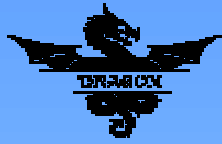


The M.A.D. Experience

Multiperspective application development in
evolutionary prototyping

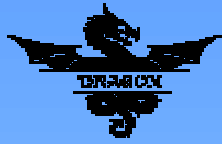
Michael Christensen, Andy Crabtree, Christian Heide Damm, Klaus Marius Hansen, Ole Lehrmann Madsen,
Pernille Marquardsen, Preben Mogensen, Elmer Sandvad, Lennert Sloth, Michael Thomsen

University of Aarhus



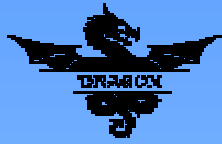
Outline of Presentation

- The Dragon Project
 - Settings
 - Major Challenges
- The Process
 - Experimentation
 - Tools
 - Going Out
 - Actual Work
 - Object Modelling
 - Multiple Competencies
- Lessons Learned



Settings

- **Duration**
 - March 1997 - July 1998 - ...
 - Prototype appraised and approved by the company's highest executive body in May and 5 major iterations
 - Prototype major requirements specification for production system
- **Partners**
 - A globally distributed shipping company
 - The DEVISE research group at Aarhus university
 - Participatory design
 - Object-orientation
- **Development group**
 - Ethnography, participatory design, object-orientation, usability
- **Objectives**
 - Business: prototype for a global booking system
 - Research: experiences with tools, techniques and approaches developed by DEVISE



