

Institute of Information Management



University of St.Gallen

# Relevant Rigour – Rigorous Relevance

Keynote at ACIS 2007, USQ

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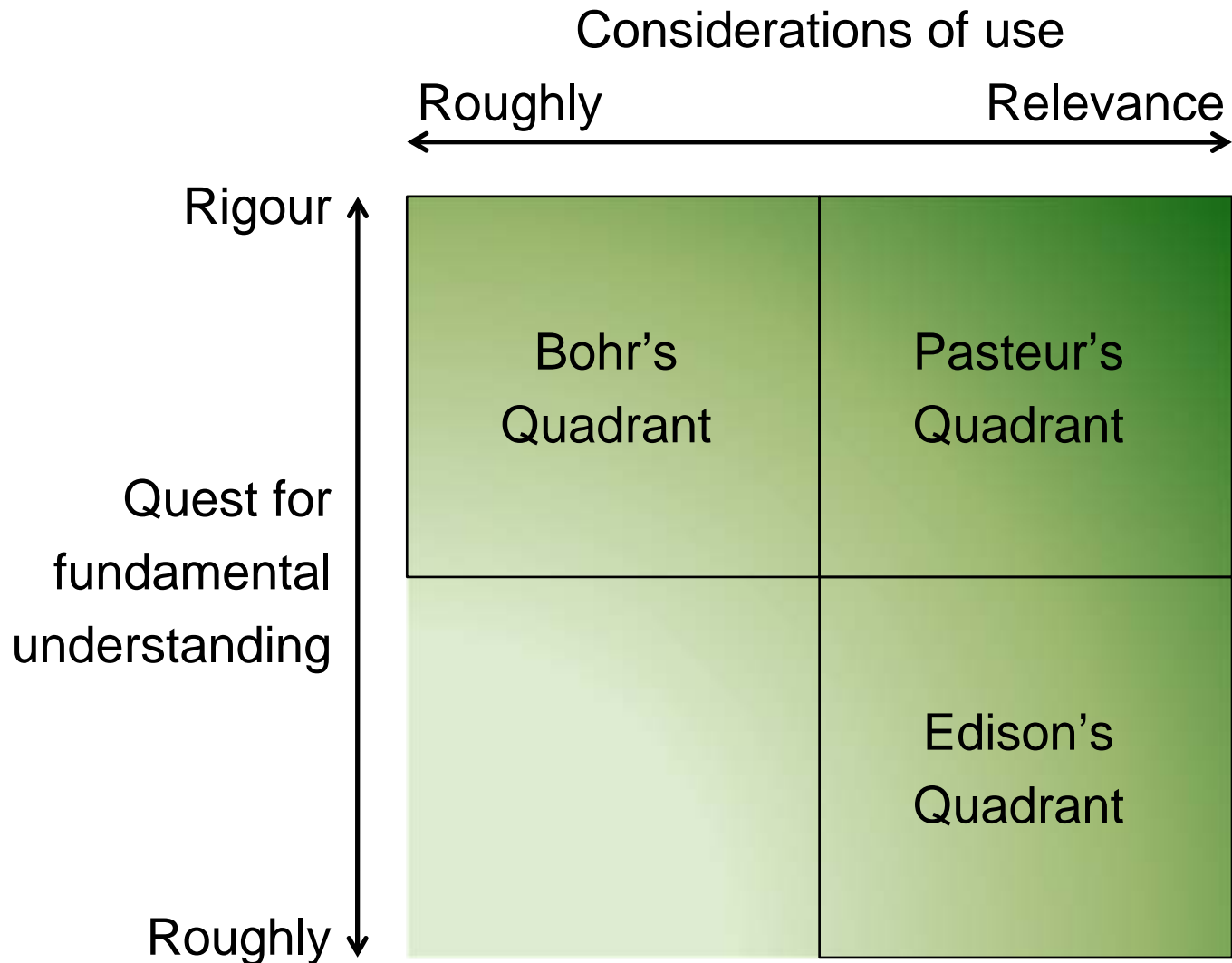
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# Overview

- Stokes' Rigour vs. Relevance Matrix
- Community Statements vs. Community Action
- Artefact Oriented IS Research – Closing the Gap Between Theory Building and Solution Engineering
- Towards a Design Research Process Model
- Successful Examples from a Successful Community
  - Adaptable and Configurable Reference Models
  - Situational Methods
- Consequences for Teaching IS Research
- Consequences for Organizing IS Research

