SYSTEM CHOICE

SU:E16:L3

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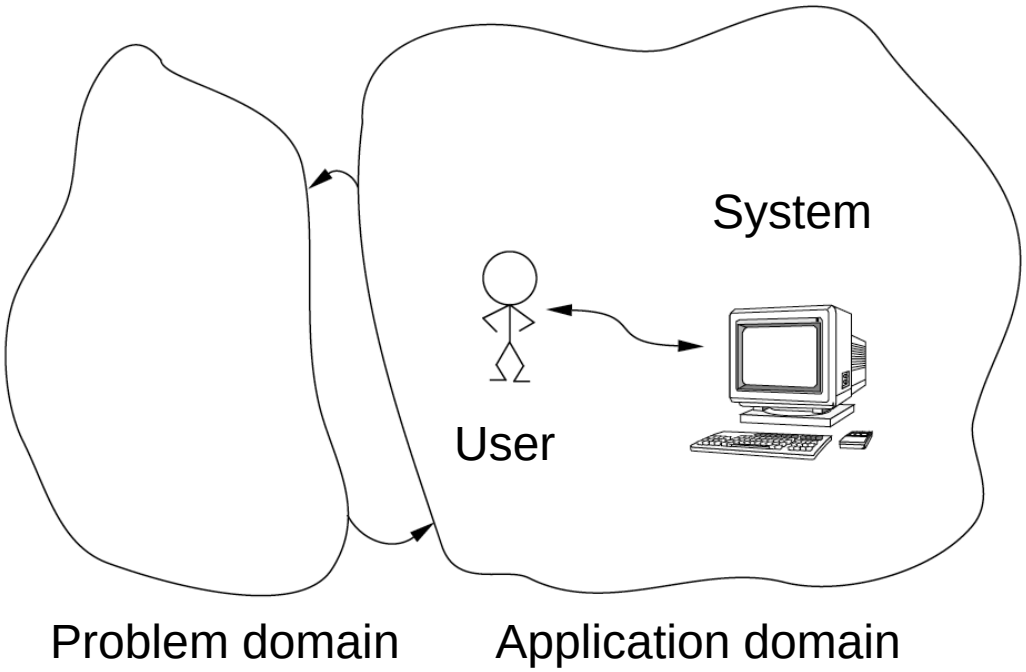
THE SYSTEM CONTEXT

Problem domain:
That part of a context that is administrated, monitored, or controlled by a system.

Application domain:
The organization that administrates, monitors, or controls a problem domain.



A problematic situation can be interpreted in many ways.

System choice is about defining the system.

In collaboration with the users!

SYSTEM CHOICE: THREE SUB ACTIVITIES

Situation

- Understand the situation and how stakeholders see it
- Create an overview of the situation with rich pictures

Ideas

- Criticize existing traditions
- Metaphors and exemplars
- Experiments with prototypes

Systems

- Define alternatives
- FACTOR
- System definition

Create an overview
Compare alternatives

RESULT

System definition: A concise description of a computerized system expressed in natural language

Sample definition: A computerized system used to prepare and plan an IFIP conference, with emphasis on administration of participants, articles, and the program itself. The system should primarily be an administrative tool, but secondarily serve as a communication medium for the program committee, the organizing committee, and the local administrative personnel to help them manage the conference. The system should be based on a cheap PC with current tools. The system should also be able to function in different types of environments, including use by volunteers who have great enthusiasm and greatly variable administrative experience.

