SSE3: Advanced Software Technologies for Knowledge Management

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Project

- Status?

Lecture 6: Topics

- Conducting field studies
- Common information spaces
- Class exercise
- Organizational memory
- Putting it all together

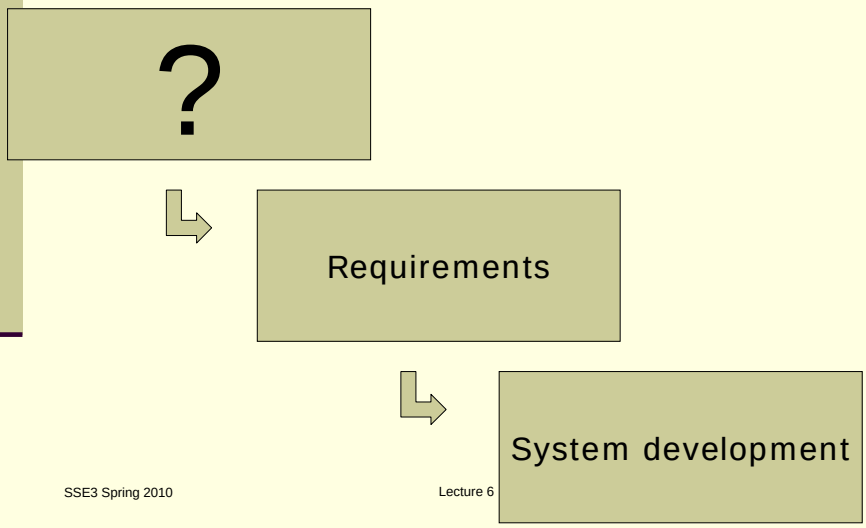
Any experience?

- In conducting field studies?
- In studying groups?
- …

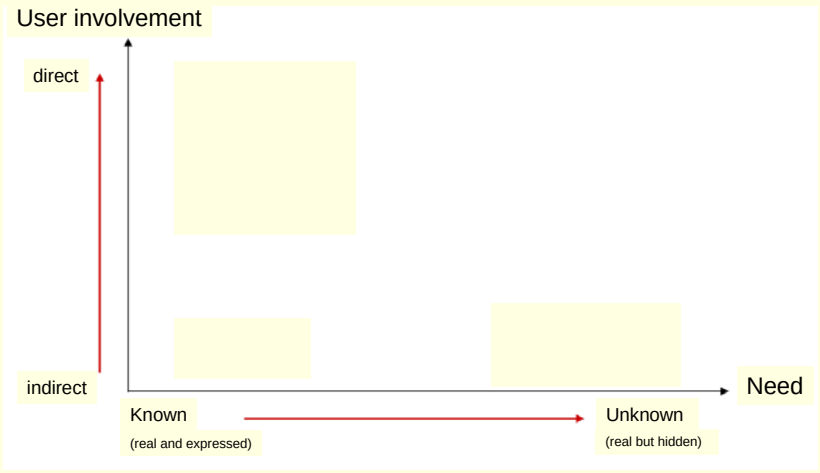
Hypothetical problem

- We would like to order an IT system that can support and automate work flow in our department at the hospital working with blood deceases
- Problems
  - We do not know their work flow
  - We do not know their needs
  - We do not know their users
  - …

User needs and involvement



User needs and involvement



User needs and involvement

observation, interviews, lead users, ordinary users, personas, cultural probes, registration, scenarios, ...

Requirements

System development

Humanities and social sciences

- Ethnography
- Anthropology
- Sociology
- Psychology
- …
- Collect and understand information about users and their behavior
- Objectively!!

Ethnographic field methods

- Field studies typically involve a combination of the following
  - Observation
  - Informal interviews
  - Participation in the ongoing activities (events) of the group that is studied
- Purpose
  - Understand human behavior (ethnographer)
  - Design artifacts that support the observed activities (designer / engineer)

Ethnographic field methods

- Field studies is often used in relation to design of IT systems to support collaboration between humans (CSCW)
  - AwareMedia
  - …
- There is no consensus about the principles used in relation to conducting a field study
  - Depends on the situation and purpose (goal)

Ethnographic field methods

- 4 basic principles often used in field studies
  - Studies of human activity always takes place in the natural settings
    - "Go native" (natural laboratory)
    - Learn about the "case" first hand
  - Human behaviors can only be understood in the every day context in which they occur (holism)
  - A descriptive understanding is developed
  - Behavior is always described from the point of view of those studied (members' point-of-view)