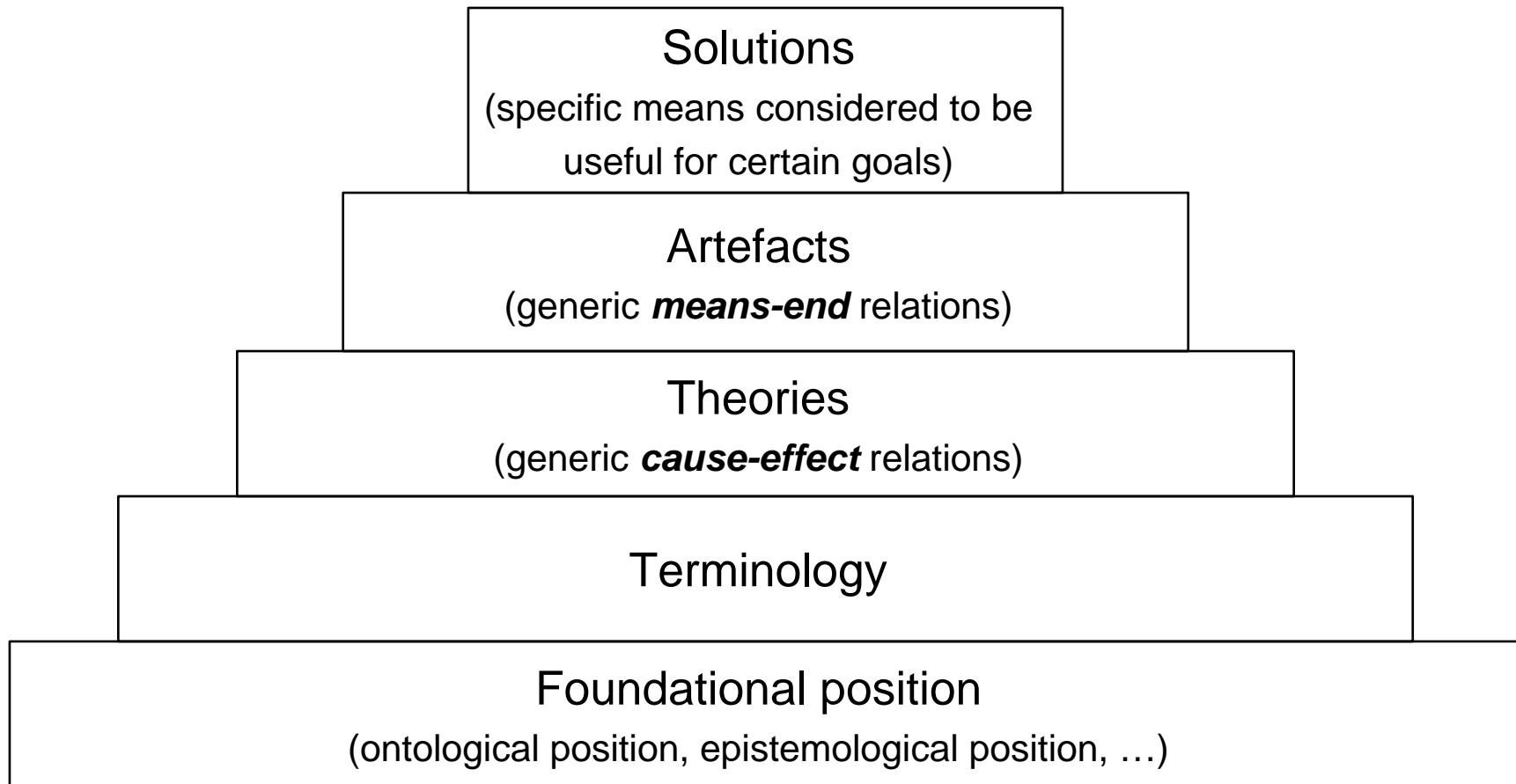
# Stokes' Rigour vs. Relevance Matrix



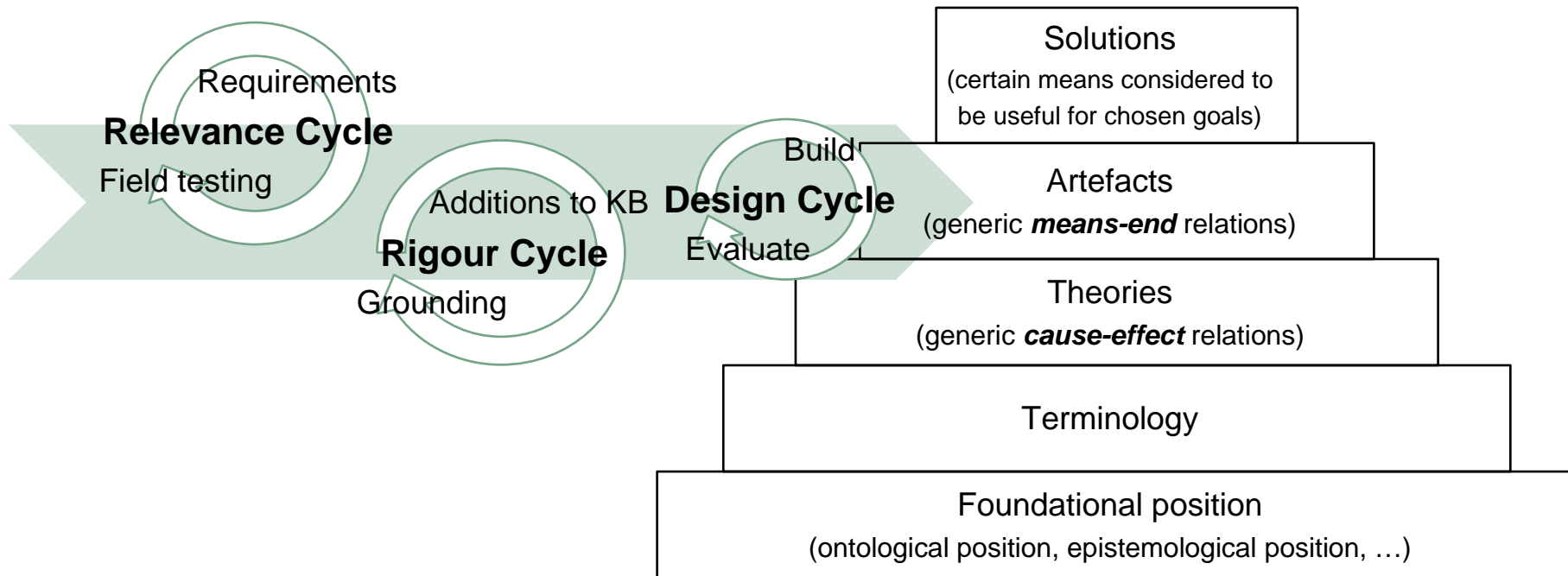
# Community Statements vs. Community Action

- “If a field, especially an applied field like IS, does not study topics that have some promise of applicability to practice (relevance), it is unlikely to be funded or listened to.” [Venable 2007] (the same holds for rigour)
- “Only those, who have interacted with the research subject – IT artefacts and those who use them in practice – will be able to discover and evaluate general patterns of understanding” [Frank 2007]
- Standardized coefficients (Beta) of review category on overall evaluation (ECIS 2007, based on 582 paper evaluations)\*
  1. Significance/contribution: **.360**
  2. Methodology used: **.215**
  3. Theoretical strength: **.156**
  4. Presentation: **.143**
  5. Appeal to audience: **.113**
  6. Relevance: **.064**