Major Challenges

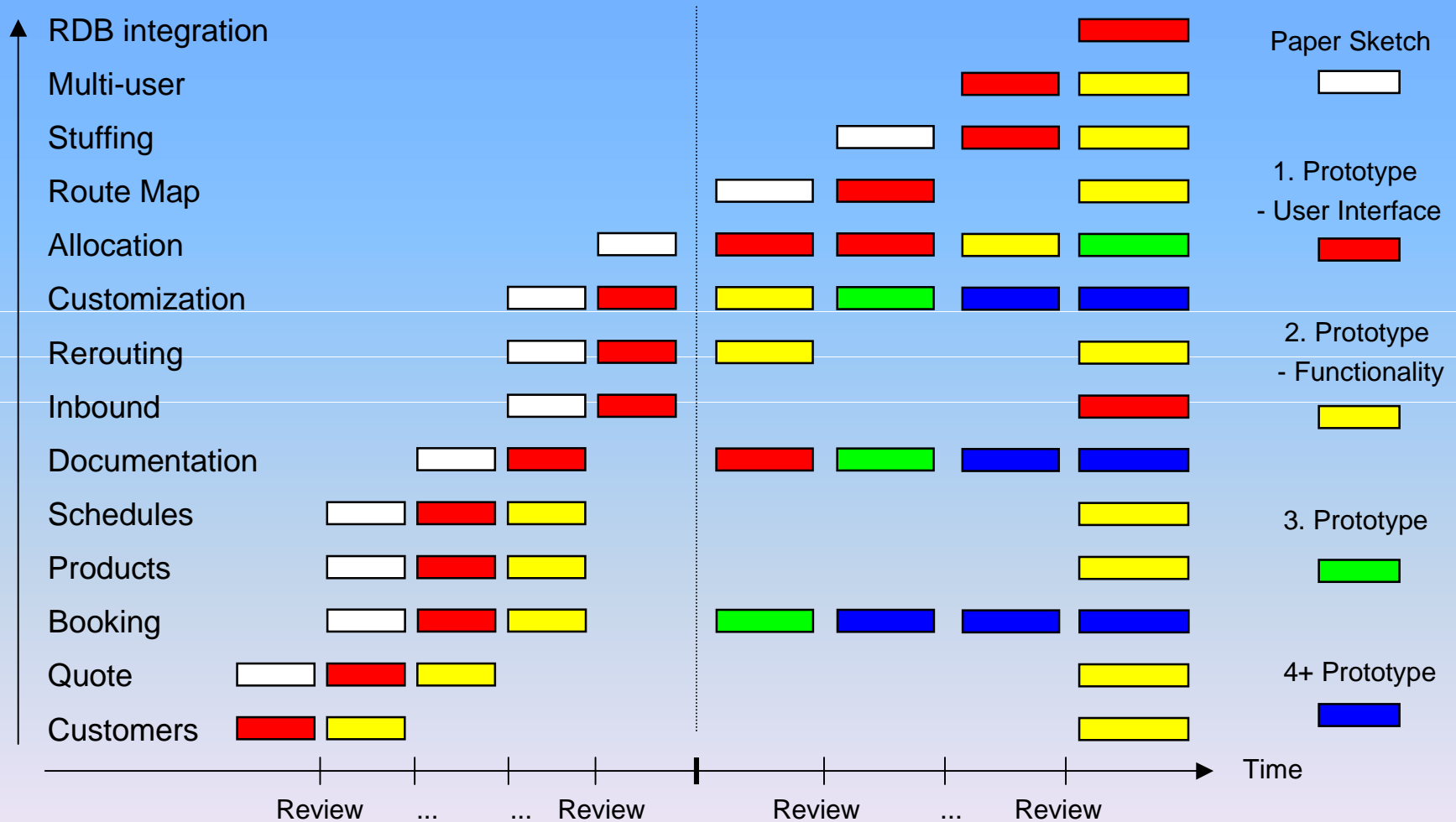
The global booking system should

- Replace several old systems
 - Currently 50+ individual systems
 - Several local variants of systems
- Coordinate distributed work
 - Customer service should be world wide and coordinated
- Respect local needs
 - The process of booking in Singapore is *not* the process of booking in Hamburg



