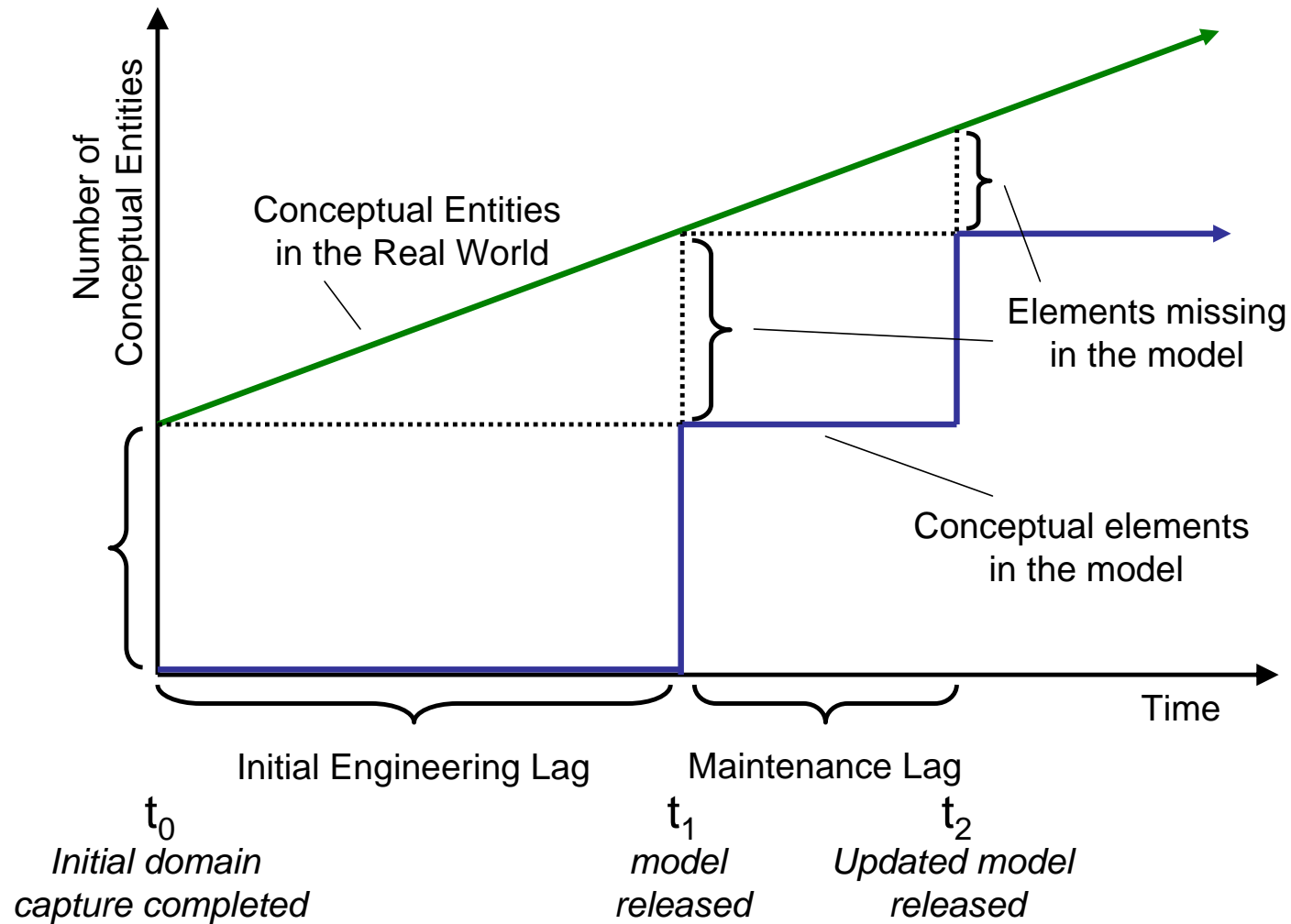
# Problem 1: Modeling Costs

- 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

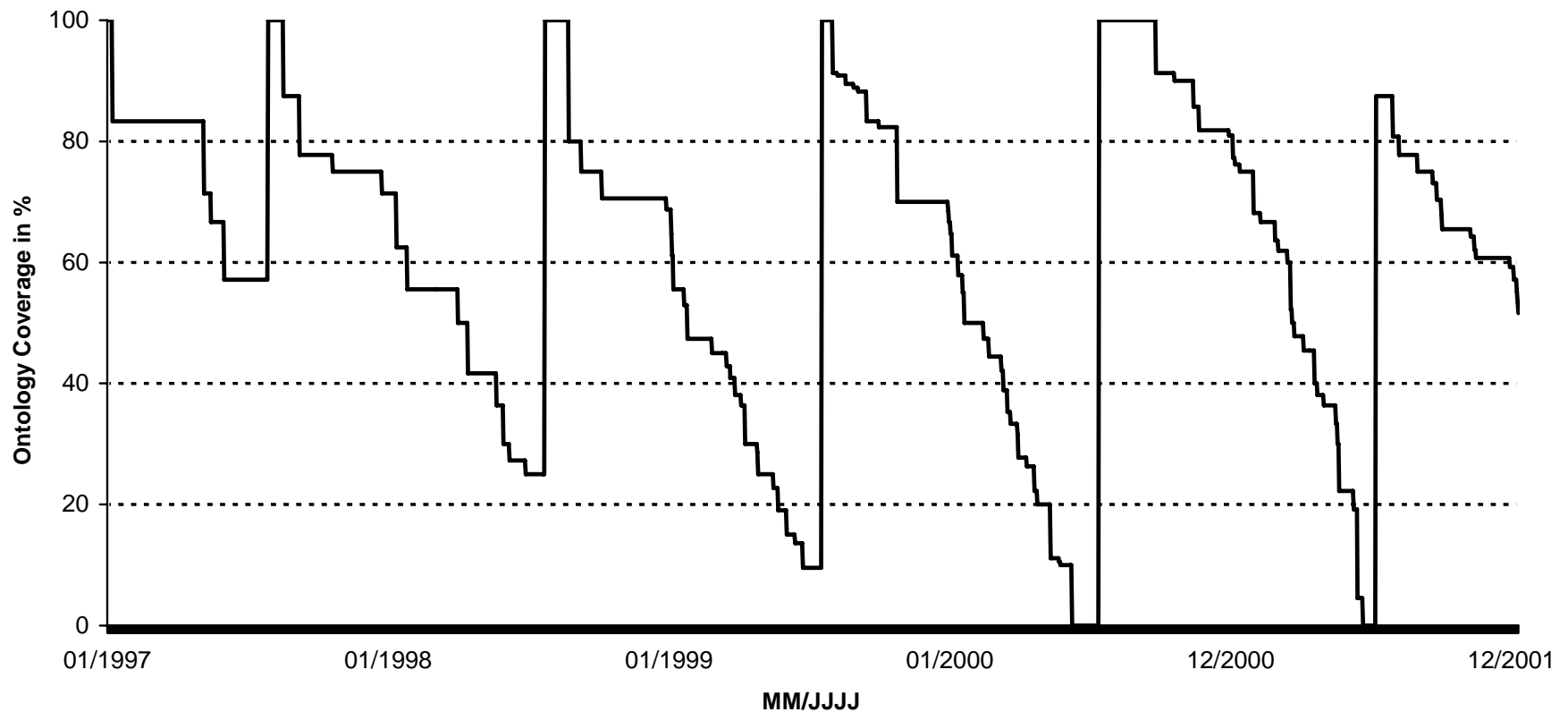
- The world is subject to conceptual dynamics
  - new types of goods
  - new requirements
  - new laws and regulations
- We may not be able to yield a model fast enough to keep pace with change.