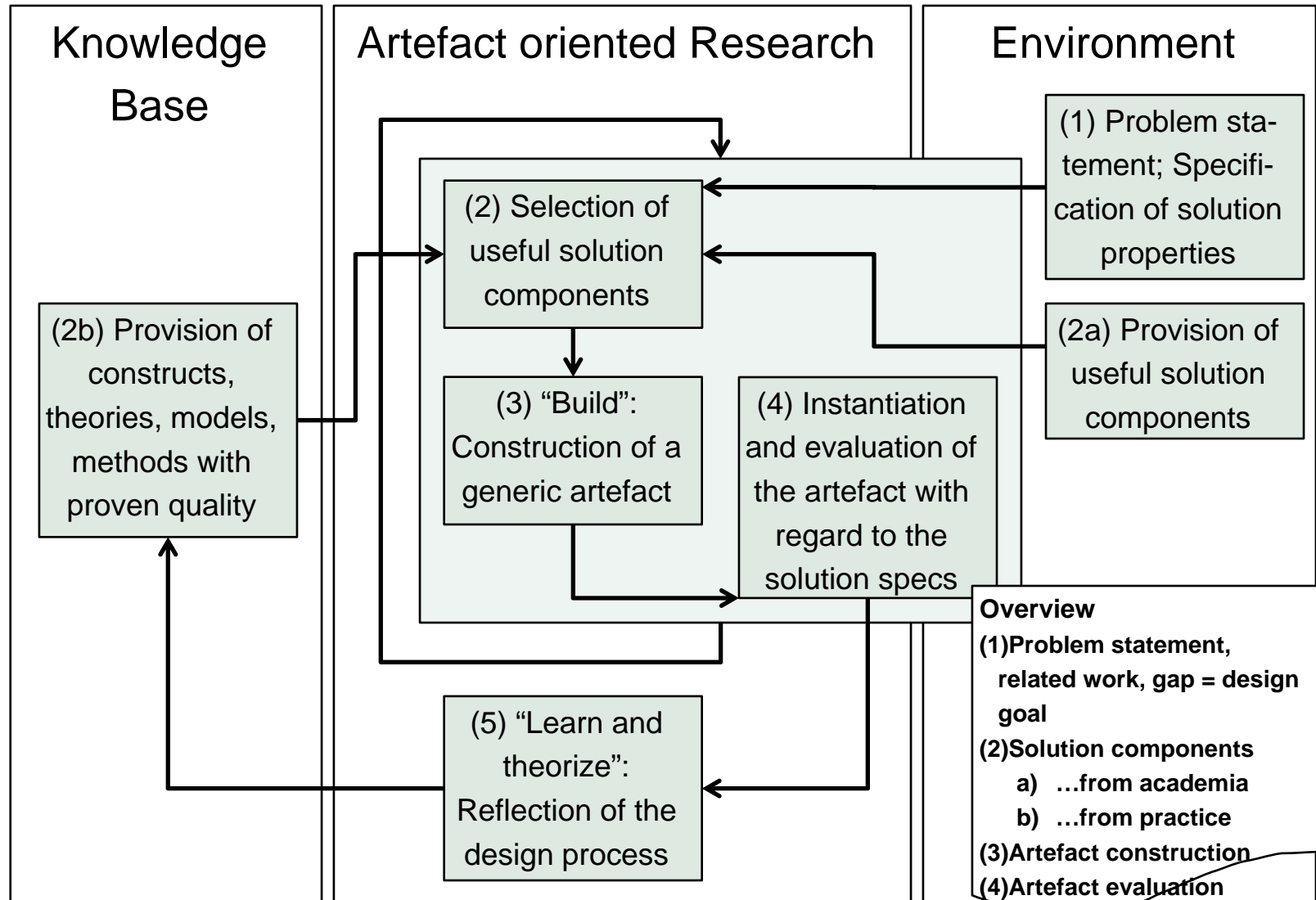
# Artefact Oriented IS Research – Closing the Gap Between Theory Building and Engineering



# The Artefact Design Research Process is Comprised of Three Feedback Cycles



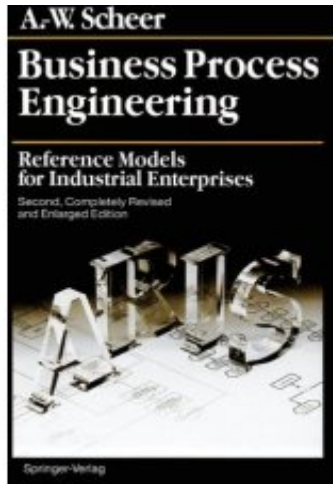
# Towards a Design Research Process Model



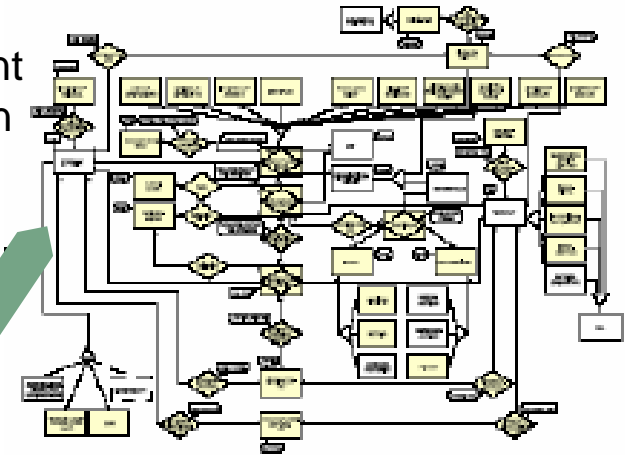
**Overview**  
 (1) Problem statement, related work, gap = design goal  
 (2) Solution components  
 a) ...from academia  
 b) ...from practice  
 (3) Artefact construction  
 (4) Artefact evaluation  
 (5) Conclusions

