Task Analysis

(original presentation developed by Professor Neville Stanton, 1998)

Outline

* Origins of Task Analysis
* Purpose of Task Analysis
* Stages in Task Analysis
* Process of Hierarchical Task Analysis
* Examples
* Critique of Hierarchical Task Analysis
* Applications
* Conclusions

Origins of Task Analysis

* Gilbreth (1909) and Taylor (1911)
* Conrad (1951)
* Crossman (1956)
* Seymour (1966)
* Annett & Duncan (1967)
* Miller, Gallanter & Pribram (1968)
* Stammers, Shepherd, Patrick, Kirwan, Duncan, Diaper, Annett, Ainsworth

Purpose of Task Analysis

* Remove ambiguity
* Design training program
* Person specification and job description
* Work design - allocation of function
* Design systems/equipment/interfaces
* Evaluate design
* Assess safety

Stages in Task Analysis
✹ Data collection
✹ Description and representation
✹ Analysis

Hierarchical Task Analysis
✹ Describes task in terms of:
  ✹ goals
  ✹ operations
  ✹ plans
✹ Goals (what person is seeking to achieve)
✹ Operations (activities to meet goals)
✹ Plans (conditions under which operations are carried out)

Types of plan
✹ Procedural plan
✹ Branching plan
✹ Time sharing plan
✹ Selection plan

Types of Representation
✹ Hierarchical diagram
✹ Hierarchical text
✹ Tabular format

HTA Exercise
✹ Describe a device you know well in terms of goals, operations and plans
✹ Pay particular attention to hierarchical structure
✹ Check you analysis for logic

Critique of HTA
✻ Craft-skill requirement
✻ Subjectiveness in the interpretation
✻ Inconsistencies in the way in which people use HTA
✻ Diversity in terminology/notation
✻ Pseudo-cognitive analysis
✻ Limited data capture and representation
✻ Diversity in the world

Task Analysis For Error Identification
✻ Based upon HTA and Finite State Machines
✻ Putting HTA and FSM into State Space Diagrams
✻ Predicting errors from Transition Matrix
✻ Identifying hazards
✻ Task flow
✻ High validity

Predictive Human Error Analysis
✻ Based upon HTA and an error taxonomy
✻ Predicts errors and consequences
✻ Systematic
✻ Easy to learn
✻ High validity

Error taxonomy
✻ Checking errors
✻ Action errors
✻ Selection errors
✻ Retrieval errors
✻ Communication errors

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Conclusions

* HTA is a flexible, generic, methodology
* HTA links to many applications
* HTA is probably the most well used technique in the UK/USA
* HTA is a craft-skill
* HTA requires iteration and verification
* HTA requires practice

Further Reading

* chapter 6 in course text
* Diaper, D. (1989) Task ana lysis in HCI. Ellis Horwood: Chichester
* Kirwan,B. & Ainsworth, L. (1992) A guide to task analysis. Taylor & Francis: London.
* Ergonomics journal: Task Analysis (winter 1998)