Understanding
Systems Development in Practice:
The Enactment of Methodology
—
The Case of
Developing a MultiMedia Information System
Karlheinz Kautz
Copenhagen Business School
Department of Informatics

Introductory Remarks on IS Research
• Information systems are a socio-technical phenomenon
• The spectrum in IS research reaches from
design-oriented to socio-theoretical approaches
• My interest here is in systems development informed by knowledge
management, quality management (software process improvement) and the
adoption and diffusion of IT-related process and product innovations
• My focus therein is on systems development (and design), but not on products
(artefacts), but the process:
• Systems development as a socio-technical phenomenon can be approached
with socio-theoretical approaches and research methods
(f.ex. Structuration Theory or Actor Network Theory or …)
(f.ex. Action case, Case study, Action research, Collaborative research)

Background I
• Research on ISD methodologies suggests a disparity between the
way methods are formally described and the way in which systems
are developed in practice.
• Empirical studies found that in practice methodologies are used in a
pragmatic way resulting in a unique instantiation for each
development project (Stolterman 1992; Bansler and Bødker 1993;
Stolterman 1994; Fitzgerald 1997; Fitzgerald, 1998; Madsen and
• Truex et al. (2000) argue that the assumptions underlying the
concept of ISD methodologies must be addressed: they question that
ISD is a manageable, linear, repeatable and rational process and
propose an alternative set of amethodical assumptions.
• Pettigrew (1987) argues that there are few studies that allow the
change process to reveal itself in any kind of substantially tem-
poral or contextual manner; research is largely ahistorical, acontextual, and
aprocessual in nature.

Method
• The research is based on a project, which aimed at delivering a
service to a customer, but the study of methodology enactment was
not part of the original assignment.
• The author participated in the development team as overall project
leader, analyst and designer and documented the development
process in several ways.
• Minutes were taken from all meetings and shared with all involved.
• In addition to product documentation, data was collected in the form
of the researcher’s diary as well as statements from email and
informal conversations.
• The project contract, the 3 official bi-annual project progress reports
and the final project report were available for study.
• The research method applied can be characterised as action case
research (Braa & Vidgen 1999).

Background II
• This is also true for the field of ISD methodologies, only limited
detailed empirical documentation and research have addressed
the issue of an actual methodology emerges in practice
— Wynkoop & Russo (1997) request more field research about systems
development in practice and
— Robey (1995) and Mathiassen (1998) propose structuration theory as a
comprehensive framework with its key components of structure and
interaction process to get a deeper understanding of systems
development and to develop sustainable theories hereof.
• Vidgen et al (2004) provide a historical account of the
dynamics of methodology enactment in a development project
that lasted 2 years; however, despite the temporal description,
a conceptual framework for their analysis was not used.
• Fitzgerald et al. (2002) put forward a method-in-action
framework, but treat its components – context, developers,
information system, formalized method, method-in-action, the
roles of method – as merely interdependent structural
elements.

The Framework – Part I
Systems Development as an organisational Innovation

<table>
<thead>
<tr>
<th>Basic Assumption: Methodology is enacted</th>
<th>Individualist</th>
<th>Structuralist</th>
<th>Interactive Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>by individuals</td>
<td>by independent structural characteristics</td>
<td>over time through the interaction between the actions of individuals, structural influences and the methodology itself</td>
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<tr>
<td>Conceptualisation of Methodology (Enactment) as an Innovation</td>
<td>The contents of methodologies is subjectively perceived and constantly reinvented and reconfigured</td>
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<tr>
<td>Conceptualisation of Methodology Enactment as an Innovation Process</td>
<td>Methodology enactment takes place in a complex social process, in which political and cultural aspects play an important role</td>
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### The Framework – Part II:

**Systems Development as an organisational Innovation**

<table>
<thead>
<tr>
<th>Individualist</th>
<th>Structuralist</th>
<th>Interactive Process</th>
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</thead>
<tbody>
<tr>
<td>Core Concepts</td>
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<tr>
<td>Champion</td>
<td></td>
<td>Social Context</td>
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<td>Entrepreneur</td>
<td></td>
<td>Innovative Capability</td>
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<td>Innovator</td>
<td></td>
<td>Proliferation</td>
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<td>Change Agents</td>
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<td>History</td>
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<td>Social Context</td>
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<td>Social Relations</td>
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<td>Crisis and Shocks</td>
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<tr>
<td>Social Relations</td>
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<td>Social Infrastructure</td>
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<tr>
<td>Political perspective</td>
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<td>Cultural perspective</td>
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<tr>
<td>Size</td>
<td>Resources</td>
<td>Centralisation</td>
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<tr>
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<td>Environment</td>
<td>Centralisation</td>
</tr>
<tr>
<td>Resources</td>
<td>Environment</td>
<td></td>
</tr>
</tbody>
</table>

### The Case Setting I

- The purpose of the project was to develop a MultiMedia IS to spread knowledge about SPI and quality management to IT and software managers and professionals.
- The project was based on a joint bid by two European software organisations, one being an IT consultancy, the other an academic organisation, located in Norway and Denmark, respectively.
- The customer was the European Union.

