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
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
- Ergonomics journal: Task Analysis (winter 1998)