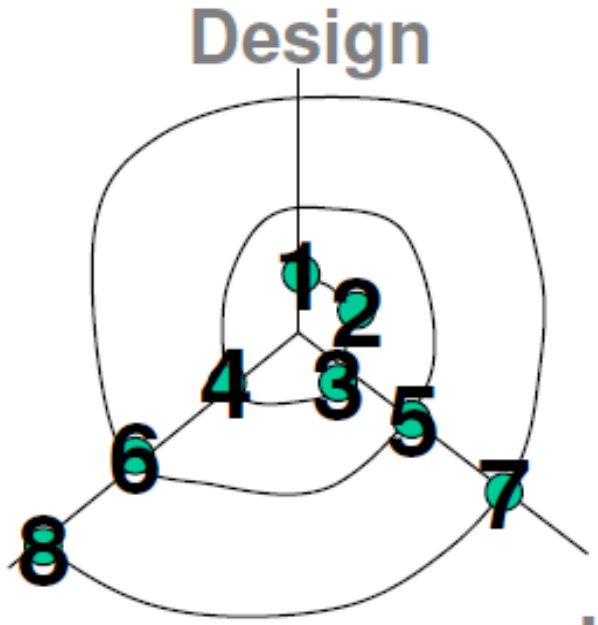
PART 6: TASK ANALYSIS

RECAP - USER INTERFACE DESIGN WITH THE ITERATIVE DESIGN MODEL



1. Task analysis
2. Design sketches
3. Paper prototype
4. In-class user testing
5. Computer prototype
6. Heuristic evaluation
7. Implementation
8. User testing

TASK ANALYSIS

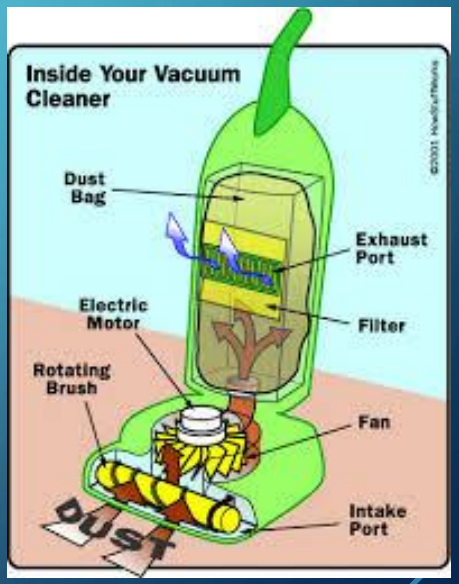
- **Task -** This is an activity that has to be performed to achieve a goal
- **Task analysis -** It is the process of analyzing the way people perform tasks

- Task analysis refers to techniques that analyze:
  - what people do
  - what things they work with
  - what they must know

TASK ANALYSIS

For Example:

- In order to clean the house, One needs to do the following:
  - get the vacuum cleaner out
  - fix the appropriate attachments
  - clean the rooms
  - when the dust bag gets full, empty it
  - put the vacuum cleaner and tools away
- One works with things such as:
  - vacuum cleaner, the attachments, dust bags, etc.
- One must know about:
  - vacuum cleaners, their attachments, dust bags, rooms, etc.



GENERAL METHOD FOR TASK ANALYSIS

- The general method for task analysis entails:
  - observing the user's behaviour
  - collecting unstructured lists of words and actions
  - organizing using notation or diagrams
- Note that in task analysis, one should focus on
  - the user's objective observable behaviour (external actions)
- and not on
  - the user's internal mental model

- Assignment: Read on Mental Models
- https://www.nngroup.com/articles/mental-models/
- https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/mental-models

DIFFERENCES FROM OTHER TECHNIQUES

Task analysis	**vs.**	**Systems analysis**
the user	- focus -	system design
Task analysis	**vs.**	**Cognitive modeling**
external actions	- focus -	internal mental state

PURPOSE OF TASK ANALYSIS

1. Requirement capture and system design
   - lift focus from system to use
   - suggest candidates for automation
   - facilitate presentation and discussion in an interdisciplinary team
   - improve understanding of the application domain
   - uncover user's conceptual model
2. User interface design
   - taxonomies suggest menu layout
   - object/action lists suggest user interface objects
   - task frequency guides default choices
   - task sequences guide dialogue design
3. Supporting evaluation of the system
4. Documentation and training/teaching

APPROACHES TO TASK ANALYSIS

1. Task decomposition
   - Splitting task into (ordered) subtasks

2. Knowledge based techniques
   - What the user knows about the task and how it is organized
   - The focus is on objects and actions
   - Taxonomies are created to represent levels of abstraction

3. Entity/object based analysis
   - relationships between objects, actions and the people who perform them

TASK DECOMPOSITION

- Aims
  - Describe the actions people do
  - Structure them within task subtask hierarchy
  - Describe order of subtasks