Ethnographic fi

1. Studies of human activity always takes place in the natural settings
2. Human behaviors can only be understood in the every day context in which they occur (holism)

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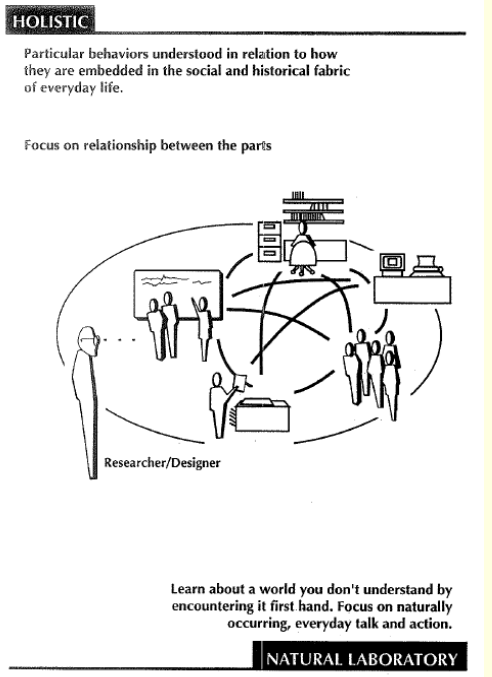

FIG. 7.1. Two principles of ethnograpy.

Ethnographic fie

3. A descriptive understanding is developed in stead of a prescriptive

   The ethnographer describes how people actually behave and acts, not how they ought to behave (non judging attitude)

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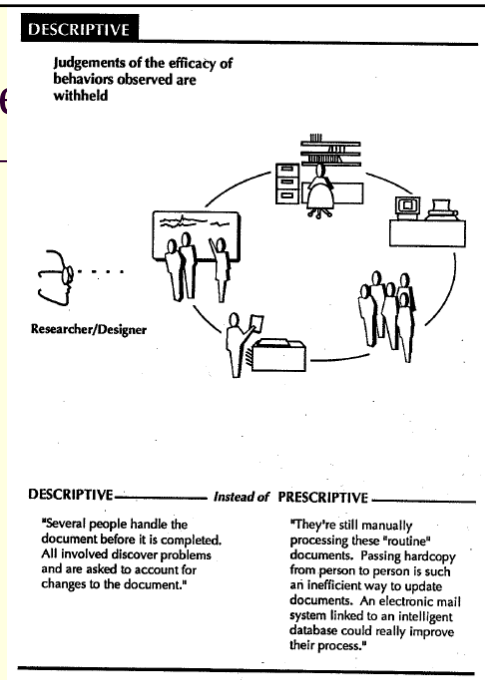
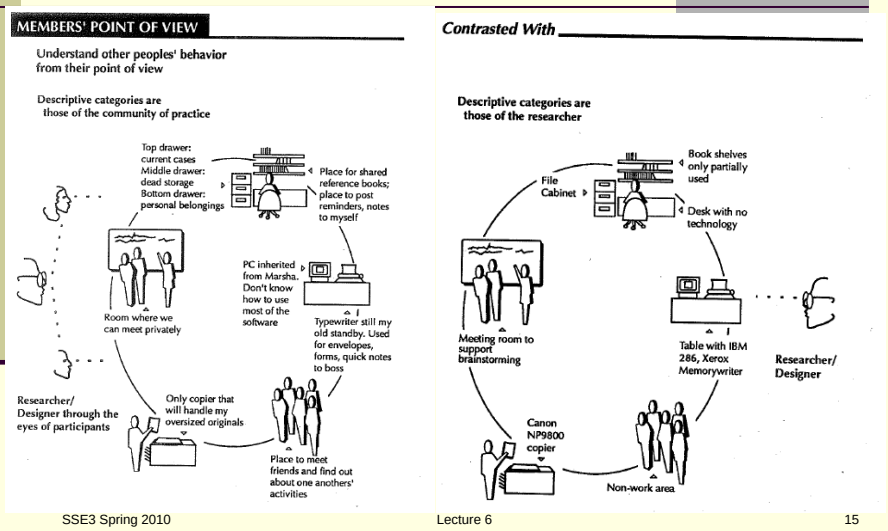


FIG. 7.2. Contrast between descriptive and prescriptive characterizations of activity.