# Successful Examples (1)

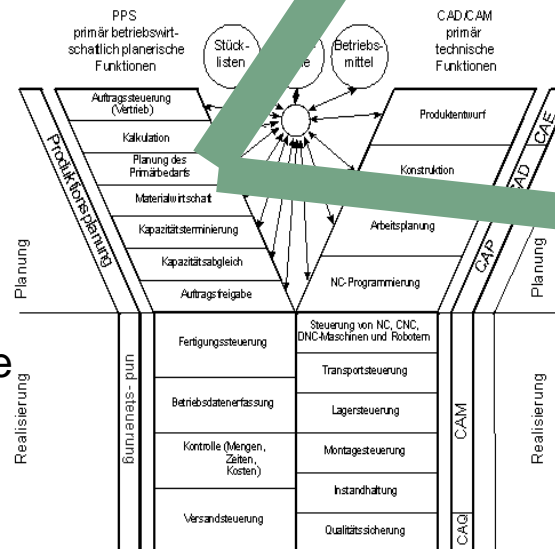
## 1993/1994: Reference Models for Industrial Enterprises Proposed



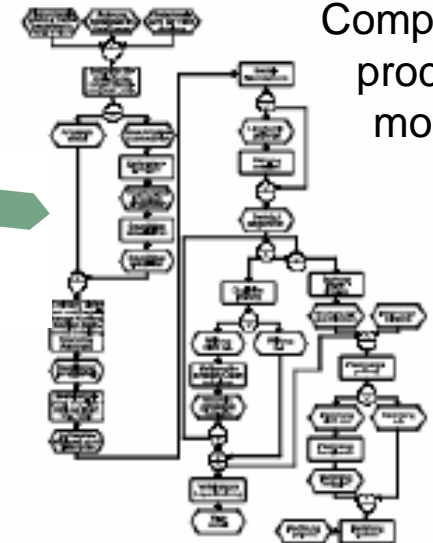
Component information model



Overall functional architecture

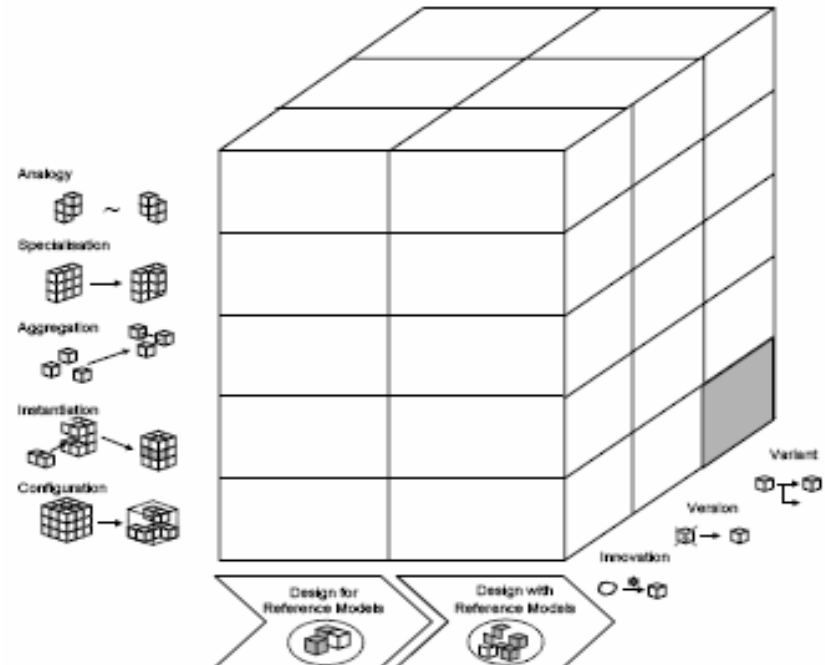
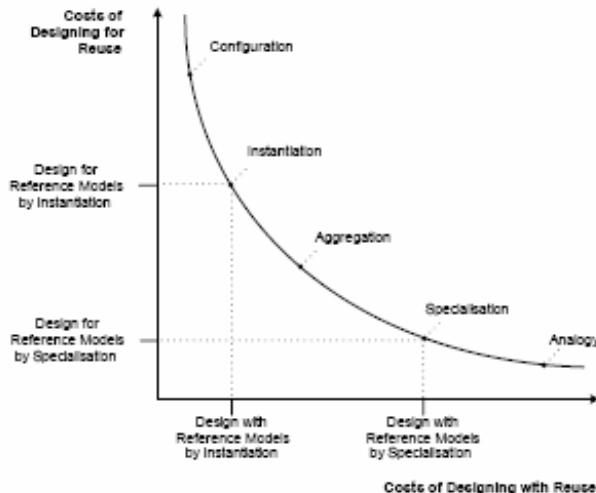
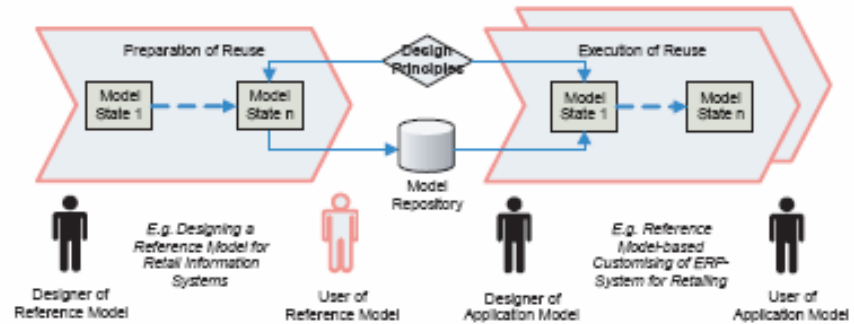
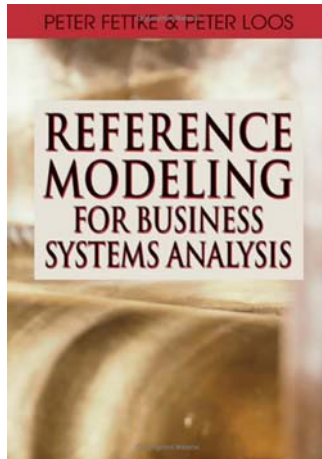