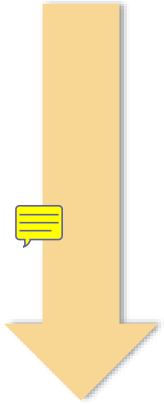
1

COLLABORATION WITH USERS

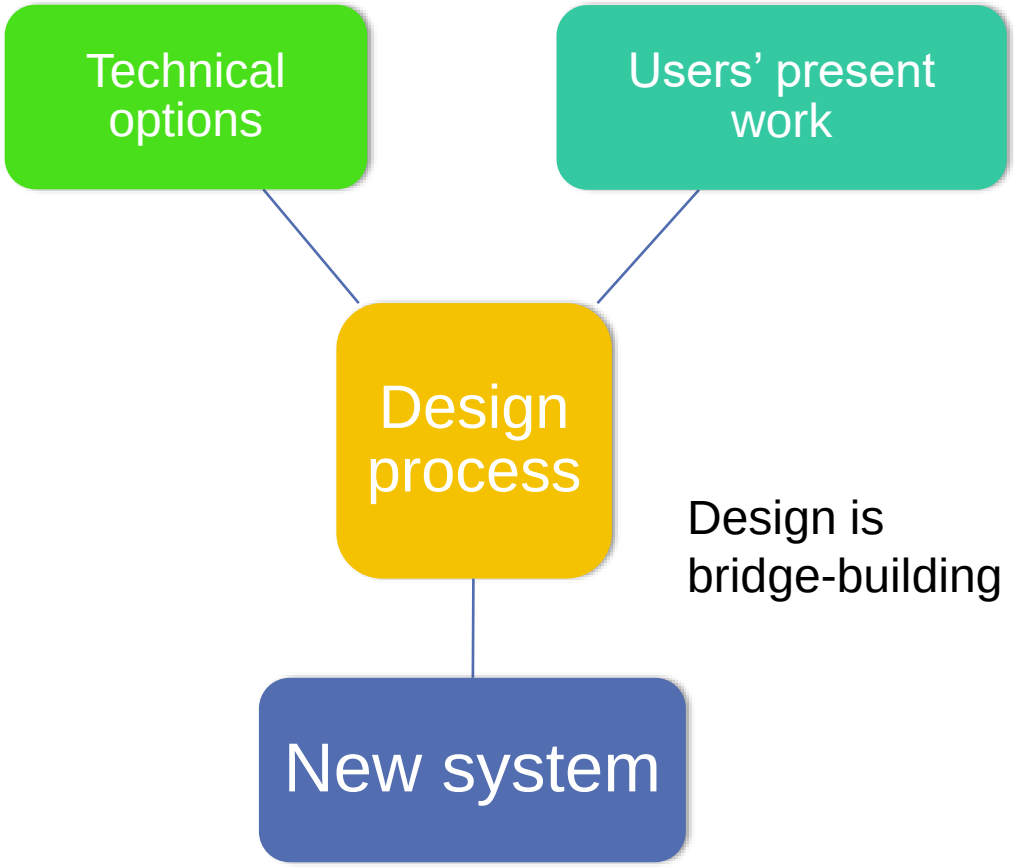
(Kensing & Munk-Madsen, 1993)

KNOWLEDGE DOMAINS IN SYSTEMS DEVELOPMENT

Abstract knowledge



Concrete experience



Design is bridge-building

We need abstract knowledge to get an overview of a domain
We need concrete experience to understand the users' situation and discuss future changes

ACTORS

Users

+

System developers

KNOWLEDGE AREAS

	User's present work	New system	Technological options
Abstract knowledge	Relevant structures on user's present work (2)	Visions and design proposals (5)	Overview of technological options (4)
Concrete knowledge	Concrete experience with user's present work (1)	Concrete experience with the new system (6)	Concrete experience with technological options (3)

TECHNIQUES AND TOOLS (1)

T & T	Areas of knowledge
Observations	1
Self-registration	1
Mock-ups	1, 6
Rich pictures	1, 2
Culture analysis	1, 2
OO design	5
Future workshop	2, 5
Card games	1, 6
Visits	3, 4
Study standard sw.	3, 4

	Users work	New system	Tech. options
Abstract knowledge	2	5	4
Concrete knowledge	1	6	3

1. Concrete experience - user's work
2. Relevant structures on user's work
3. Concrete experience - tech. options
4. Overview of technological options
5. Visions and design proposals
6. Concrete experience - the new system

TECHNIQUES AND TOOLS (2)

T & T	Areas of knowledge
Interviewing users	1, 2
Video recording	1
Think-aloud exp.	1, 6
Conceptual modeling	2
OO analysis	2, 5
ER-diagrams	2, 5
Metaphorical design	2, 5
Prototyping	3, 5, 6
Literature study	4
Forum theater	6

	Users work	New system	Tech. options
Abstract knowledge	2	5	4
Concrete knowledge	1	6	3

1. Concrete experience - user's work
2. Relevant structures on user's work
3. Concrete experience - tech. options
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GROUP DISCUSSION

- **You are developing an improved information system for Aalborg airport**
  - Sketch the system (with bullit points, pictures ...)
  - Make a list of stakeholders for the system
  - Are all stakeholders users? Why? Why not?