Ethnographic field methods



Ethnographic field methods

- Personal engagement
  - Willingness to engage in situations that are out of ones control
  - Keep good relation to the people that are studied
- An iterative and improvisational approach to creating new insights

Ethnographic field methods

- Observer
  - Roles?

Various roles

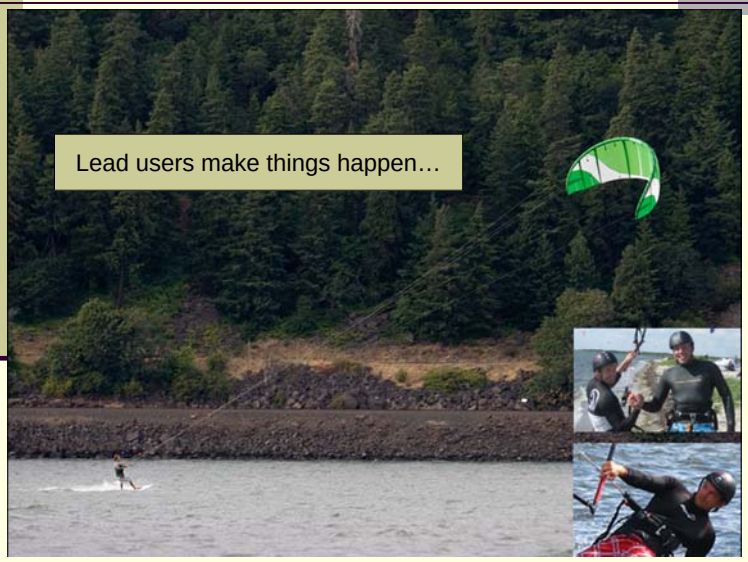
The fly on the wall ⟷ Participant observer

Advantages and drawbacks?

Observation and interview

- Not enough to ask people what they think about a system (or work flow)
  - They might be too polite to tell the truth
  - They might not be experts
  - Their vocabulary might be too limited to explain what is missing/wrong
  - …
- Observe
  - Now and then, ask “why” questions to get a deeper understanding
  - Also observe the ones that break the rules: will possibly provide insight about unanticipated use or new possibilities
  - Maintain the objectivity…

Lead users



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Lead users

- Knowledge, ideas and input from users that are on the cutting edge of needs and market trends
- They pose more requirements to the products that the average user
  - They are not content with what is there!!!!
- Users that have not had their needs covered
  - They adapt and develop based on their own knowledge and competences

Cultural probes

Cultural Probes

What is a Cultural Probe?

Cultural probes (also known as diary studies) provide a way of gathering information about people and their activities.

Unlike direct observation (like usability testing or traditional field studies), the technique allows users to self-report.

Information gathered from cultural probes is particularly useful early in the design process.

When are Cultural Probes appropriate?

Cultural probes are appropriate when you need to gather information from users with minimal influence on their actions, or when the process or event you're exploring takes place intermittently or over a long period.

For example, you could use cultural probes to explore how patients feel over the weeks or months following a surgical procedure, or how travelling salespeople manage their work.

How are Cultural Probes conducted?

Selected participants are briefed, given a kit of materials, and briefed about the requirement to record or note specific events, feelings or interactions over a specified period.

Typically, a follow-up interview is conducted at some point after the briefing session. This helps ensure that participants are actively engaged, and are collecting the required information.

At the end of the specified period, the materials are collected and analysed.

A de-briefing session is also typically conducted, in order to supplement, validate and otherwise explore the information gathered by the participants.

Information gathered is then analysed, and documented in some fashion.

What's in a Cultural Probe Kit?

The contents of the kit depend on what type of information you want to gather, and on the materials with which participants are familiar.

Most kits contain a diary for recording comments or impressions. The kit may also contain a scrapbook, or this may be combined with the diary.

Other contents may include a camera with printing capability (an instant camera or digital camera with printer).

It may also contain items such as a voice recorder, pens, post-it notes, staplers and the like – anything that can help the user gather and record information.

People respond positively to attractive kits, so using good quality materials is worthwhile.

Recruitment

Recruiting is particularly important with cultural probes, since they rely on a large investment of participants' time.

Participants in cultural probes are expected to spend at least several hours during the course of the activity, so they are likely to require remuneration that is more significant than that for, say, usability testing. In addition, they usually cannot be monitored closely, so problems may not be picked up during the course of the activity.