# Example: Updating a Data Model



# Domain Dynamics vs. Modeling Lag

Coverage of a Fictitious Intel CPU Ontology 1/1997 - 1/2002  
Maintenance every 360 days plus 7 days lead time



## 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.

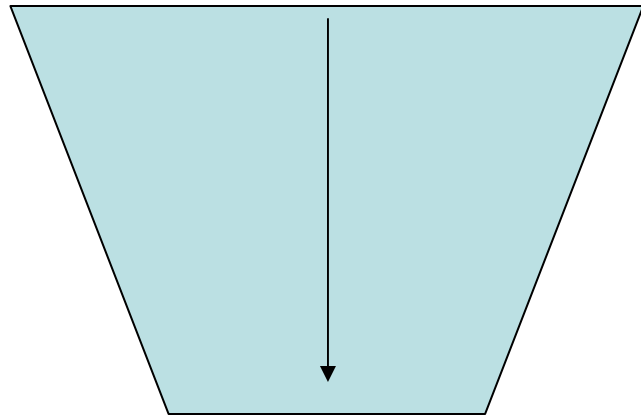
cf. Wigand/Picot/Reichwald (1997)

## 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.

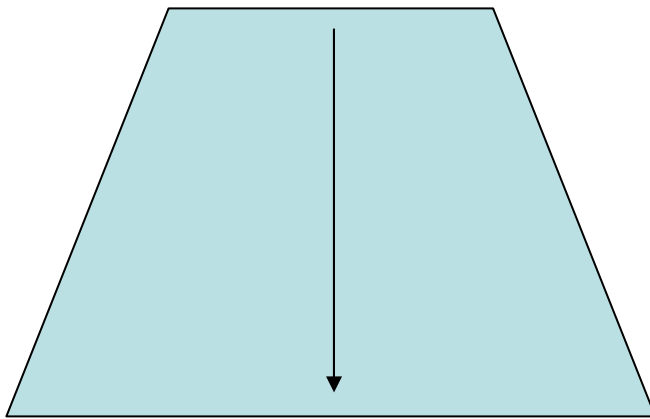
# The Model Perspicuity and Agreement Bottleneck