APPRECIATE THE SITUATION

Situation

- Understand the situation and how stakeholders see it
- Create an overview of the situation with rich pictures

Ideas

- Challenge existing traditions
- Use metaphors and exemplars
- Experiment with prototypes

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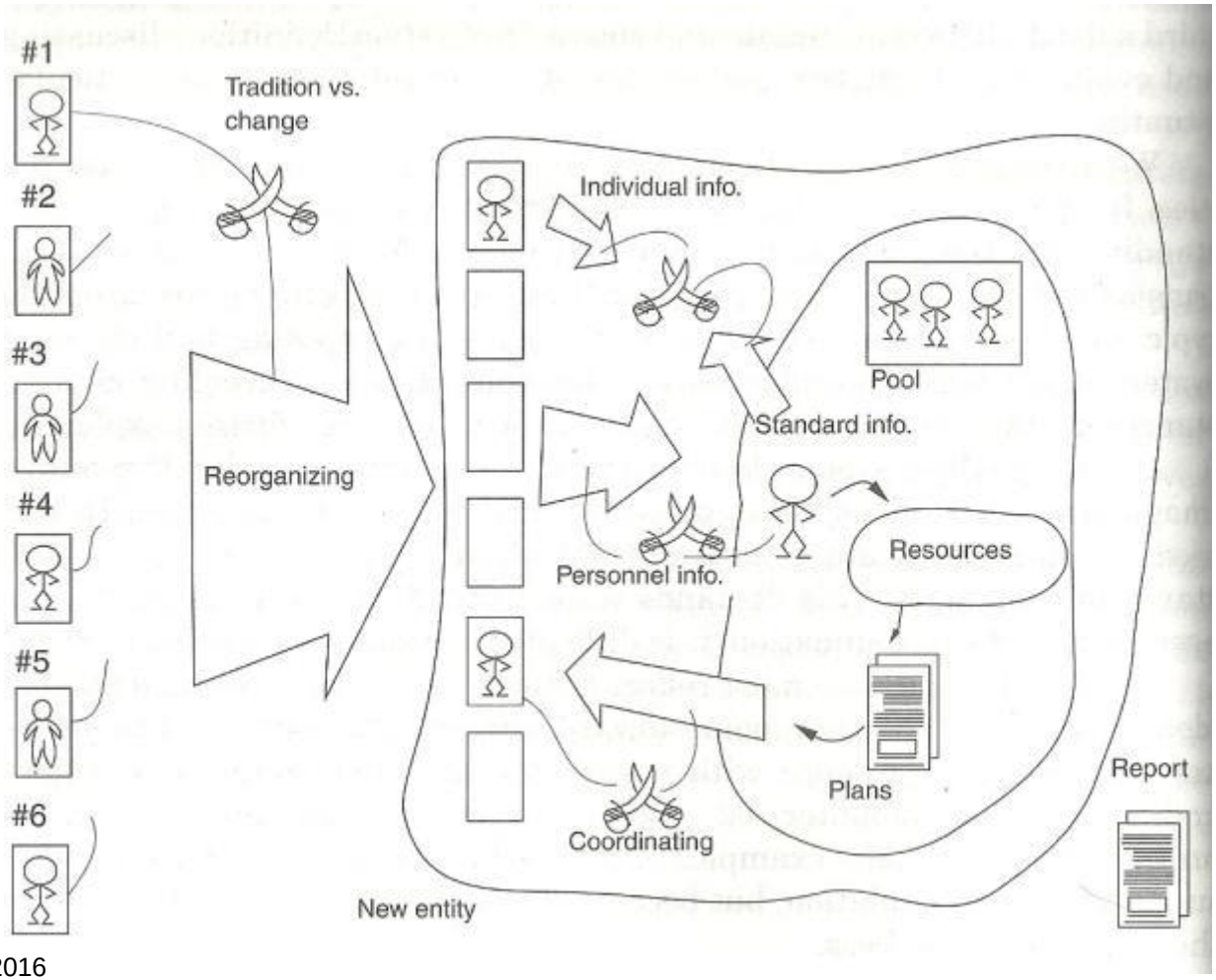
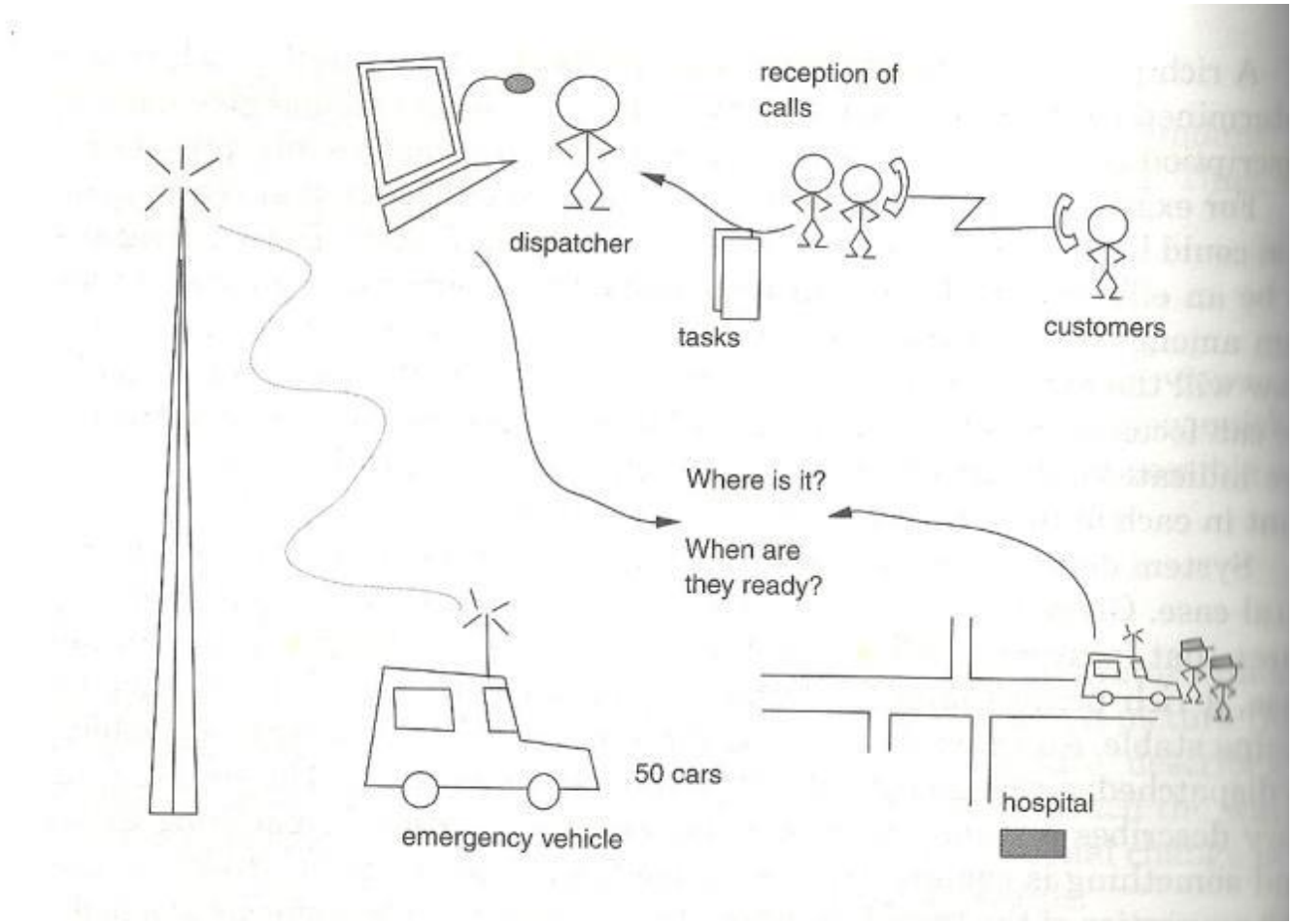
USE RICH PICTURES TO DESCRIBE THE SITUATION