Therefore, it's particularly important to ensure that you recruit the right participants, and that you monitor and support them as well as possible throughout the process.

The Right Data

You can help participants gather the right information by briefing them carefully, and by providing kits that prompt them for the types of information you want. However, you also need to take care not to unduly restrict the information they gather, in case you miss out on important insights.

Providing a contact phone number that they can feel free to call for assistance or advice throughout the data-gathering period is a good idea.

Analysis and Documentation

Use affinity diagramming to analyse the data gathered. The data is also likely to be useful in creating personas, and this provides a good communication medium. Making participants' notes and photos available to project team members also provides a good way to communicate findings.

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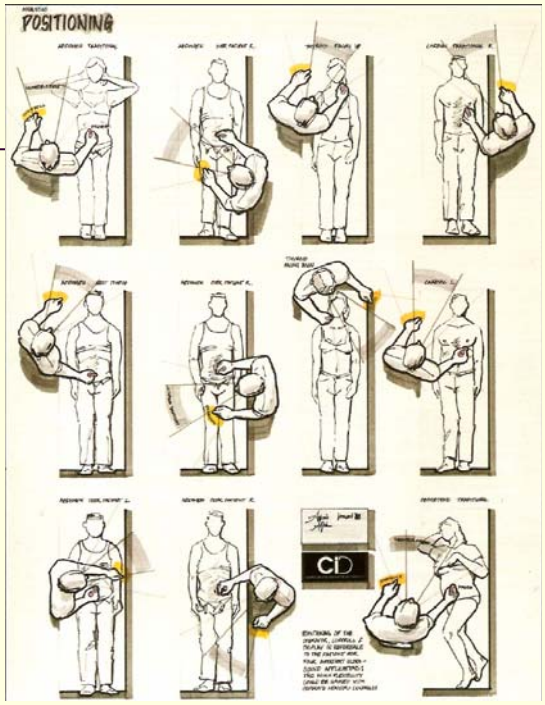
Registration

- Record status
- Overview
- New ideas



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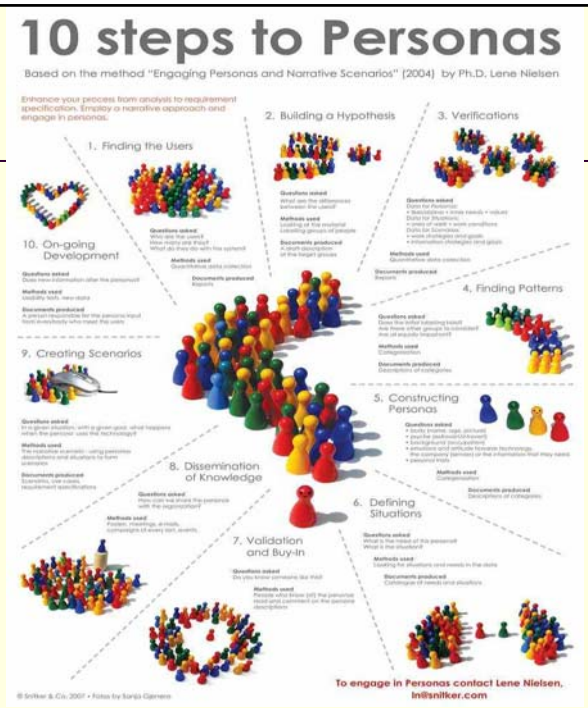


Summary

- Field study methods
  - Observation
  - Interviews
  - Lead users / ordinary users
  - Cultural probes
  - Data collection by registration
  - Personas
  - …
  - Scenarios (now, future, …)

Methods for the study of groups

- Gathering research evidence in social and behavioral science always involves the following
  - Somebody
  - doing something,
  - in some situation