- There are several variants:
  - Hierarchical Task Analysis (HTA): the most common
  - ConcurTaskTrees (CTT), by Fabio Paternò (Pisa): uses temporal operators

- The most popular is Hierarchical Task Analysis (HTA)

HIERARCHICAL TASK ANALYSIS

- Hierarchical Task Analysis (HTA) is a task decomposition technique
- It has Hierarchy + Plans
  - Hierarchy - hierarchy of tasks and subtasks
  - Plans - the order of subtasks and the conditions under which they are performed (note that only the plans denote the order)

- Start with a user goal which is examined and the main tasks for achieving it are identified

(see next four slides for illustration)

TEXTUAL HTA - EXAMPLE 1

- Hierarchy

0. in order to clean the house

1. get the vacuum cleaner out
2. get the appropriate attachment
3. clean the rooms
    - 3.1. clean the hall
    - 3.2. clean the living rooms
    - 3.3. clean the bedrooms
4. empty the dust bag
5. put vacuum cleaner and attachments away

- Plans

Plan 0: do 1 - 2 - 3 - 5 in that order. when the dust bag gets full do 4

Plan 3: do any of 3.1, 3.2 or 3.3 in any order depending on which rooms need cleaning

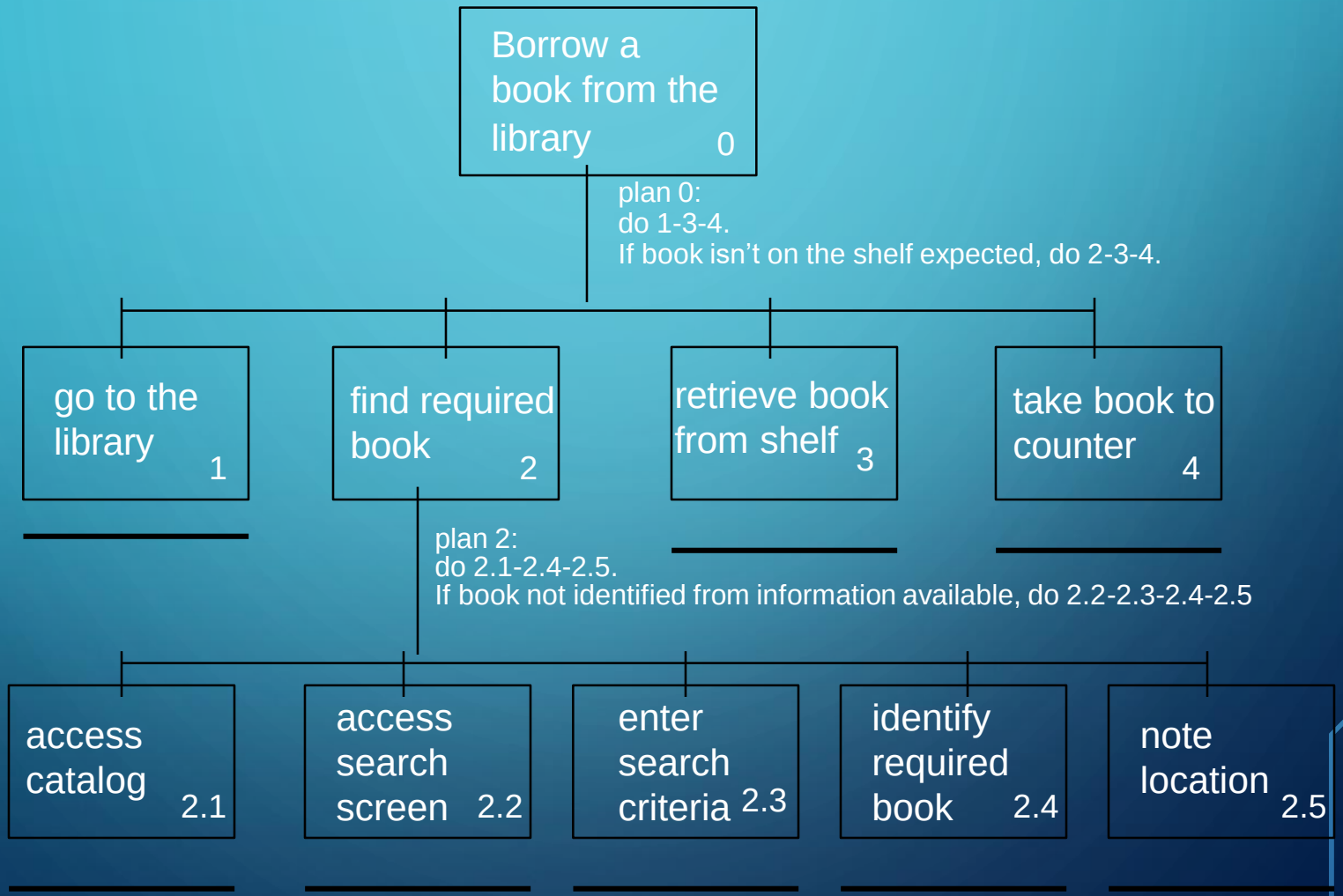
TEXTUAL HTA - EXAMPLE 2

0. In order to borrow a book from the library
   1. go to the library
   2. find the required book
      1. access library catalogue
      2. access the search screen
      3. enter search criteria
      4. identify required book
      5. note location
   3. go to correct shelf and retrieve book
   4. take book to checkout counter