- **Rich Picture:** an informal drawing that presents the illustrator's understanding of a situation.
  - Focuses on change or stability
  - Focuses on important aspects
  - Gives a broad description
  - A tool to help system developers organize their understanding
  - Faciitates interaction between users and developers
- **Users interpretations**
  - Visit the organization
  - Talk to/interview key persons

RICH PICTURE WITH FOCUS ON CHANGE



RICH PICTURE WITH FOCUS ON STABILITY



DRAWING RICH PICTURES

- **Entities:**
  - People and places,
  - Roles and tasks tie people together
- **Processes (use arrows):**
  - Work and production,
  - Information processing (how people use information to interact),
  - Planning and control,
  - Development and organizational change
- **Structure (use lines or place within figures):**
  - Production and application,
  - Communication and agreements,
  - Ownership,
  - Membership,
  - Power relations

SOME ADVICE

- **Rich pictures should:**
  - Contain much information and be open to interpretation
  - Present processes and structures in a coherent way
  - Show at least one problematic area
  - Point to *several* relevant computerized systems
  - Be rich, but not chaotic
  - Illuminate key aspects of a situation in a way that promotes understand at many levels
  - Avoid representing data and data processing only.

GROUP DISCUSSION

- **Draw a rich picture that describes Aalborg airport from the perspective of a traveler**
  - You can focus on information and the process (or a part of it) from leaving home to the departure of the plane
- **Which problems and improvement possibilities can be seen in the rich picture?**
- **Upload the result to the forum “Rige billeder fra lektion 3/Rich pictures from lesson 3”**

CULTIVATE NEW IDEAS

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CREATE NEW IDEAS

Exemplars
(ex. Accounting system)

- Study an existing system
- Study spreadsheets
- Study standard solutions
- Study SAP

Metaphors
(ex. library)

- Inventory
- Coffee shop
- School
- Resource management

Experiment with prototypes

- Planning
- Development
- Preparation
- Test
- Summarizing

EXEMPLARS

- **Look at existing solutions**
  - Visit other organizations
  - Study standard systems on the market

- **For every existing IT-solution answer the following:**
  - Which ideas lay the groundwork for the system?
  - Do the ideas seem useful? Why?
  - Will the ideas work in your context? Why?
  - Can the ideas be adapted to your system? How?

METAPHORS

- **View a user organization or a system through a new lens**
  - E.g. look at a library system as an inventory control system
  - Help transfer ideas and experiences from other areas

- **For each metaphor:**
  - Create a list of aspects related to the metaphor
  - Transfer these aspects to your target system
  - Determine which of the aspects might be useful

How can metaphors be used to transcend habitual thinking?
Why is that important?

EXPERIMENT WITH PROTOTYPES

1. **Planning**
   - Describe the prototype content
2. **Development**
   - Start with simple prototypes on paper
   - Simple prototypes in for example Power point
   - Functioning prototypes
3. **Preparation**
   - Cooperation
   - Realism
   - Which users
4. **Test**
   - Use the prototype
   - Observe
   - Document
5. **Report results**

DEFINE ALTERNATIVE SYSTEMS

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SYSTEM DEFINITION

Example (conference system):

A computerized system used to prepare and plan an IFIP conference, with emphasis on administration of participants, articles, and the program itself. The system should primarily be an administrative tool, but secondarily serve as a communication medium for the program committee, the organizing committee, and the local administrative personnel to help them manage the conference. The system should be based on a cheap PC with current tools. The system should also be able to function in different types of environments, including use by volunteers who have great enthusiasm and greatly variable administrative experience.

SYSTEMDEFINITION (FACTOR)

Functionality	The system functions that support the application-domain tasks
Application domain	Those parts of an organization that administrate, monitor, or control a problem domain.
Conditions	The conditions under which the system will be developed and used.
Technology	The technology used to develop the system and the technology on which the system will run.
Objects	The main objects in the problem domain
Responsibility	The system's overall responsibility in relation to its context.

EXAMPLE

F Support for administration of program and participants at an international conference.

A A program committee, an organization committee, and the local administrative staff, all of whom assist in conference administration.