The Process

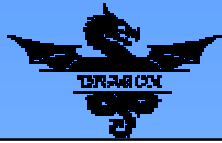
Concerns



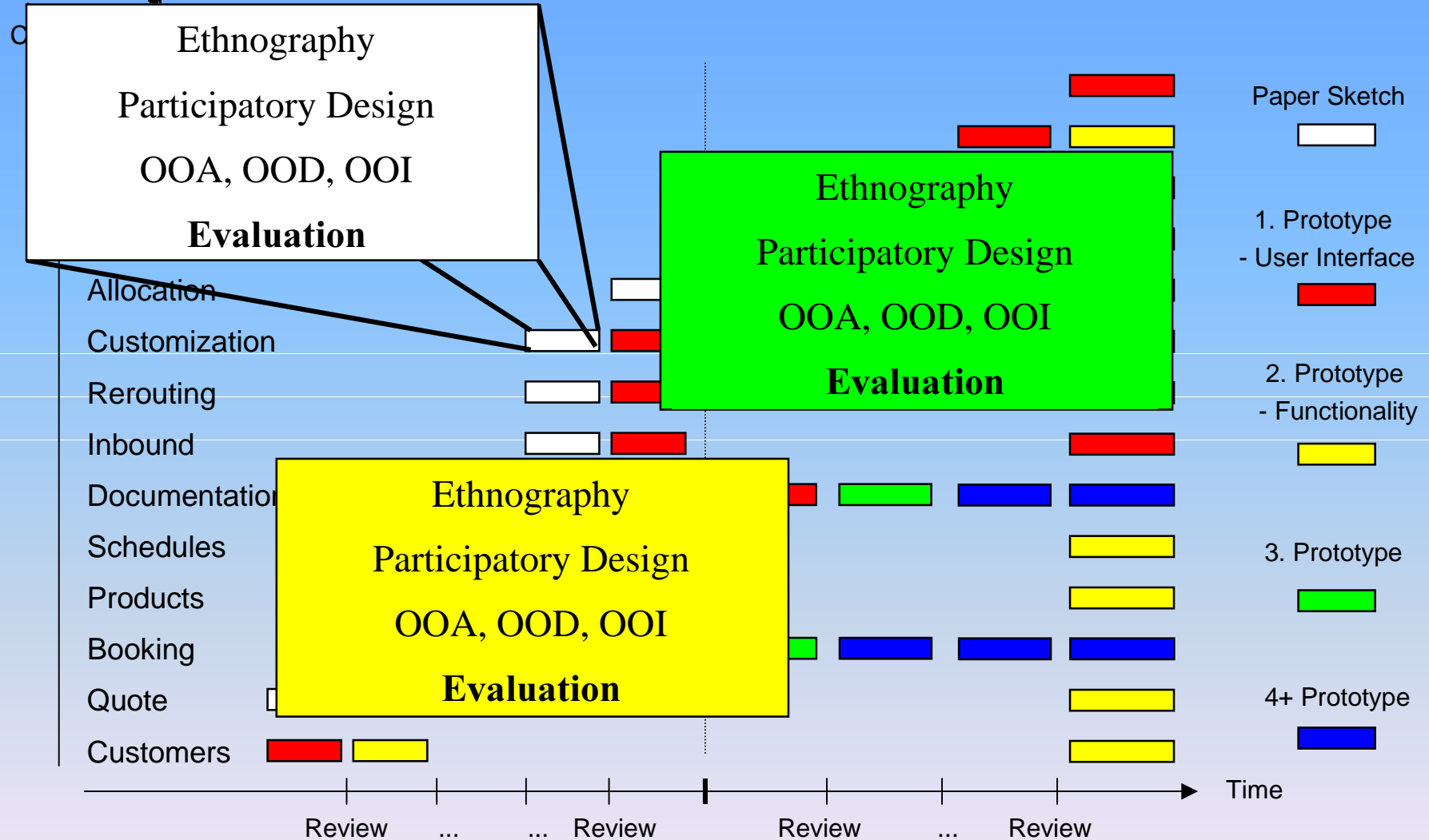
July 17, 1998

The M.A.D. Experience

Klaus Marius Hansen



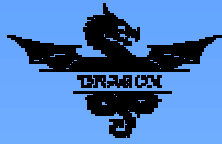
The Process



July 17, 1998

The M.A.D. Experience

Klaus Marius Hansen



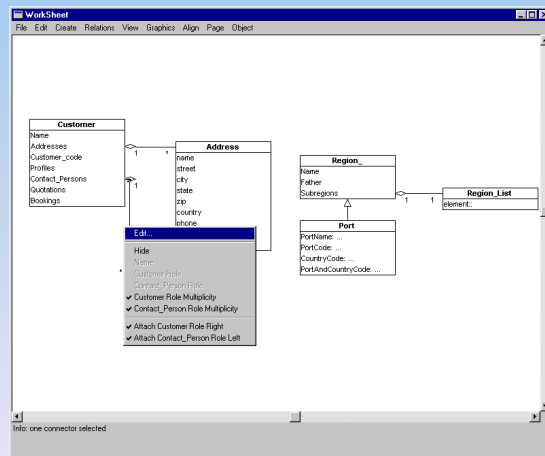
Experimentation

- Is *performance* of development in *active collaboration* with users
- Concretises visions of the future through e.g. Prototype
- Radical parallelism yet evolution towards product system
 - Code from day one - still analysis
 - Need for flexibility and robustness of prototype
 - Need for tool-support