Component process model



# Successful Examples (1)

## 2007: Adaptation and Configuration Mechanisms Understood



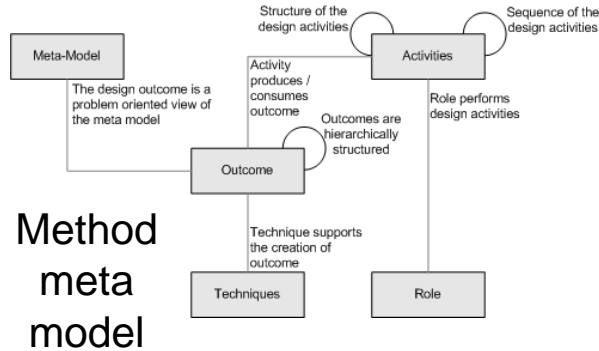
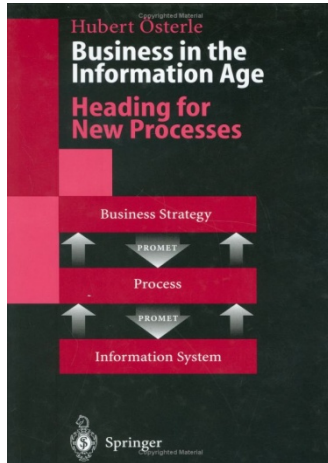
# Successful Examples (1)

## Achievements and Challenges

- Software vendors and software developing companies understand value of reference models
- Reference modelling established as sub-discipline of IS research (accepted quality guidelines, meta models, modelling mechanisms)
- First “open model” initiatives
  
- Reference process models vs. reference information models vs. reference procedure models vs. ...
- Reference modelling vs. method engineering vs. ontology development vs. software engineering

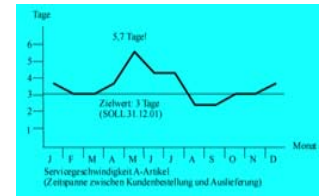
# Successful Examples (2)

## 1995: Comprehensive BPR Methods Proposed



Method meta model

Führungsgöße	Einheit	Soll			
		31.12.02	31.12.03	31.12.04	
Neukunden	Anzahl Neukunden / Monat	-	200	300	150
Unbefriedigte Anfragen	Anzahl unbefr. Ank. / Tag	128	100	75	50
Durchschnittliche Abwicklungskosten pro Auftrag	Ch-F	1.20	0.90	0.80	0.70
Kannnutzung Aufträge	%	400	300	200	200
Auftragskanal Filiale		-	100	150	200
Auftragskanal online		-	-	-	-