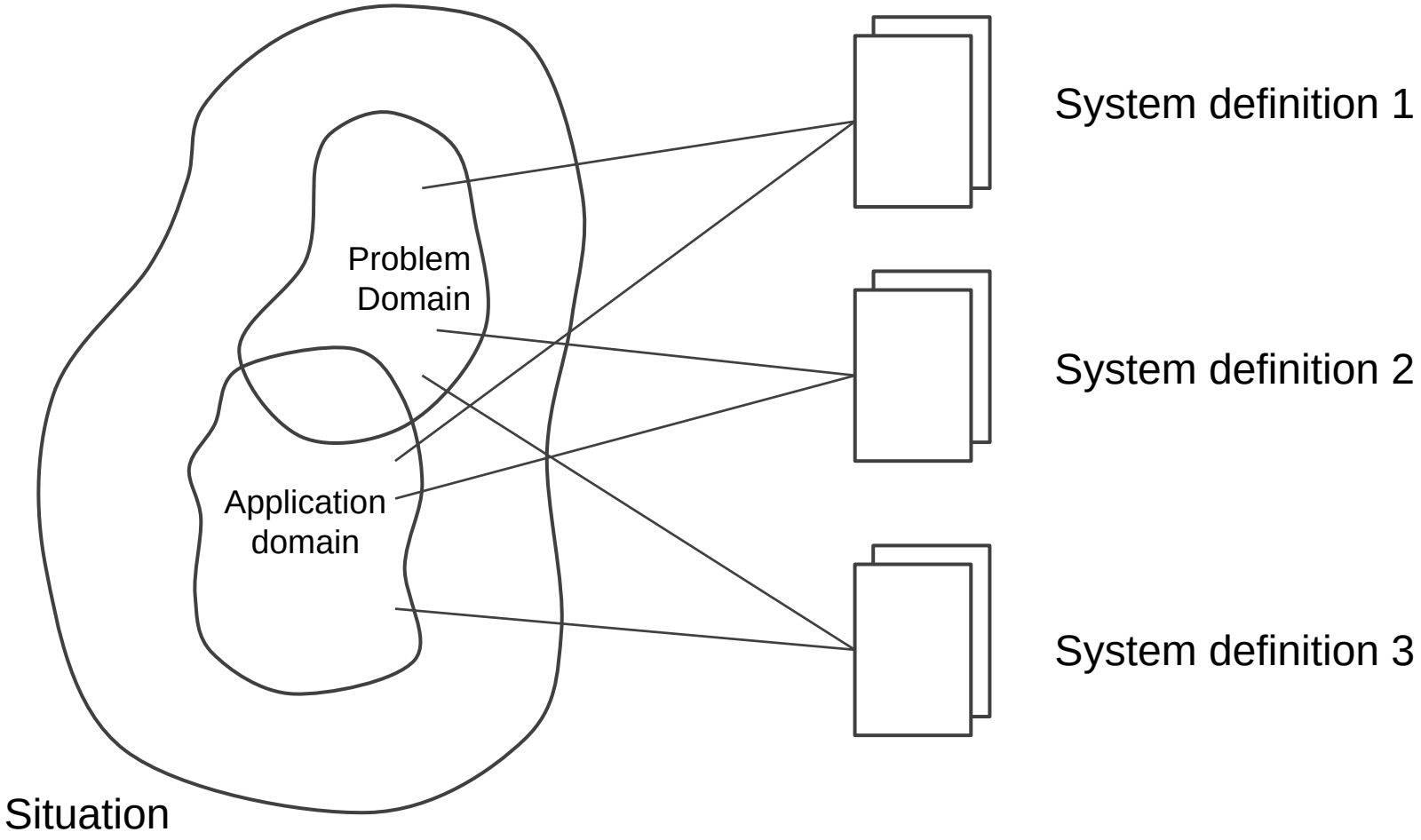
C The system should operate in an environmental characterized in part by a voluntary workforce with relatively high enthusiasm and variable administrative experience.

T An ordinary PC with common tools.

O Participants, papers, and program.

R Administrative tool and communication medium.

DEFINE ALTERNATIVE SYSTEMS



TWO ALTERNATIVES (BANK SYSTEM)

SYSTEM DEFINITION 1	SYSTEM DEFINITION 2
F: money transfer	**F:** money transfer
A: Bank employees	**A:** Bank customers
C: Used by bank professionals with high experience	**C:** Used by people with different backgrounds and IT experience
T: Desktop PC's	**T:** Tablets, Internet
O: Accounts, customers	**O:** Accounts, customers
R: Administrative tool	**R:** Tool for self-service

CHOOSE A SYSTEM

- A system is a whole
- Systems are defined in system definitions
- Choose one system
- Base argumentation on reliable information
- The users choose the system
- The software developers organize and support

GROUP DISCUSSION

- **Create at least two system definitions for a system for Aalborg Airport**
- **Discuss their similarities and differences**

OVERVIEW: 'SYSTEM CHOICE'

Purpose	• To agree on the overall system characteristics.
Concept	• System definition: A concise description of a computerized system expressed in natural language
Principles	• Appreciate the situation. • Cultivate new ideas. • Define alternative systems.
Result	• A system definition that fulfills the FACTOR criterion