Community creating the Model



Modeling

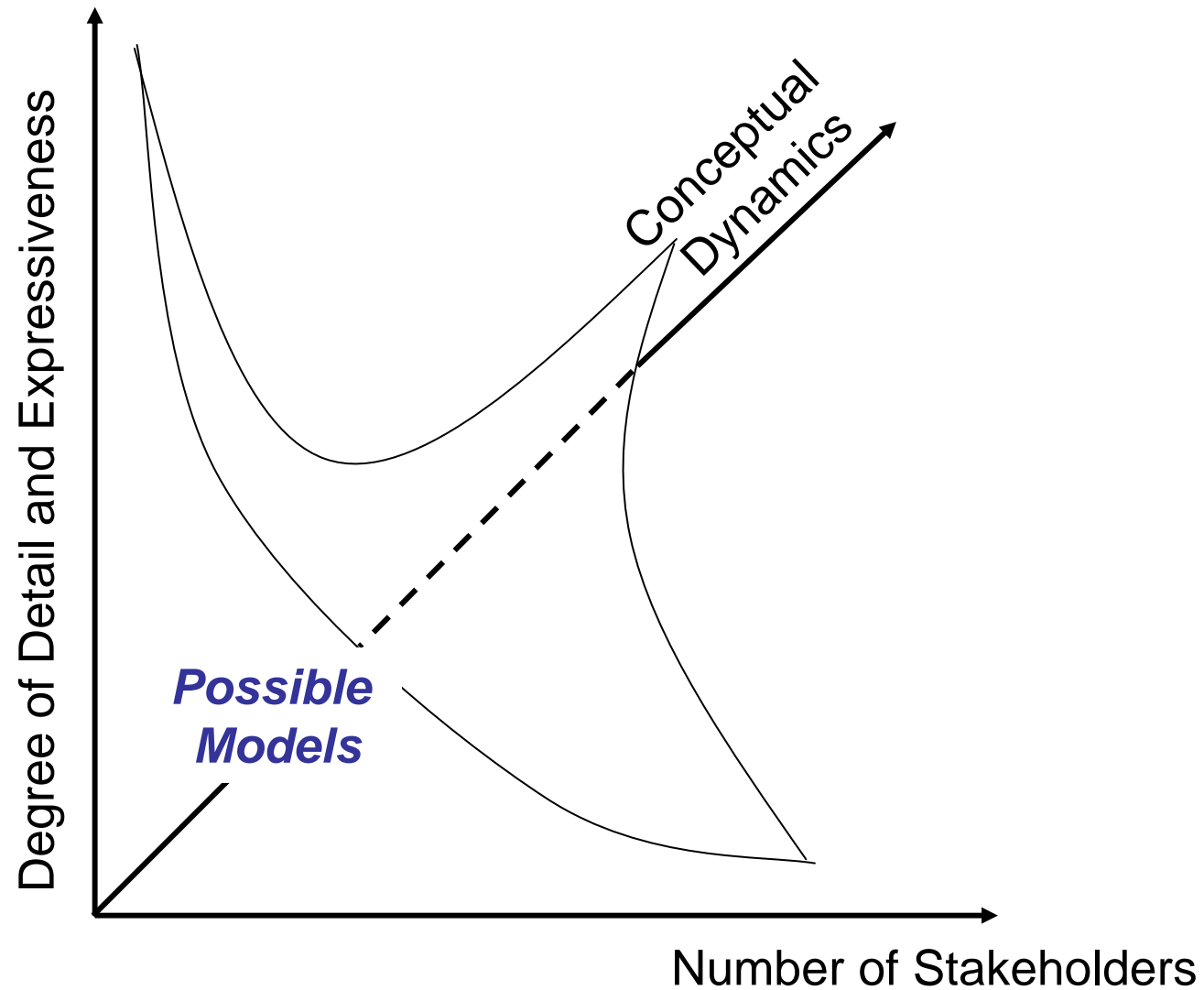
**Model**



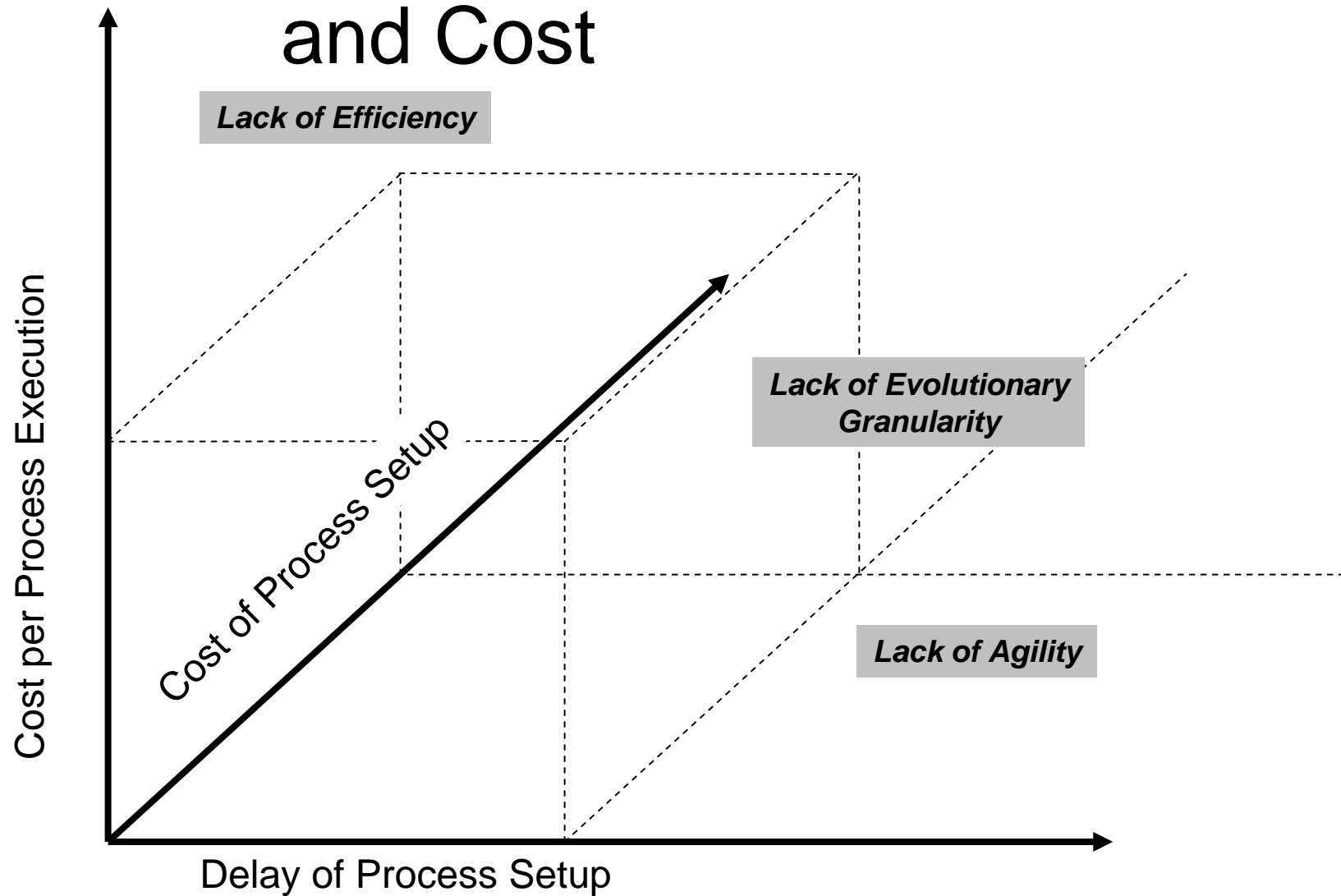
Model Usage

Stakeholders of the Model

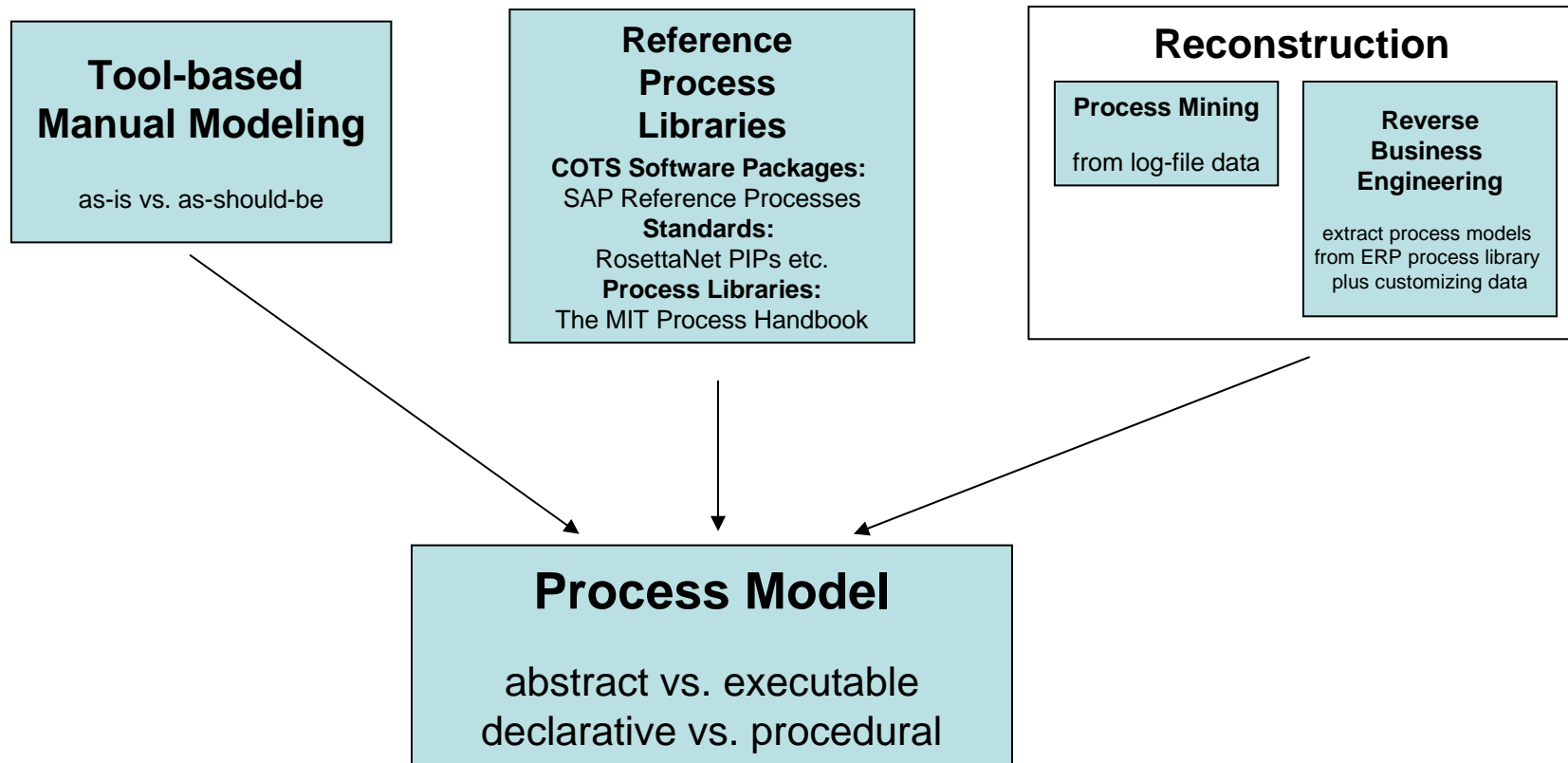