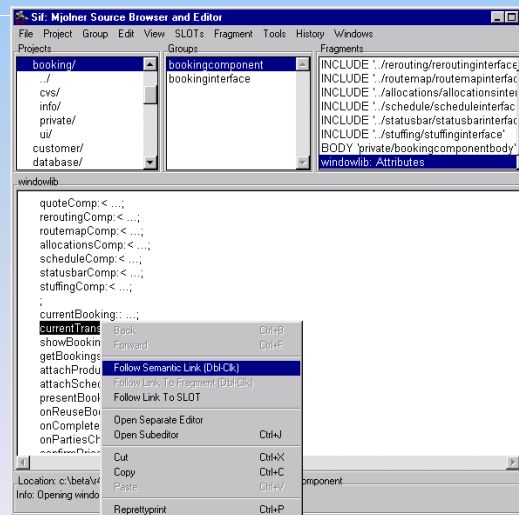


Tools

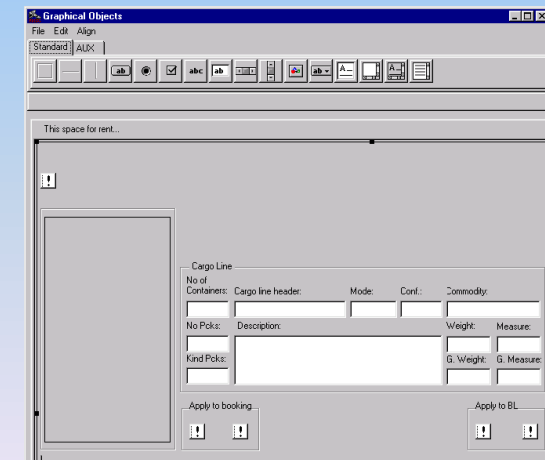
- Support for many iterations over short time
- Reengineering capabilities crucial
- The BETA language and the Mjølner System:
 - CASE tool
 - UML notation, incremental code generation
 - Model changes mostly in code editor, diagrams reengineered
 - Code editor
 - abstract overview, semantic links
 - crucial in restructuring the prototype
 - GUI builder
 - interface created from start, used for discussions also
 - coordinating between OO-developers and participatory designer



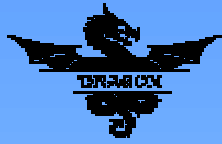
July 17, 1998



The M.A.D. Experience



Klaus Marius Hansen



Going Out

Thursday:

4 developers and 2 business representatives arrive in Singapore

Friday:

(Morning) presentation of the prototype to some 20 people

(Afternoon) developers join various people doing usual work

Saturday:

(Morning) workshop with 4 people centred on booking

(Afternoon) lessons learned & implementation/redesign decisions

Monday:

Ethnographer focuses on allocation and pricing

Participatory designer makes hands-on session with 3 users

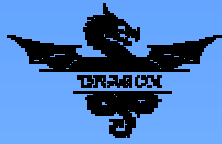
OO-developers implement proposed changes

Tuesday:

Presentation of changes & details on next issues on agenda for prototype

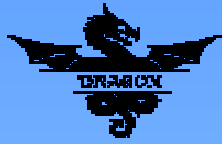
Wednesday:

4 developers and 2 business representatives arrive in Malaysia



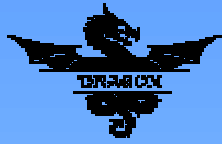
Coming Home

- Actual implementation of two major components started
- Developers experienced actual work in Asia
- Asia experienced the prototype



