MIE240: Human-Centred Systems Design

Task Analysis

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Learning Objectives

- Review objectives of each design phase and front-end analysis
- Continue developing understanding of task analysis
- Discuss HF goals and interventions in healthcare example

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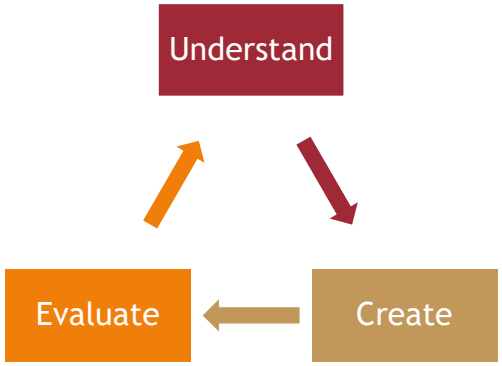
Review | Human centered design

- **Understand** – involve careful observations of people, tasks, and environments
- Create – generate design alternatives based on users' needs and HF knowledge and principles
- Evaluate – refine and iterate design based on user requirements and design specs through usability evaluations



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Review | Front end analysis

Understand phase

1. Understand the users & their needs (*e.g.. know thy user*)
2. Understand the context under which the product, service, system will be used
3. Understand their tasks (how long and in what order)

Methods
Observations
Video
Interviews
Surveys
Contextual inquiry
Site visits
Task analysis

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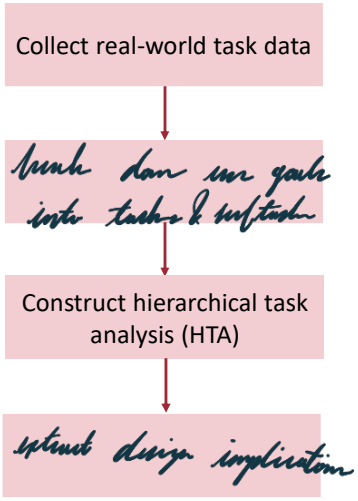
Understanding users' task



- Task analysis is a way of "systematically describing human interaction with a system to understand how to match demands of the system to human capabilities"
- Task analysis is to ensure that each task is supported by the system
  - What information does the user need to achieve their goal(s)?
  - How would they carry out the next action on the interface?
- Task analysis can be used to walk through an existing system to identify issues
  - Which tasks are supported? Which aren't?
  - Which steps take longer or require more effort than they should?

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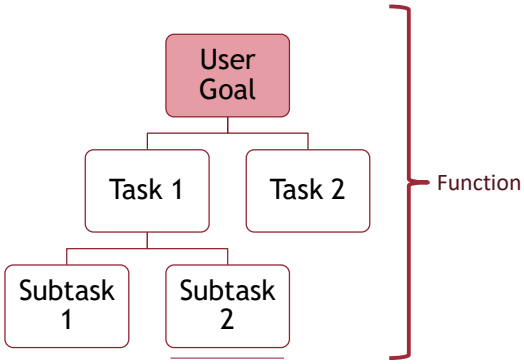
Hierarchical Task Analysis



*Line indicates stopping rule

HTA is an efficient way to show how work should be organized in order to meet a user goal. HTA can be graphical and/or tabular.

Goals: the desired system states

Tasks: methods by which goals are attained

Plans: conditions necessary to undertake the operations

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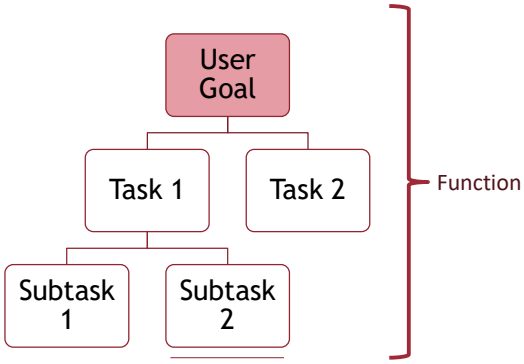
Hierarchical Task Analysis