# Possible Models



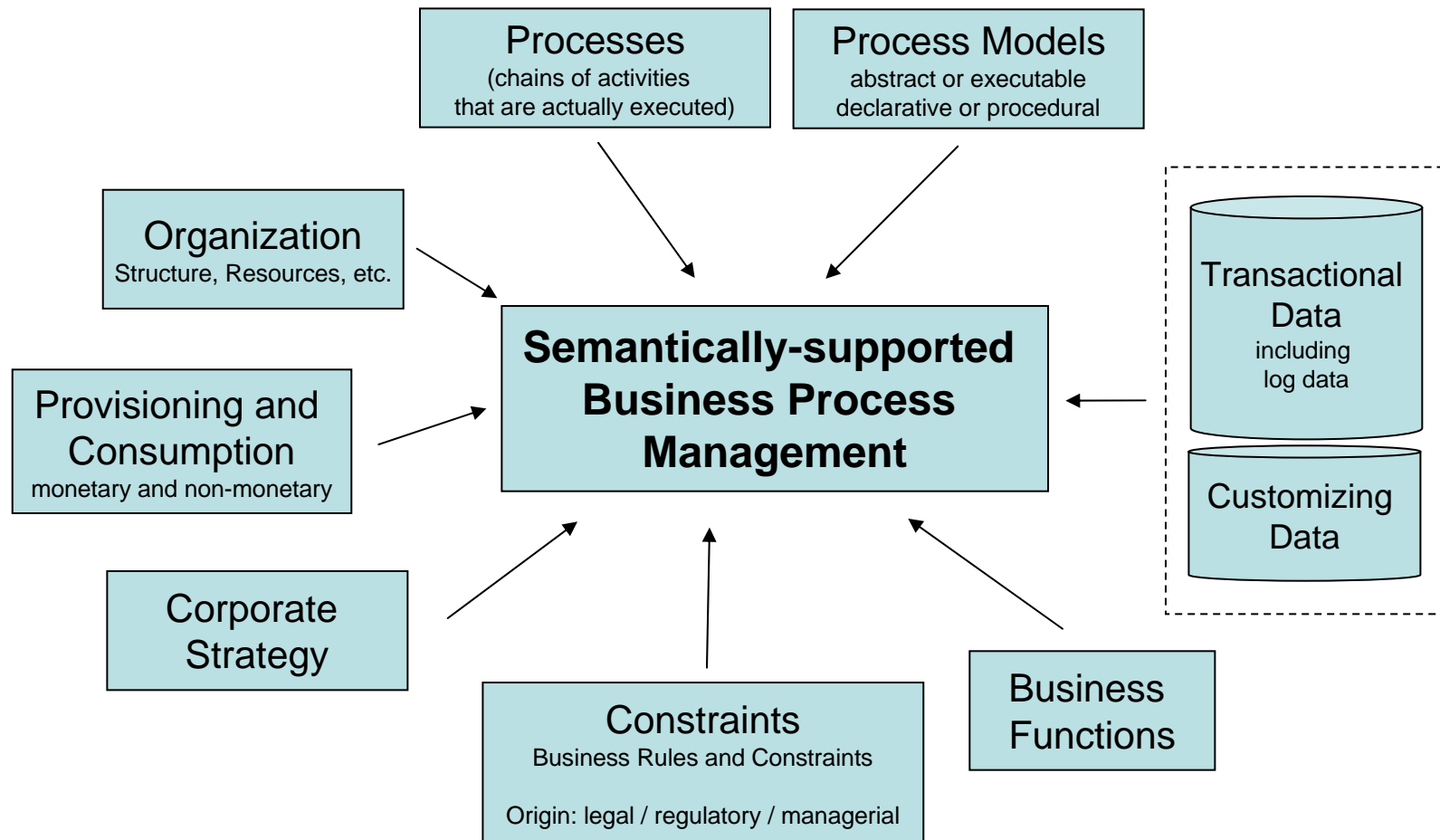
# Impact of Business Process Modeling Agility and Cost



# Origins of Business Process Models



# Business Processes: Contributing