Process design documents

Process efficiency

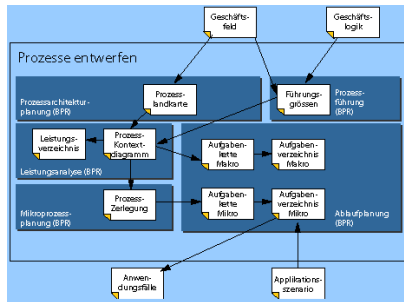
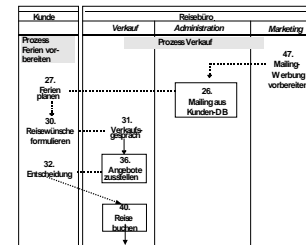
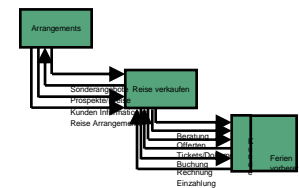
- CSF model
- KPI model

Process effectiveness

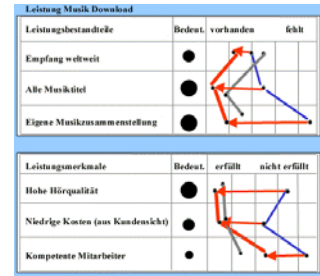
- Context model
- Output specs
- Quality profile

Process design

- Task dependencies
- Task specs
- Responsibility / job specs



Overall procedure model



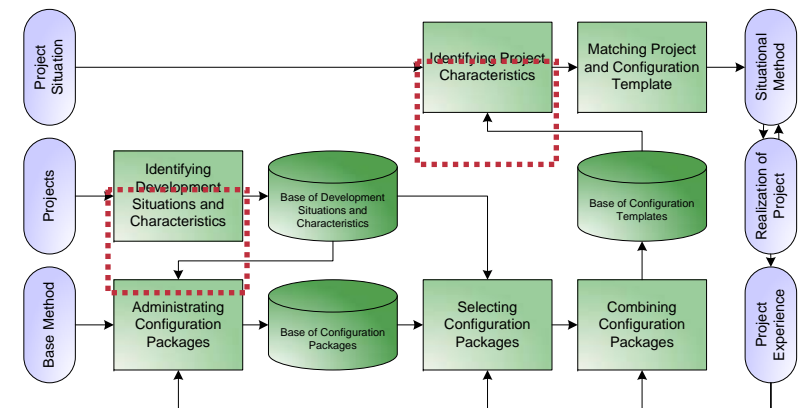
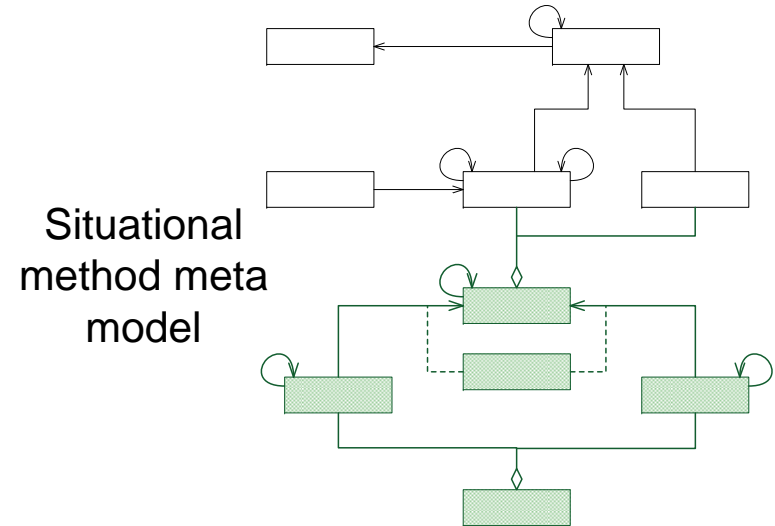
# Successful Examples (2)

## 2007: Situational Adaptation / Configuration Mechanisms Understood



	Project Type A	Project Type B	Project Type C	Project Type ...	
Context a	Situation 1	Situation 2		Situation ...	
Context b		Situation 3		Situation ...	
Context c		Situation 4			
Context ...		Situation ...		Situation ...	

