Human Activity modelling

Content
- Rich pictures
- Root definitions
- Conceptual models
- SSM,
- Others (Multiview, Ethics)
- Place in ISD
- Evaluation of Human Activity modelling

Why human behaviour?
- Started with participation
- History of participation - refer back to Hirschheim et al.
- Early ISD payed lip service to participation
- System technically viable – fail because?

History of ISD methodologies

<table>
<thead>
<tr>
<th>Generation</th>
<th>Principle management and organisational issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal life-cycle approaches</td>
<td>Control of SDLC; guidance through standardization</td>
</tr>
<tr>
<td>Structured approaches</td>
<td>Productivity, better maintainable systems, control over analyst/programmer</td>
</tr>
<tr>
<td>Prototyping and evolutionary approaches</td>
<td>Speed and Flexibility, overcome communication gap, right kind of system instead of getting system right</td>
</tr>
</tbody>
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History of ISD methodologies(2)

<table>
<thead>
<tr>
<th>Generation</th>
<th>Principle management and organisational issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-technical, participatory approaches</td>
<td>Control of ISD by users through participation; conflict management; joint optimisation</td>
</tr>
<tr>
<td>Sense-making and problem formulation approaches</td>
<td>Multiple perspectives in problem framing; software development as social reality construction</td>
</tr>
</tbody>
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History of ISD methodologies(3)

<table>
<thead>
<tr>
<th>Generation</th>
<th>Principle management and organisational issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade-Union led approaches</td>
<td>Labour/ management conflict; workers rights; industrial democracy</td>
</tr>
<tr>
<td>Emancipator approaches</td>
<td>Improve communication; furthering emancipatory effects of ISD</td>
</tr>
</tbody>
</table>
Answers to these problems:

- More than interviews
- HCI
- End user computing
- JAD and JRP
- Prototyping

Three levels of participation:

- Consultative – lowest level
- Representative – design group, equal say
- Consensus - involve all user department staff, user driven

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Human Activity modelling view of ISD:

Conventional

Human-oriented

Techniques used in human activity modelling

- Rich pictures
- Root definitions
- Conceptual models

Rich pictures

- Informal drawing that represents the illustrator’s understanding of a situation. (Mathiassen et al)
- Drawing or diagram of interfaces, boundaries, subsystems, organisation goals, issues, problems, concerns etc
- Represent the problem situation
- Express relationships, value judgments, ‘feel’ for the situation

Rich pictures

- Should be self explanatory
- Approach:
  - Elements of structure
  - Elements of process (what is going on)
- What system can be described in this system? (system is a perceived grouping of people, objects and activities which is meaningful)
Symbols for rich pictures

Advantages of Rich pictures

Disadvantages of rich pictures

Root definitions

• Not well-used as DFD, ERD etc.
• Might be regarded as a joke

• Identify two things: problems and systems
• Plain language
• Has 6 characteristics
Characteristics:

- **Client** – Whom (beneficiary, or victim, affected by the activities)
- **Actor** – Who (carries out the transformation)
- **Transformation** – what (the change taking place)
- **Weltanschauung** – world view (outlook that makes the root definition meaningful)
- **Owner** – (sponsor or controller)
- **Environment** – (wider system the problem situation is part)

Example

Why root definitions:

- Clarify the the situation
- Exposing different views
- Core purpose of the system
- Root definition elaborate the core transformation

Describe the transformation

<table>
<thead>
<tr>
<th>Transformation Process</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity is transformed in</td>
<td>Kids</td>
<td>Education needs met</td>
</tr>
<tr>
<td>Primary School</td>
<td>Teachers efforts retired teachers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government funding Funding used for teaching purposes</td>
<td></td>
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</tbody>
</table>

Aspects of the role of the computer lab at Siyabuswa

- **Client**: Community of Siyabuswa
- **Actors**: Tutors of the SEIDET Center
- **Transformation**: Iliterate community to Literate community
- **Worldview**: A belief that computer literacy will create a better standard of living
- **Owners**: SEIDET Center
- **Environment**: Need of computer knowledge in the community; appreciation of the needs of the community; appreciation of expectations and believes of the community
**Definition**

An SEIDET Center owned system to create a better standard of living by delivering literate users in the Siyabuswa community by using the tutors at the SEIDET Center. The training should be tailored to the needs and the expectations of the community.

**Conceptual models**

- After the rich picture and the root definition need to build a model which shows how the various activities are related to each other
- Two levels: Real world and systems thinking about the real world.

**Objective of the conceptual model**

- What ought to happen to achieve the goal in the specified root definition
- Compare with reality and try to identify the changes needed (ito SSM)

**Hard vs soft systems thinking**

- Well defined problem with a well know list of tasks
- Little social interaction
- SDLC (failure)
- Example: build a bridge
- Problems are real and solvable
- System objectives is easily reachable and defined
- Real world seen as systematic
- Different perceptions on reality
- Human aspects
- Different solutions
- Problems not so real and solvable
- Objectives can not be accomplished so easily and is not so definable

**Principles of SSM**

- A process of learning
- Cultural feasibility
- Participation
- Two modes of thought
SSM technique/methodology

A seven stage process of enquiry

It should not be conceived of as a linear progression from one stage to another

MODE I and MODE II

Phases or stages of SSM

Thinking in Human Activity modelling

• Hard Vs Soft ?
• Perspective
  – Objective vs Subjective
  – Nature of the organisation

Evaluation of Human Activity modelling

<table>
<thead>
<tr>
<th></th>
<th>Problem oriented</th>
<th>Product oriented</th>
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<tbody>
<tr>
<td>Conceptual</td>
<td>Structured analysis</td>
<td>Structured design</td>
</tr>
<tr>
<td></td>
<td>Entity relationship modelling</td>
<td>Object oriented design</td>
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<td></td>
<td>Logical construction of systems</td>
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<tr>
<td></td>
<td>Modern structured analysis</td>
<td></td>
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<tr>
<td></td>
<td>Object oriented analysis</td>
<td></td>
</tr>
<tr>
<td>Formal</td>
<td>PSL/PSA</td>
<td>Levels of abstraction</td>
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<tr>
<td></td>
<td>JSD</td>
<td>Steepest refinement</td>
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<tr>
<td></td>
<td>VDM</td>
<td>Proof of correctness</td>
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<tr>
<td></td>
<td>VDM</td>
<td>Data abstraction</td>
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<tr>
<td></td>
<td>VDM</td>
<td>JSP</td>
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<tr>
<td></td>
<td>VDM</td>
<td>Object oriented programming</td>
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Advantages/Benefits of Human Activity modelling

• Include different perspectives to a problem situation
• Compare reality with the conceptual model
• Participation a must
• Change is an central element of the process
• Others??

Disadvantages of Human Activity modelling

• Only useable in soft problems
• Can take a long time to reach consensus
• Some managers see this as silly
• Not well used
• Others??
Human Activity modelling view of ISD

Reading for next week

- No reading for next week