Spheres

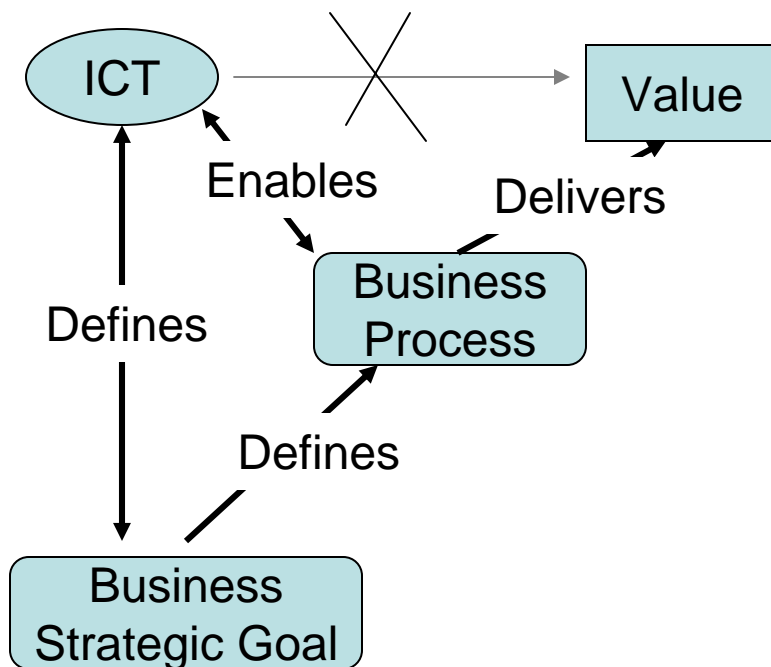


# ICT and Society

- 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

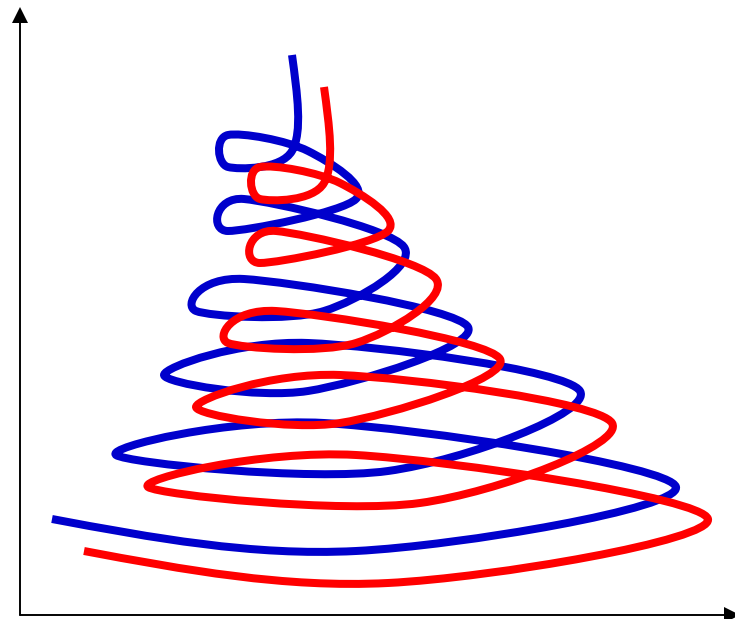
cf. Wigand/Picot/Reichwald (1997)