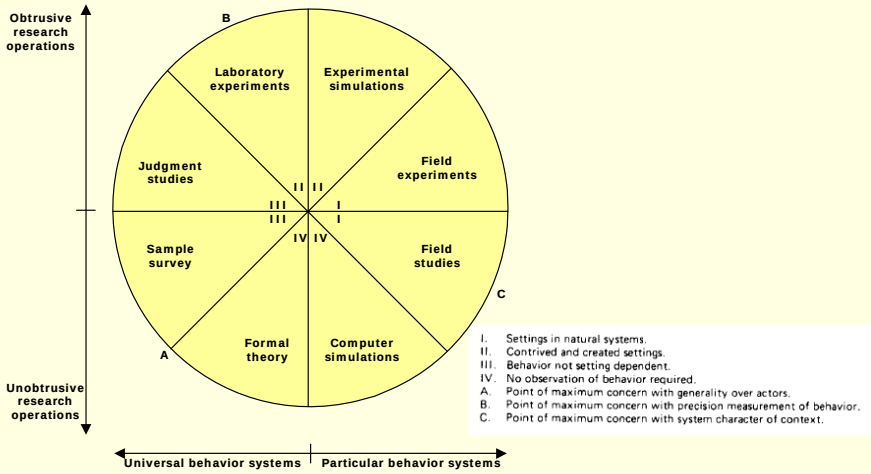
Strategic level issues

- Choosing a setting for a study
- Trying to maximize three factors when gathering research evidence
  - The generalizability of the evidence over the population of actors (A)
  - The precisions of the measurement of behaviors (B)
  - The realism of the situation or context (C)

Factors are not independent

- Not possible to maximize all three factors at the same time!
  - The things you do to increase precision of measurement of behavior (B) necessarily intrude upon the situation and reduce its naturalness (or realism) (C)
  - The things that you can do to keep high realism of context (C) will reduce the generality of the populations to which the results can be applied (A) or the precision of the information that you generate (B), or both

Research strategies



Design level issues

- What will you compare and what will you learn?
- Question forms
  - Base rate question
    - How often does X occur?
  - Relational question
    - Correlation
      - Between the value of X and the value Y?
    - Comparison
      - Between the X and Y?
- Validation of a conclusion
  - Only when you know what strategies where used for collection of information

Lessons learned

- Results depend on methods
- All methods have limitations
  - Results are flawed
- Not possible to maximize all desirable features
  - One method is not enough
  - Use multiple methods to compensate for flaws
- Each study (set of results) must be interpreted in relation to other sets of evidence bearing on the same question

Common information space

- Common Information Space (CIS)
- Conceptual framework to
  - Analyze and understand cooperative work
  - Describe the nature of cooperative work arrangement
- The framework is developed based on
  - Previous literature on CIS
  - An ethnographic field study of a CIS conducted at a Danish hospital ward

Common information space

- Field study
  - 3 months
  - Method
    - Observation + interviews
  - 28 stays of 5-8 hours each
    - Observation of work
    - Notes same day / next day
  - 12 interviews with staff
    - SHA (social health assistant), nurses, physicians (doctors)

Common information space

- Persons
- Division of labor based on educational level
  - Physicians
    - Diagnosis and treatment
  - Nurses
    - Responsible for patient care
  - SHA
    - Patient care – not all types of work
  - Overlap!

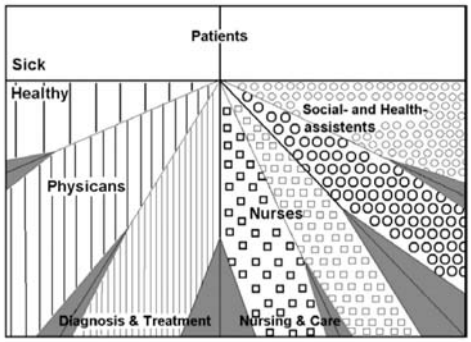


Figure 1: Professions, competencies, and grey areas.

Common information space

- Time
- Physicians
  - Normally from 8-16
  - On call between 16-8
- 3 shifts for
  - Nurses
  - SHA
- Morning meeting
- Briefing between shifts

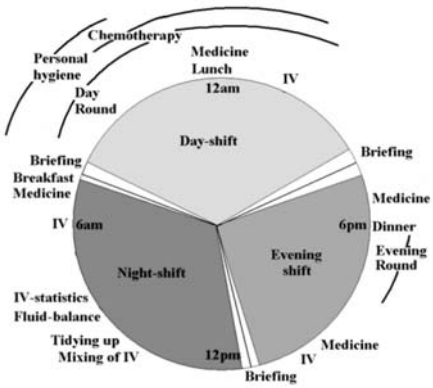


Figure 2. Nurses' shifts and most work-demanding tasks

Common information space

- Time
- Artifacts for coordination of work and sharing of information
  - Patient records
  - Care journal
  - Work calendar
  - Work schedule
  - Personal notes
  - …

Figure 3. The work-schedule

Common information space

- Physical space
- Placement of artifacts
  - To best support the cooperative work arrangement