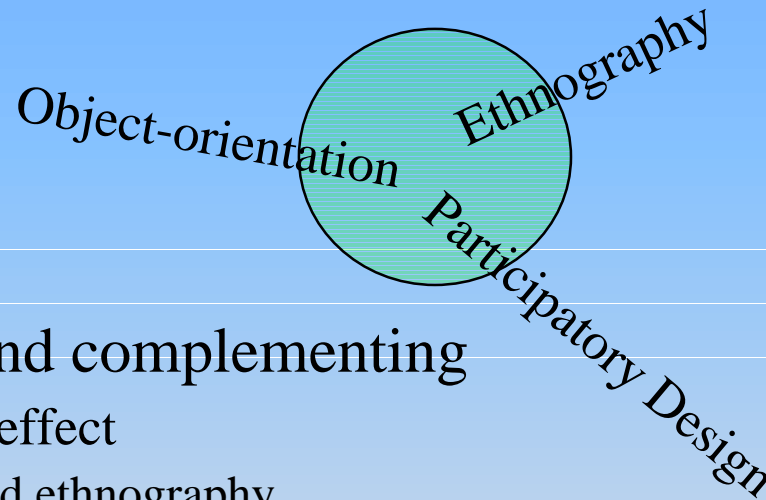
Actual Work

- System design *is* work design
 - System design must be based on an understanding of actual work
 - Ethnography, workshops, evaluation of prototype used to make actual work in details visible to developers
 - Ethnographer is not “proxy user”
- Bring users into development *and* developers to users
- Effective design bridges between current and future work
 - Subject of analysis, springboard for design and goal of implementation
- Prototypes, mock-ups, scenarios, object modelling complement understanding through ethnography

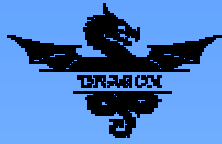


Multiple Competencies

- Use of diverse competencies

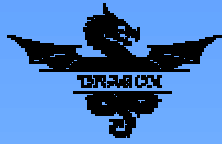


- Interacting and complementing
 - Synergetic effect
 - OOA and ethnography
 - Participatory design and ethnography
 - OOD and participatory design
 - No strict separation
 - Actual work and prototype as common frame of reference



Lessons Learned

- *OO-analysis is more than finding nouns and verbs*
 - Analysis is directed towards understanding of current work
 - Ethnography and participatory design provides a concrete understanding of actual work
 - Developers need concrete experiences from actual work
- *OO-design is more than filling in details in the object-oriented analysis model*
 - Participatory design provides concrete design visions through experimentation
 - Design needs to find “best matches” between current and future work
- *OO-implementation is more than translating design models into code*
 - Starts early - design visions *will* change
 - Implementation is the implementation of emerging design visions
- *Principles does not apply to all problems in all situations*
 - Approach applied successfully in the concrete settings: complex human work, high uncertainty, large and geographically distributed organisation



Pointers - So Far ...

The DEVISE research group at Aarhus University

<http://www.daimi.aau.dk/DEVISE/>

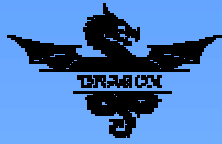
Crabtree, A., Mogensen, P. *The Relevance of Specifics and the Specifics of Relevance*, in preparation