# ICT and the Organization



cf. Wigand/Picot/Reichwald (1997)

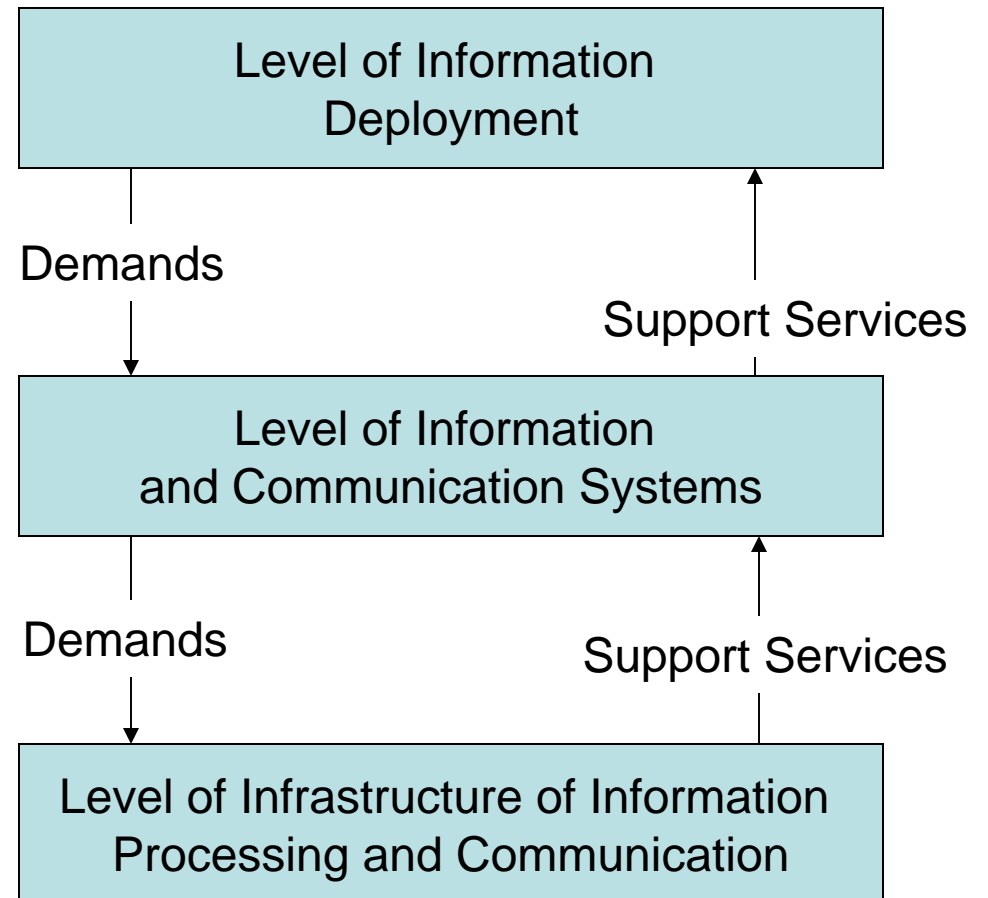
**ICT**  
**Organisation**



cf. Thome (1996)

# Three Levels of Information Management

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



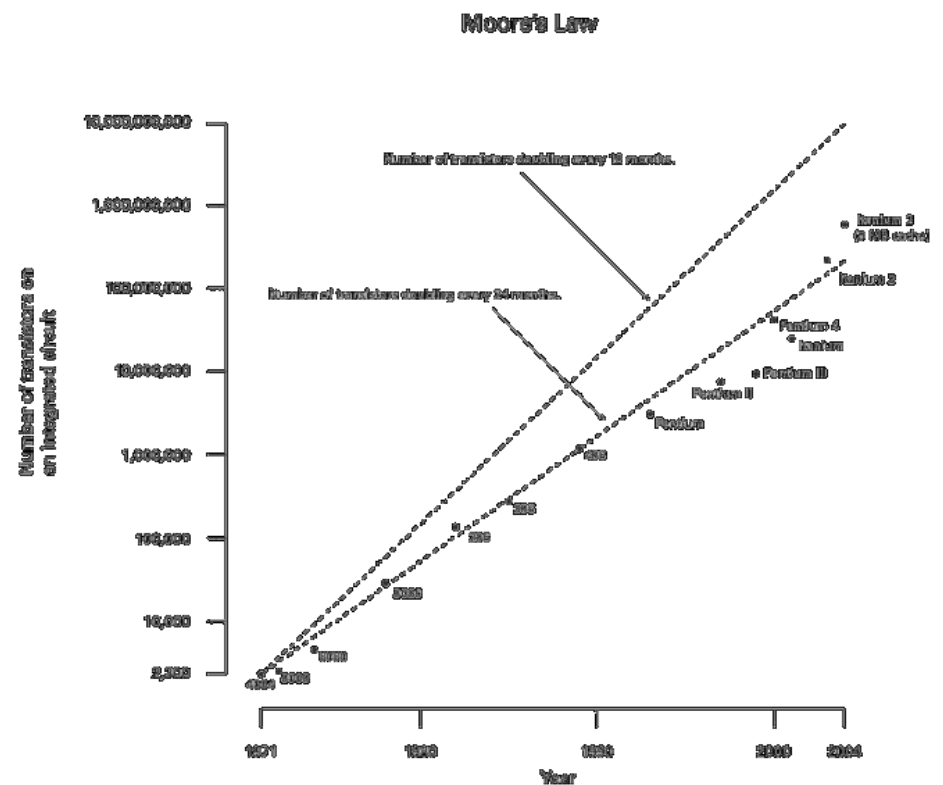
cf. Wigand/Picot/Reichwald (1997)