Situation = context type X project type



Method configuration procedure model

# Successful Examples (2)

## Achievements and Challenges

- Convergence of method understanding (product view & process view, method components)
- Method engineering established as sub-discipline of ISD research (accepted quality guidelines, meta models, modelling mechanisms)
- Consultancies and companies increasingly applying methods for scalable, transparent, systematic solution engineering
- Common understanding of project types and context types (situations)
- Systematic reuse of method components
- Standardization of method adaptation / configuration
- Method engineering vs. reference modelling vs. ontology development vs. software engineering

# Consequences for Teaching IS Research

- Multiple methods
  - Conceptual and formal modelling (e. g. schema integration / manipulation)
  - Artefact construction (e. g. reference modelling and method engineering)
  - Case analysis
  - Multi-perspective evaluation (e. g. deployment evaluation, engineering evaluation, economic evaluation, epistemological evaluation [Frank 2007a])
  - ...in addition to behavioural science methods [optional] (e. g. classification methods)
- Example: the new Ph.D. in Business Innovation Programme at St. Gallen

# Consequences for Organizing IS Research

- Project consortia instead of 1:1 projects
  - Usually, a single project partner cannot evaluate the artefact completely
  - Multiple evaluations add value to the artefact for practice as well as for academia
  - Forming and keeping together consortia is challenging
- Critical mass is necessary to maintain industry relationships
  - Industry needs change faster than research agendas
  - Industry interested in one-stop research partnerships
- Example: Business Engineering research programme at St. Gallen
  - 13 professors / post-docs, 70 researchers (= Ph.D. students)
  - Long-lasting corporate relationships (some since 1989)
  - Funding structure reflected in governance structures (advisory board, research council, project steering committees mostly comprised of corporate executives)

# Summary...

## ...and Discussion

- By artefact oriented research, both relevance and rigour can be achieved
- A reference process for artefact oriented research is emerging
- Artefact oriented research has been very successful in the German speaking countries (and others)
- Artefact oriented research creates benefits for both academia and industry (political dimension)
- However, IS research education and particularly IS research organization have to be adapted from traditional models in order to support artefact oriented research

# References

- Bucher, T., Klesse, M., Kurpjuweit, S., Winter, R., Situational Method Engineering - On the Differentiation of "Context" and "Project Type". In Ralyté, J., Brinkkemper, S., Henderson-Sellers, B. (Eds.): Situational Method Engineering - Fundamentals and Experiences, Springer, Boston, 2007, 33-48
- Chmielewicz, K., Forschungskonzeptionen der Wirtschaftswissenschaft, 3<sup>rd</sup> ed., Schäfer-Poeschel, Stuttgart, 1994
- Frank, U., Evaluation of Reference Models, in: Fettke, P., Loos, P. (Eds.), Reference Modeling for Business Systems Analysis, Idea Group, 2007a, 118-140
- Frank, U.: Relevance of Research Implies Relevance to Researchers, Wirtschaftsinformatik, 49 (2007b), 5, 404-405
- Hevner, A.R.: Design Research: Rigorous and Relevant, Keynote at ECIS 2007, St. Gallen 2007a, [www.ecis2007.ch/mod\\_docs/Hevner\\_ECIS\\_Presentation\\_June\\_2007.pdf](http://www.ecis2007.ch/mod_docs/Hevner_ECIS_Presentation_June_2007.pdf)
- Hevner, A.R.: Rigor and Relevance Viewed as a 2x2 Matrix, Wirtschaftsinformatik, 49 (2007b), 5, 406-407
- Karlsson, F., Ågerfalk, P.J., Method Configuration – Adapting to Situational Characteristics while Creating Reusable Assets, Information and Software Technology, 46 (2004), 9, 619-633
- Österle, H., Business in the Information Age - Heading for New Processes, Springer, New York, 1995
- Scheer, A.-W., Business Process Engineering - Reference Models for Industrial Enterprises, Springer, New York, 1994
- Stokes, D.: Pasteur's Quadrant: Basic Science and Technological Innovation, Brookings Institution Press, Washington DC, 1997
- Venable, J.R.: Relevance vs. Rigour or Relevance *and* Rigour? Contingence and Invariance in Standards for IS Research, Wirtschaftsinformatik, 49 (2007b), 5, 407-409
- vom Brocke, J.: Design Principles for Reference Modeling - Reusing Information Models by Means of Aggregation, Specialization, Instantiation, and Analogy, in: Fettke, P., Loos, P. (Eds.), Reference Modeling for Business Systems Analysis, Idea Group, 2007, 47-75