Crabtree, A. *Ethnography in Participatory Design*, accepted for PDC'98

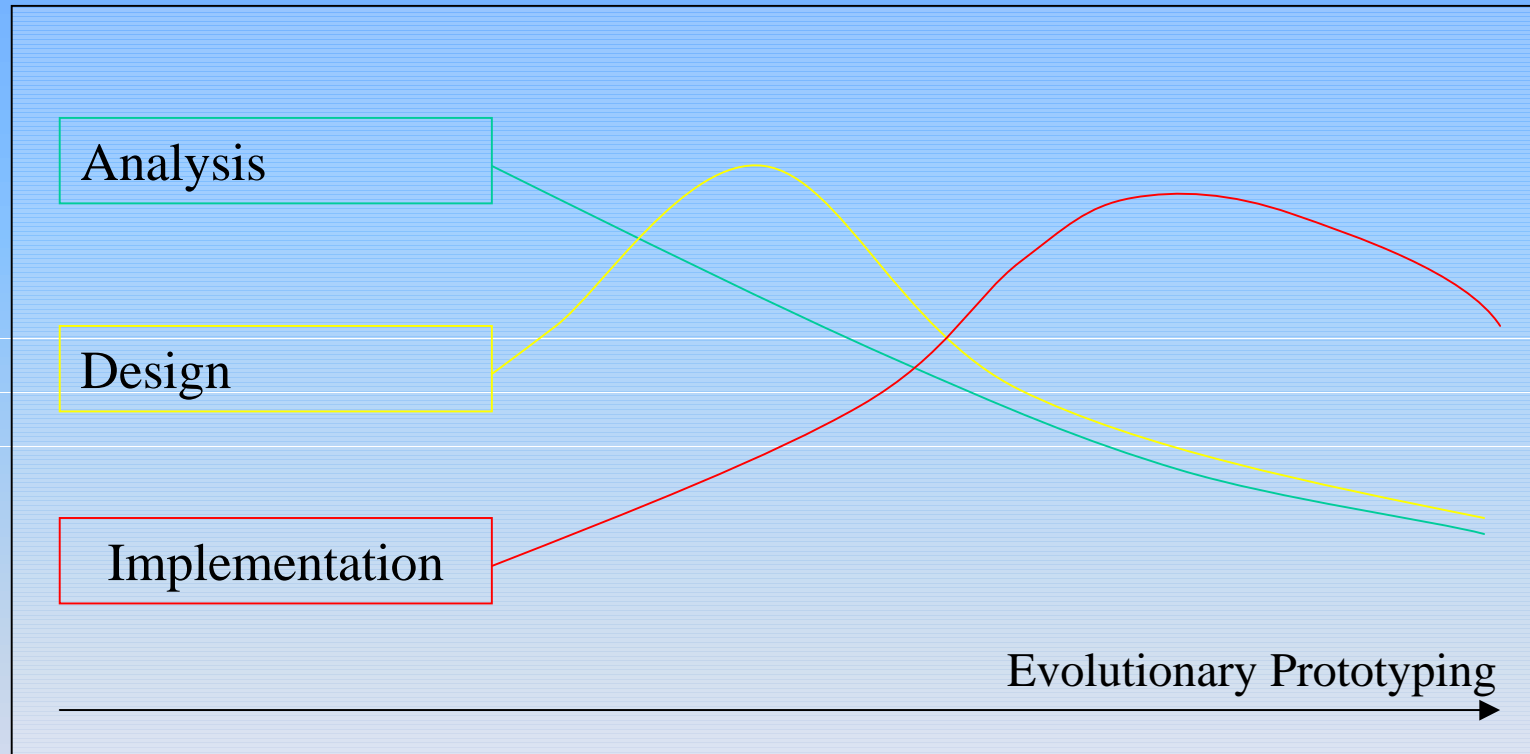
Christensen, M., Damm, C.H., Hansen, K.H., Sandvad, E., Thomsen, M. *Architectures of Prototypes and Architectural Prototyping - The Dragon Experience*, accepted for NWPER'98