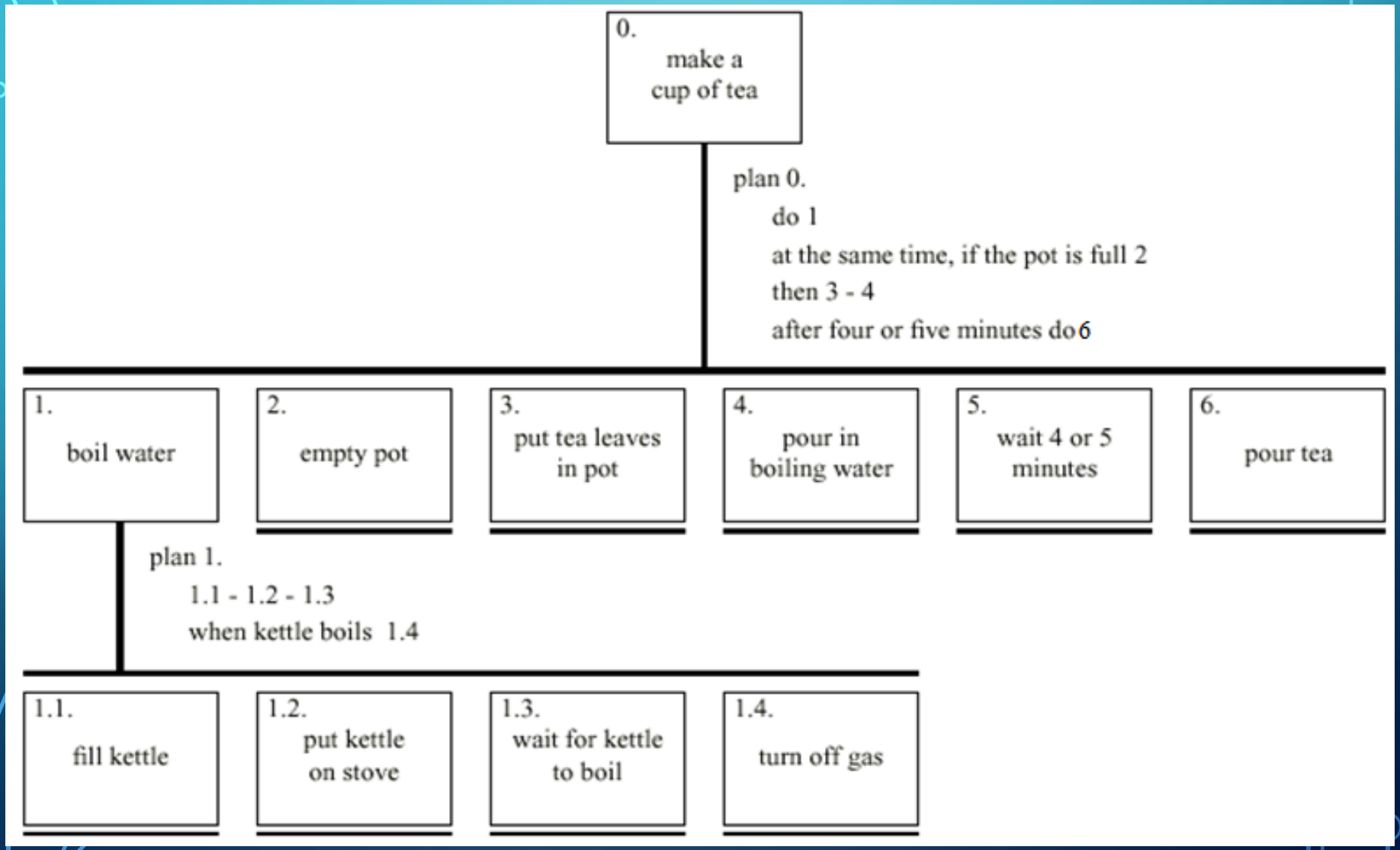
plan 0: do 1-3-4. If book isn"t on the shelf expected, do 2-3-4.

plan 2: do 2.1-2.4-2.5. If book not identified do 2.2-2.3-2.4.

DIAGRAMMATIC HTA – EXAMPLE 1



DIAGRAMMATIC HTA – EXAMPLE 2



READING ASSIGNMENT:

- Task Decomposition method:
  - ConcurTaskTrees (CTT) - How do they work?
- Approaches to Task Analysis:
  - Knowledge-based Techniques - How does this work?
  - Entity/object based analysis - How does this work?