*Line indicates stopping rule

Constructing an HTA

1. Describe the user goal and system functions
2. Limit the number of subtasks at a given level
3. Link tasks and subtasks, and describe the triggering conditions (plans), re-describe tasks as necessary
4. Iterate until you reach an appropriate level of description

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Practice task analysis: continuing the chest retractor example

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Performing a task analysis

1. Define purpose and data needed
2. Collect task data
3. Develop task analysis
4. Interpret data
5. Apply data in design process

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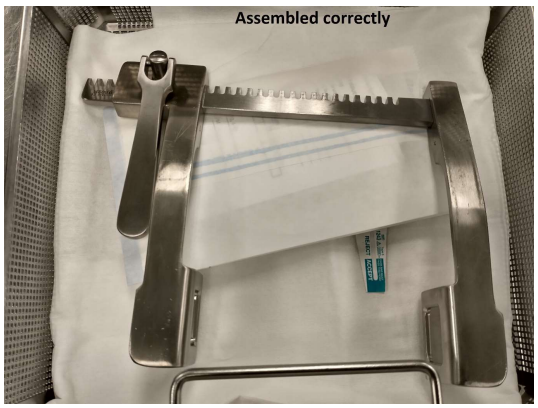
Step 1: Define purpose and data needed



purpose: general info to open chest and access heart
contextual questions
inspection in box instruments are used in healthcare
- time to assemble
- # of steps to assemble
- accuracy in first time assembly
- time under oil

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make it faster to assemble

Step 2: Collect task data

_____.

_____.

_____.

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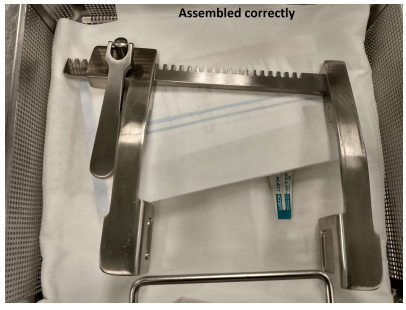
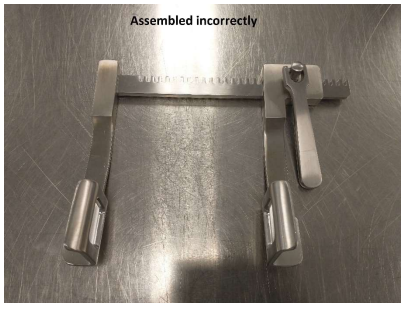
Resources

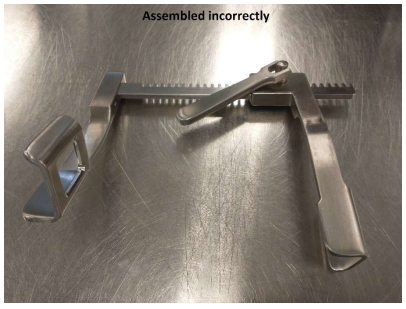
Videos

Simulation of chest retractor in use: https://www.youtube.com/watch?v=OhX3yFY5qYo&ab_channel=TestCamera

Assembling chest retractor: https://www.youtube.com/watch?v=yCIlA5EzxGk







Pictures of incorrect and correct assembly place in retractor book and at workstation