Funded by the Danish national Centre for IT-research

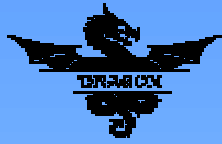
<http://www.cit.dk>



Concerns

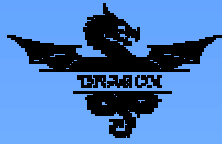


Movement of concerns of evolutionary prototyping implementation

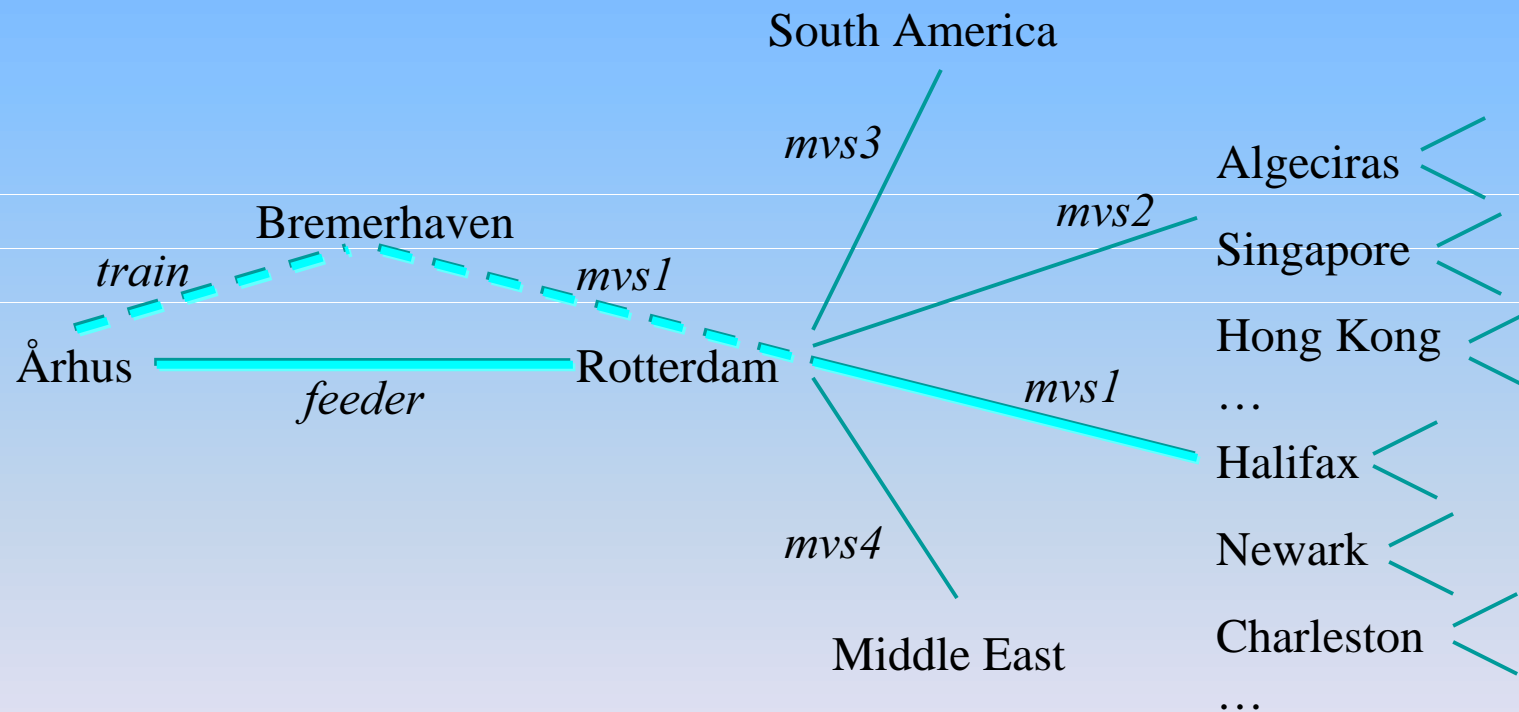


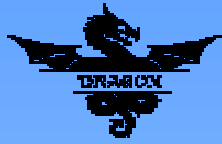
Work Instances

- Real world instance of actual work
 - E.g. “rerouting”
 - Ethnographer collect examples, participatory designer comes up with visions, developers reiterates
 - Does not focus on how to perform the work in a final system
- Used and reproduced within development group, presentations, workshops, usability studies, ...
- Does not capture all possible problems - not a final design solution
 - Compact and understandable
 - Good starting point



The Bremerhaven Work Instance





“Pipe Smoking, Anarchistic Researchers”?

- Managing Development

- Not necessarily a vice or virtue
- Workshops
 - Presentations: 150+ staff from over 20 countries
 - Workshops (1-3 days): 40+ staff from 10 countries
 - Continuous workshops: 6 staff from 5 countries
- Reviews
 - On average every 2 weeks
 - Formal, informal, business representatives, executive body
 - Major reviews: March ‘97, April ‘97, May ‘97, June ‘97, December ‘97, March ‘98
- Documentation
 - Documenting OO, participatory design, ethnography
 - Documenting interaction - representation of work instances
 - Documenting decisions