### The Case Setting II

- The project contract was signed on a fixed price basis with a run time of 18 months.
- It included a plan for 616 person days of which 135 were assigned to subcontractors and the remainder was distributed between 3-4 project participants, mainly system developers, from each of the organisations.
- The contract included a plan and a description of the MMIS development methodology:
  - 8 work packages: analysis, design, media – sound video - production, authoring/programming, media - CD – print, dissemination, evaluation and project management
  - 30 activities with the same number of specified deliverables

### The Case Setting III

- The actual project lasted 22 months and used more work days than planned, but stayed within budget.
- According to the specified evaluation criteria it was considered a success,
  - with regard to the product and software quality as judged by two external evaluators and testers
  - and the feedback from end users concerning the accessibility and information quality, which was collected through a survey instrument.
- The enactment of the actual methodology only partially followed the path outlined in the project contract and in the methodology description.
Excerpt from the Resource Monitoring Report after 12 Months

### Environment
- Customer (EU) required building blocks defining the overall methodology
- Contract defined organisation of the development process

### Formalism
- Writing project progress reports
- Defined milestones and deliverables
- Defined Standards

### Professionalism
- Defined methodology
- Project planning, monitoring and reporting

### Size
- Informal communication

### Centralisation
- Flat hierarchy with project leader as the ultimate decision maker to sanction methodology enactment

### Departialisation
- Development of templates and adjusted standards
- Gathering a core team on one physical site

### Differentiation
- Development of templates and adjusted standards

### Resources
- Parallel work on different activities

### Task complexity
- Parallel work on different activities

### Job specialisation
- Reallocation of tasks and resources

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**An Individualist Perspective View on Methodology Enactment**

**Leader(ship)**
- Project manager and methodology author defined the overall methodology
- Project manager and methodology author approved intermediate results
- Project manager produced status reports and initiated action
- Project manager approved the actual enactment

**Champions**
- Principal designer had high skill level, which allowed for exploration and experimentation with methodological aids
- Principal designer and methodology author advocated the establishment of standards and templates
- Principal designer introduced the concrete development techniques

**Change agents**
- Principal designer started parallel work on different work tasks

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**An Interactive Process Perspective on Methodology Enactment**

**Social context**
- Innovativeness and Proclivity
- High capability and proliferation expressed through the development of overall approach and subsequent standardisation and tuning of existing techniques

**History**
- Project leader’s experience with EU projects influenced status discussions and reporting
- EU’s initial decision to cut down the duration, budget and workdays lead to the hiring of young, inexperienced staff

**Social relations**
- Close relations between project manager and methodology author outlined overall approach and their collaboration with the principal designer had an impact on standardisation, tuning of existing techniques, and parallel work

**Social infrastructure**
- IT consultancy and academic team members related mostly to their respective managers in guidance for performing their tasks

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**An Interactive Process Perspective on Methodology Enactment**

**Social process**
- EU was in power of the overall project
- Political perspective
- Project leader had financial control, but had to balance the EU’s requirements with the challenges of the actual course of events
- Distribution of power
- Methodology author controlled the principal designer, and together they dominated project leader and IT consultancy team
- Power relations were expressed through reporting routines and the ways intermediate deliveries were produced

**Cultural perspective**
- Subculture’s and Stakeholder groups interaction
- Open atmosphere brought conflict into the open as a prerequisite for resolution
- Despite different attitudes to professional work of IT consultants and academic personnel open-mindedness enabled compromise

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**Contents**
- Planned methodology:
  - In-house developed, sequential approach
  - Phased project plan with analysis, design, production, programming, evaluation and management activities
  - Supporting software tools
  - Known development techniques
- Enacted methodology (course of the process):
  - From linear, sequential to iterative, evolutionary, adaptive, agile, amethodical, improvised process

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**An Interactive Process Perspective on Methodology Enactment**

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**Excerpt from the Resource Monitoring Report after 12 Months**

<table>
<thead>
<tr>
<th>Task</th>
<th>Report Period 1 (month 1 – 6)</th>
<th>Report Period 2 (month 7 – 12)</th>
<th>Effort used in both periods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual Effort/Revised Plan</td>
<td>Total APIT</td>
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<td></td>
<td>Orig.</td>
<td>Total</td>
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</table>

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**A Structuralist Perspective View on Methodology Enactment**

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Conclusion

• The description and discussion show
  – the role and usefulness of methodologies as a means for communication, coordination and (re)direction,
  – like sketchy maps and plans and less as a rigorous and rigid means for control.

• Our work is a contribution towards a redefinition of the concept of methodology, but against the abandonment of the concept