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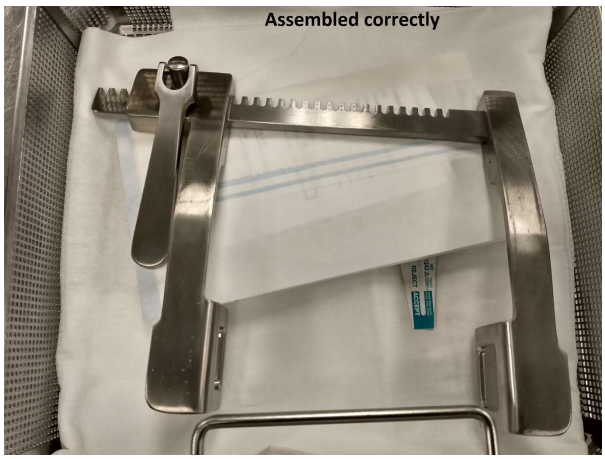
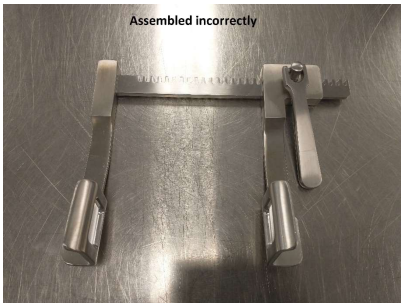
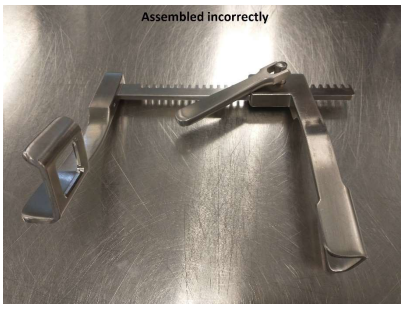
Resources







Pictures of incorrect and correct assembly place in retractor book and at workstation

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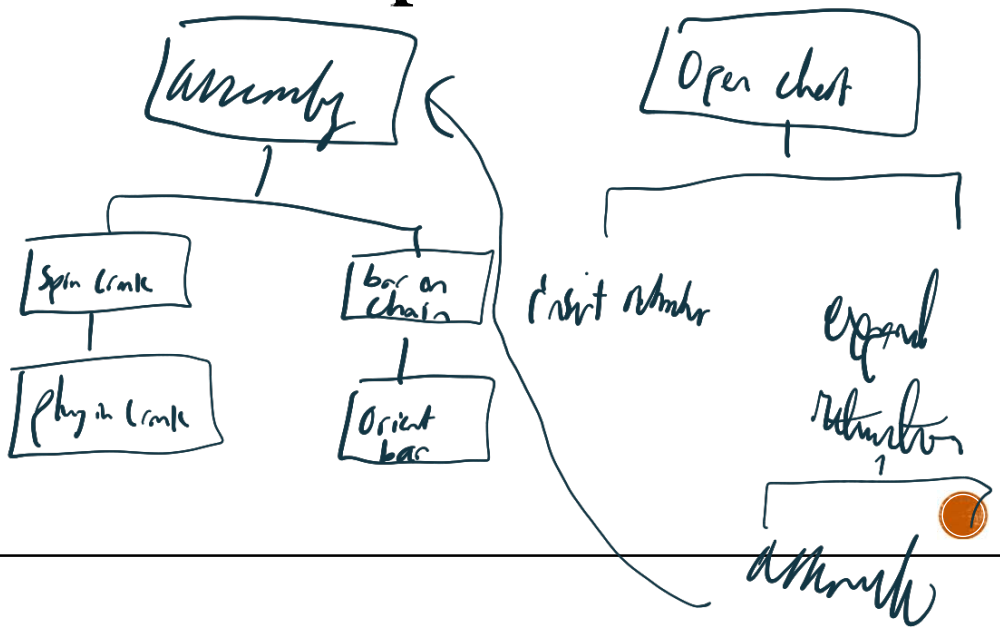
Develop HTA