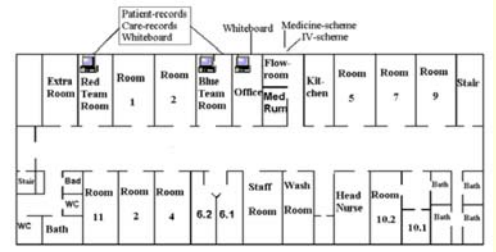


Figure 4. The Ward and usual place of artefacts

7 parameters that characterize a CIS

- The degree of distribution
  - Of the work: time, space, …
- The multiplicity of webs of significance
  - Efforts to achieve mutual understanding depends on: education, experience, culture, language, professions, …
- The level of required articulation work
  - The necessary degree of coordination

7 parameters that characterize a CIS

- Multiplicity and intensity of means of communication
  - Means of communication to achieve mutual interpretations: Face-to-face, phone, email, video conferences, …
- The web of artifacts
  - Artifacts used for coordination

7 parameters that characterize a CIS

- Immaterial mechanisms of interaction
  - Habits, division of labor, organizational structures, and other immaterial coordination mechanisms that reduce the need for coordination
- The need for precision and promptness of interpretation
  - The needed degree of precision and availability of information varies depending on the application domain

Class exercise

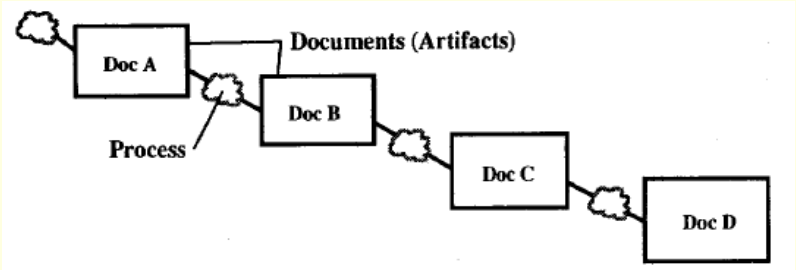
- Characterize the common information space at the Maersk Mc-Kinney Moller Institute
  - Used for planning, coordination, and supporting of teaching activities

Capturing organizational memory

- Organizational memory
  - = common information space
  - = corporate memory
- Organization memory
  - To give the ability to remember and learn from the past
- Paradigms
  - Artifact oriented
  - Process oriented

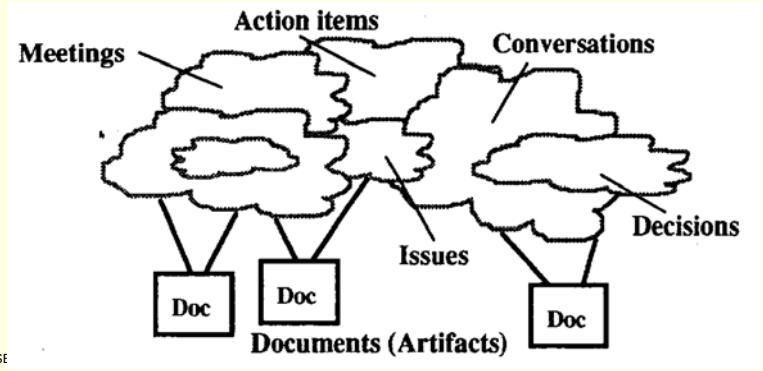
Artifact oriented paradigm

- Artifacts (diagrams, documents, letters, reports, etc.) are the focus of management attention. Tools and methods are solely for the production of modification of these artifacts. The process by which this work is done is regarded as secondary.



Process oriented paradigm

- There are still artifacts, but there are seen as being no more important than the interactions between people



Tools for organizational memory

- A move from an artifact to a process oriented perspective is necessary
- Technology for organizational memory
  - Hypertext
  - Groupware (CSCW)
  - A rhetorical method
    - Conversational model for structuring the process (conversations)
    - Example: issue-based information system (IBIS)

Putting it all together

- Knowledge management perspective
  - Data, information, knowledge, processes, workflow, …
- Hypertext structuring mechanisms
  - Associative, classification, spatial, issue-based, annotation, …
- Open hypertext approach
  - Structure awareness, enabling third party applications, levels of integration, …
- CSCW concepts and mechanisms
  - Common task, shared environment, asynchronous, synchronous, communication, collaboration, coordination, …
  - WYSIWIS, lock, event, access, versioning, session, awareness, CIS, articulation work, cooperative work arrangement, …
- Field studies