











Proactive (Design research) premises

- Ontology:
 Realist (real world exists but we are not seeking it)
- Epistemology: – We can intervene in the world to improve it
- Methodology:
 - Development/Design of systems, models
 - Qualitative and exploratory way of thinking, but could lead to quantitative confirmations

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- Axiology:
 - Relevance is stressed



When you should not use this approach

- An area is well known
- Theories and implementations are available on the field
- You do not have the tools or skills to build the system needed
- Example: Development of a new system for storing music on 35 cm opto-magnetic disks

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Products of Design Research

- Conceptual designs – Definition of relational model
- Methods
 - Design patterns
- Models and Systems
 - Prototypes (Mosaic)
 - Commercial applications (Netscape)
- Better theories
 - Relational algebra









Evaluation criteria according to Chen et al.

- The purpose is to study an important phenomenon in areas of information systems through system building
- The results make a significant contribution to the domain
- The system is testable against all the stated objectives and requirements
- The new system can provide better solutions to IS problems than the existing systems and design expertise gained from building the system can be generalized for future use.

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Evaluation criteria according to Sein, Purao & Rossi

- Internal criteria:
 - Match between the artifact and the "abstract idea".
 How well does the artifact embody the abstract idea that is being researched?
 - Match with generally accepted principles of designed artifacts
 - Is the artifact a "good system" as defined by the field (good interfaces, easy to use etc.)

Evaluation criteria according to S, P & R

• External criteria:

- Advancement of design theory: Is the abstracted idea generalisable to other contexts or at least advance our understanding of other design contexts?
- Are the ideas, if not the elements of the artifact, reusable?
- Advancement of information systems discipline: Does the artifact behave in / influences/improves the environment/context in which it is intended to be used?

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Reactive and Proactive paradigms

- "Reactive" approaches take the world as a stable environment governed by laws that need to be discovered by scientists (i.e. are descriptive in nature)
- "Proactive" approaches aim at developing ways to achieve human goals (i.e. are prescriptive or constructive)
- The distinction between the two:
 - natural vs. artificial phenomena
 - the intent of the research.

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Reactive and Proactive paradigms

- · Goals of research in Reactive paradigms
 - Explanation research: Truth Seeking and/or Understanding
 - Knowledge for its own sake
- · Goals of research in Proactive paradigms
 - Design and Action Research: Improving Practice, solving problems
 Utilitarian perspective
- Link between Reactive and Proactive paradigms
 - Proactive (Design) creates artifacts, giving the phenomena that Reactive (Explanation research) can study
 - Proactive (Design) may depend on knowledge created by Reactive in creating new artifacts
 - Proactive (Action) may depend on knowledge created by Reactive as a basis for intervention

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Proactive (Action research) premises

- Ontology:
 - Information systems are Social systems with technical implications or Technical systems with social implications
- Epistemology:
 - Knowledge for action
 - Knowledge for critical reflection
 - Reflective science or Philosophy
- Methodology:
 - Active intervention in organizational contexts
 - Qualitative and exploratory way of thinking
- Axiology:
 - Relevance is vital: prime goal is problem solving

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Proactive (Action research) basics

- Assumptions:
 - Social settings cannot be reduced for study
 - Action (i.e. intervention) brings understanding
 - Action research is performed collaboratively; Researchers and practitioners are partners;
- Action research is building/testing theory within context of solving an immediate practical problem in real setting
- Thus it combines theory and practice, researchers and practitioners, and intervention and reflection
- Action research is not consulting: it is action, but still research





Mapping Design and Action Research processes

Design Research

- DR1 Identifying a need
- DR2 Building
- DR3 Evaluating
- DR4 Learning
- DR5 Theorizing

Action Research

- AR1 Diagnosing a problem
- AR2 Action planning
- AR3 Action taking
- AR4 Evaluating, reflecting

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• AR5 - Specifying learning

Mapping

Map 1 - DR1 -> AR1 Map 2 - DR2 -> AR2 + AR3 Map 3 - DR3 -> AR4 Map 4 - DR4 + DR5 -> AR5





- DR2 = AR2 + AR3
- Design and action are both intervening into reality to improve or support existing organizational activities/processes, *but*
 - In DR the idea of intervention is not clearly "planned" i.e. it does not involve a clear set of steps
 - In AR, planning and acting are distinct steps



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DR-AR Mapping: Map 3 (Evaluation)

- DR3 = AR4
- · Both approaches stress problem solving
- For DR, evaluation involves additionally:
 - Internal criteria
 - Match between the artifact and the "abstract idea"
 - · Match with generally accepted principles of designed artifacts
 - External criteria
 - Advancement of design theory
 - Advancement of information systems discipline:



- DR4 + DR5 = AR5
- · Both depend on reflection and generalization to theoretical concepts and other contexts
- In AR, what the practitioner members of the research team learn is vital

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DR-AR Mapping: Some Issues

- Role of theory
 - AR community is divided on whether a priori theory is necessary
 - In DR, a theoretical stance is not a prerequisite to starting the
 - research process; theoretical stance often emerges during design.
- Role of the user
 - In AR, there is always a user (practitioners)
 - In DR, a user is either present (systems designed for specific organizational context), or assumed
- Iteration
 - In DR, iterations are more frequent than in AR
- Continual modification element of play
 - Design research involves play in DR, the idea of intervention is true though it is not clearly "planned" i.e. it does not involve a clear set of steps IRIS 26



Design research in Action: e-Govt. Portal Project

- Background of the project
 - Step 1 Problem definition
 - Provide citizens of Kristiansand with easy access to relevant public information through Internet/web technology
- Step 2 Intervention
 - Design/build/action taking based on theoretical premises
 - Framework of e-service at local levels
 - Life-event based development/systems
 - "Genre based" development
 - Component based development
 - Cross-departmental virtual organisations
 - Specific technical platforms e.g. XML, web services

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Design research in Action: e-Govt. Portal Project

- Step 3 Evaluation
- Internal criteria
 - Does the portal include life event based design, reuse, object oriented
 - Is it a "good web portal" (as we normally know)
- External criteria
 - Is the abstracted idea generalizable to other contexts or at least advance our understanding of other design contexts?

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- Are the ideas, if not the elements of the artifact, reusable?
- How do the citizens of Kristiansand view the portal?

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Design research in Action: e-Govt. Portal Project

- Step 4 Learning
- Learning for research
 - Testing/validating design principles
 - The impact of e-service systems implementation on local government practices and structure
 - Understanding of the interplay between IT and organisation for a "radical" system
- · Learning for practice
 - How to organize and manage the introduction of innovative systems