# Exponential Growth – Typical „Laws“

- Moore's Law
- Metcalf's Law

# Moore's Law

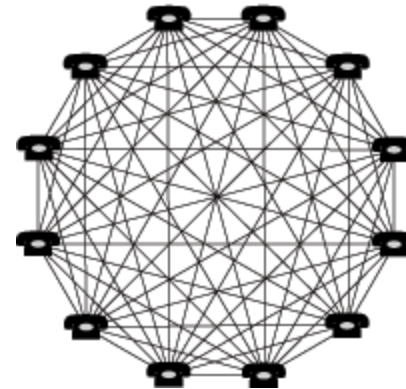
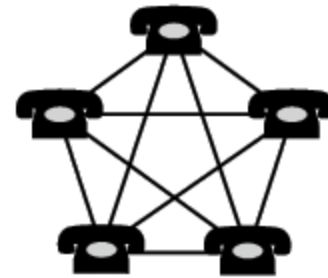
- Empirical observation made in 1965 that the number of transistors on an integrated circuit for minimum component cost **doubles** every 24 months



cf. Wikipedia

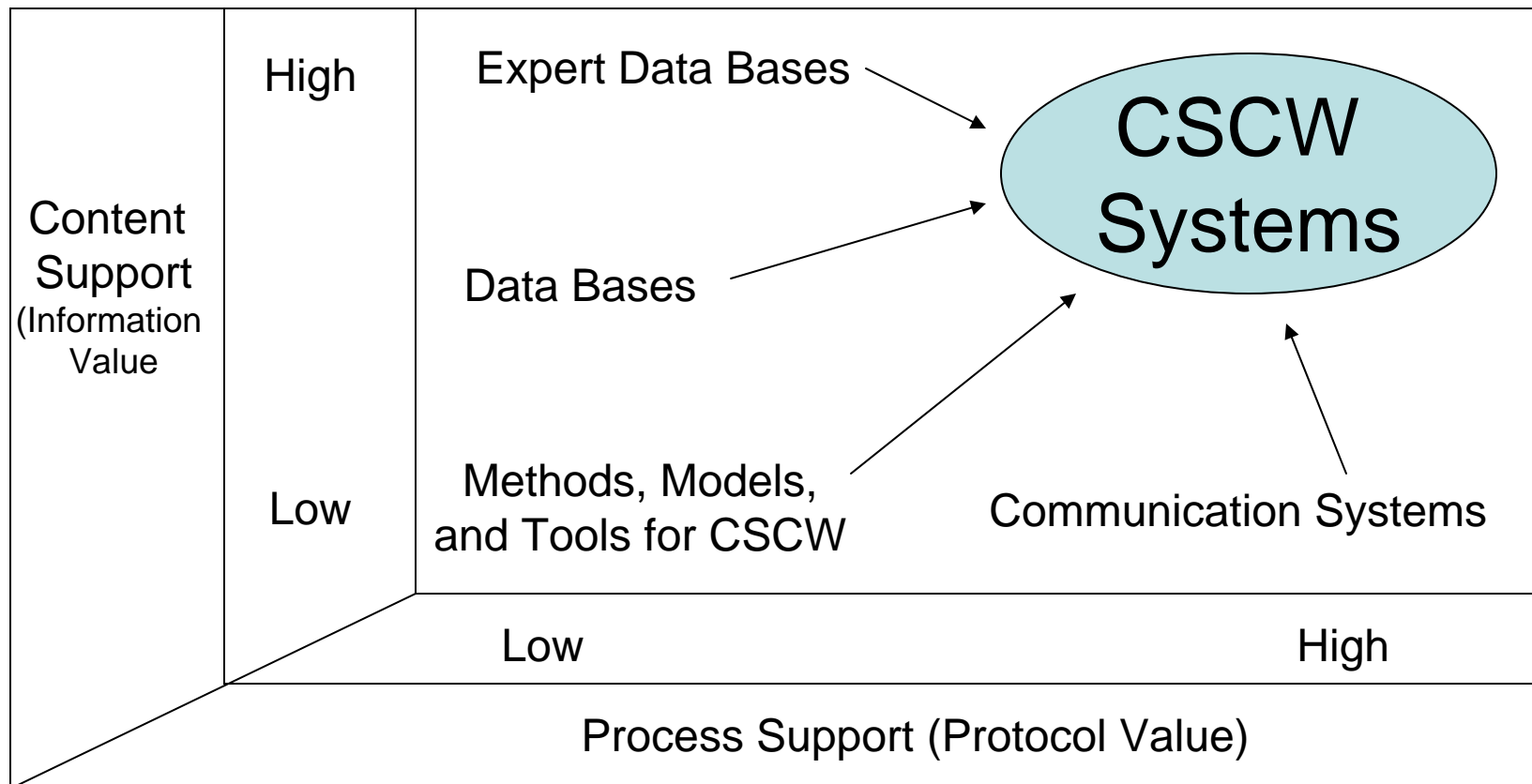
# Metcalfe's Law

- The value of a telecommunications network is proportional to the square of the number of users of the system ( $n^2$ ).
- 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