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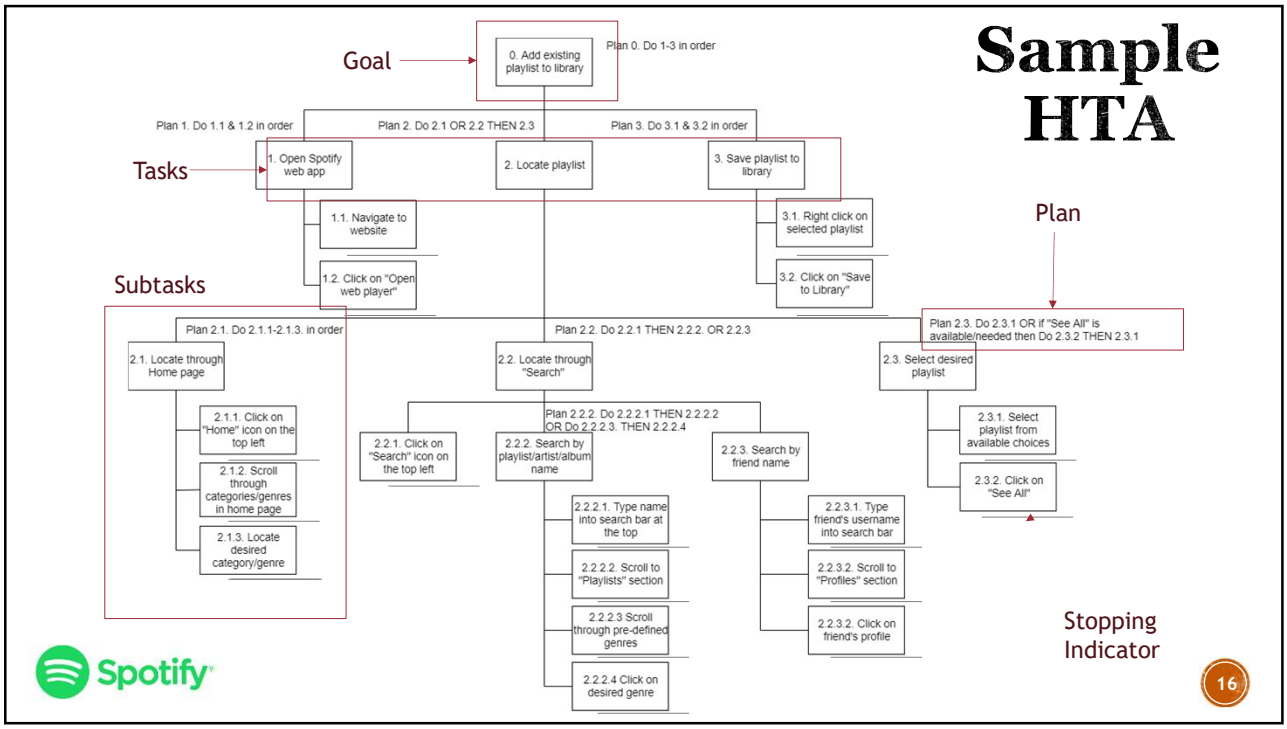

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Data Collection DO's and DON'Ts:

DO

- Get **informed consent** (video)
- Prepare a detailed methodology
- Conduct dry runs/pilot tests
- Document your notes in an organized manner
- Provide a safe, comfortable environment
- Be appreciative of participants' time

DON'T

- Ask leading questions
- Provide too much guidance/interference
- Insult participants, interrupt them, or talk over them
- Run over the allotted time period for a session
- Display a lack of preparation/professionalism

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A few last points:

- Follow the structure (including stopping points)
- Develop iteratively
- Define assumptions
- Tools: *LucidChart, SmartDraw, Visio, Draw.io*

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Summary

- The phases of the design cycle are understand, create, and evaluate
- Front end analysis involves the following objectives:
  - Understanding users
  - Understanding context of use
  - Understanding users' tasks
- Task analysis performed to understand users goals, the tasks and subtasks needed to achieve these goals, and the context of performance.
- HTA is a type of task analysis which provides an efficient way to show how work should be organized in order to meet a user goal.

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Next class (Wed., Jan. 15)

Topic: Project Intro and Proposal Writing Workshop

Review: Project guidelines

**Sit with your teammates during lecture!*

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