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

# Information Intensity

Information Intensity in the Value Chain	High	<b>Field 1:</b> E.g. multi-stage, complex assembly processes	<b>Field 2:</b> E.g. Systems Business
	Low	<b>Field 3:</b> E.g. simple telework processing	<b>Field 4:</b> E.g. (simple) consulting
		Low	High
Information Intensity in Performance			

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 specification of interfaces, services, and formats for the assurance of interoperability and portability of applications, data, and people.“

cf. Wigand/Picot/Reichwald (1997)

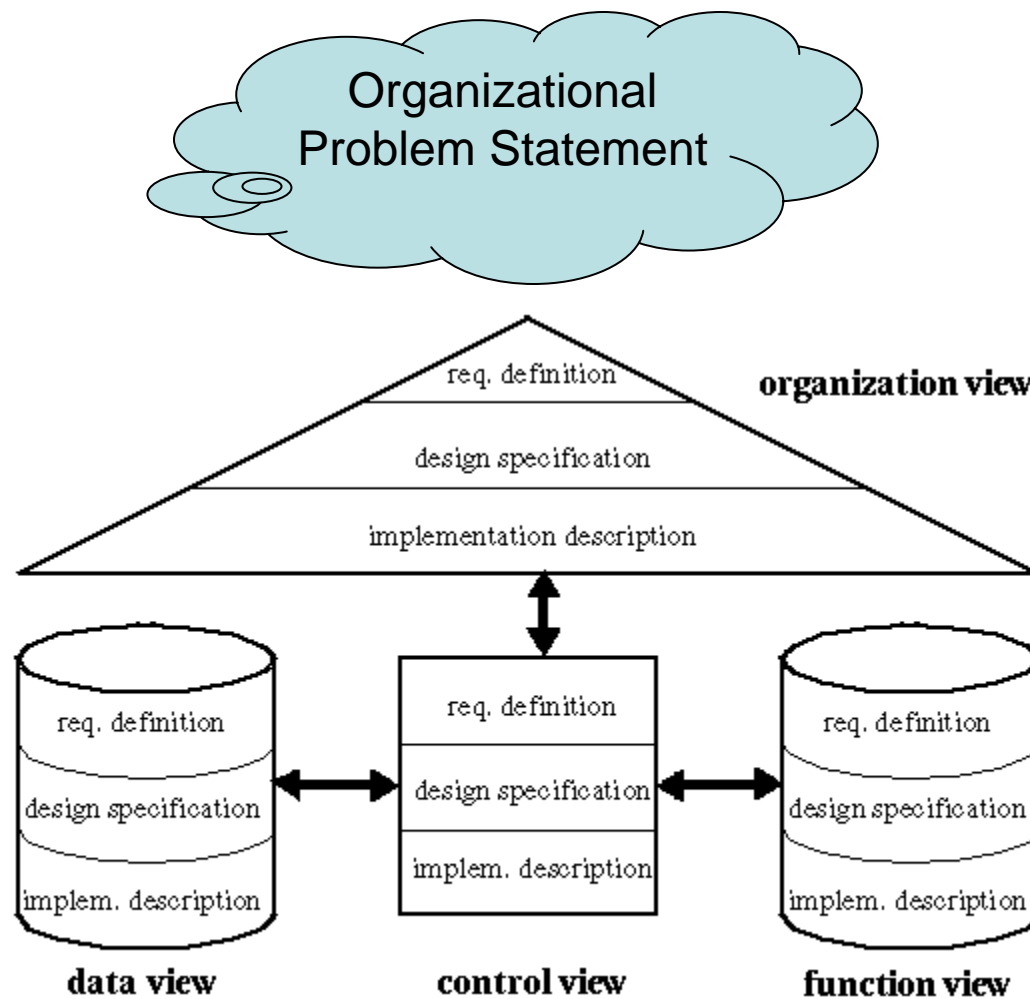
# Globalization

- 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)

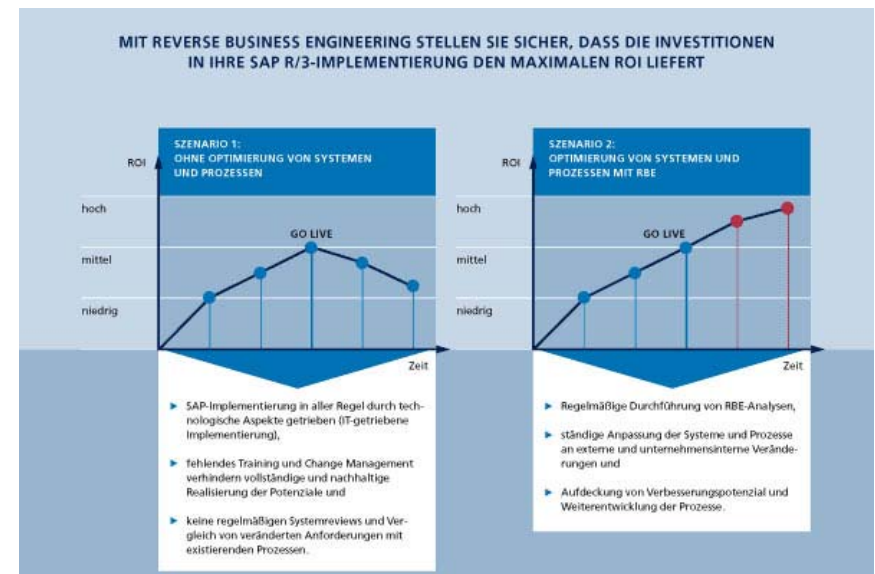
# Common-Of-The-Shelf Business Software vs. Development

- 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.

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