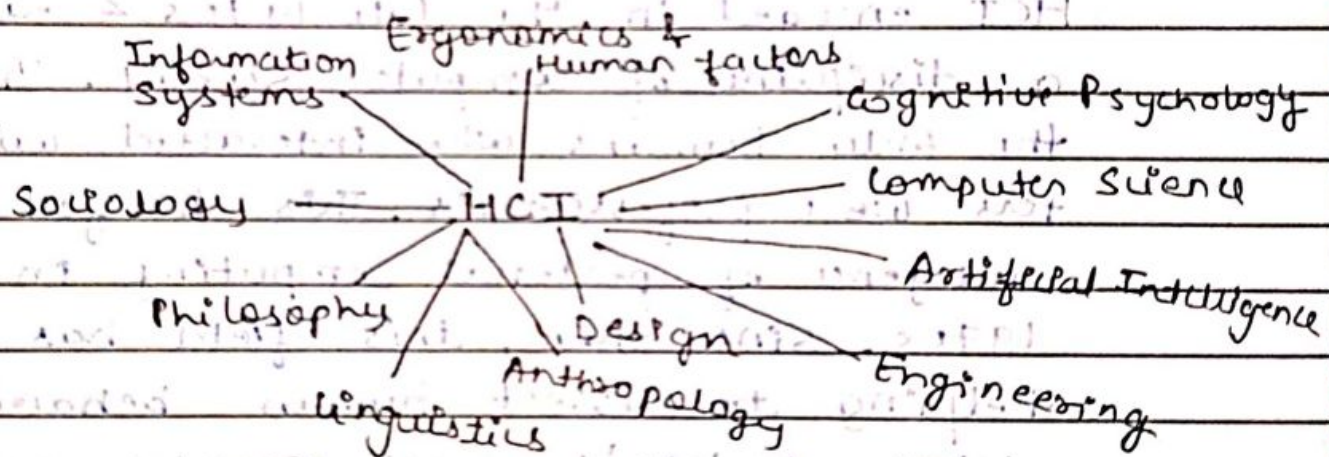


## \* Human Computer Interaction (HCI)

Human computer interaction is the study of interaction b/w people (users) and computers.

HCI is characterized as a dialogue or <sup>change</sup> interaction b/w the human & the computer because the output of one serves as the input for the other in an exchange of actions & intentions.

HCI is an interdisciplinary field in which computer scientists, engineers, psychologists, social scientists and design professional play important roles.

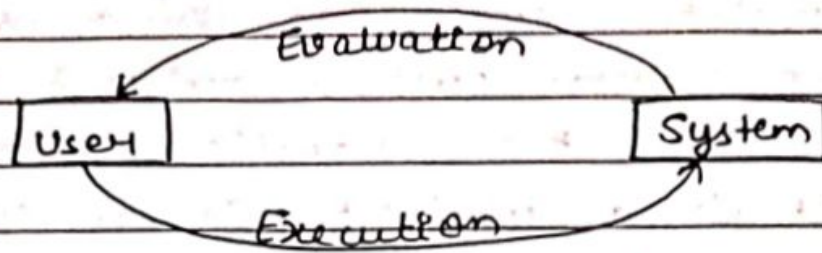


HCI is an interdisciplinary field as it combines theories & practices from a number of fields including computer science, anthropology, ergonomics, engineering, etc.

HCI is <sup>concerned</sup> ~~concerned~~ with the design, evaluation and implementation of interactive computing systems for human use & with the study of major phenomena surrounding them.



with two components: execution & evaluation.



### Norman's Interaction Cycle

Acc. to Norman, the execution component can be further divided into:

- Establish a goal that needs to be accomplished.
- Form the intention that will accomplish the goal.
- Specify the action sequences to implement the intentions.
- Execute the action.

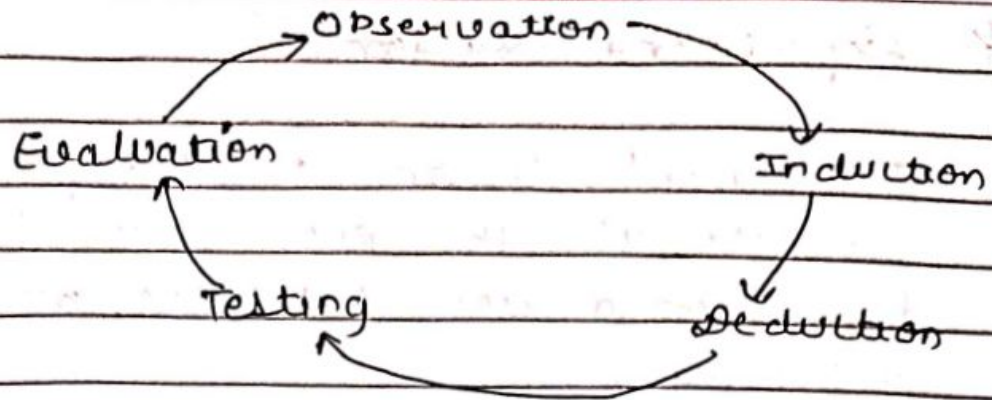
The evaluation component is divided into:

- Perceive the state of system resulting from the action.
- Interpret the system state.
- Evaluate the system state / evaluate your interpretation against the expectation based on your intentions.

When people try something they face two gulfs:

- The Gulf of execution: They try to figure out how it operates. It is the gap b/w the user's goal & its computerized implementation.
- The Gulf of evaluation: They try to figure out what happened. It is the gap b/w the computerized implementation of the user's goal and its evaluation by the user.

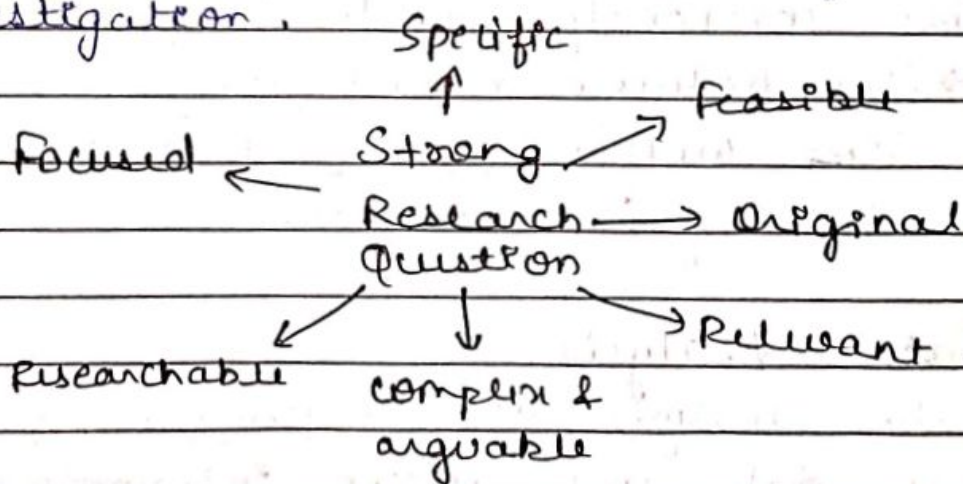




## Empirical Research Cycle

### \* Research Question Formulation

Formulating research questions is an essential step before starting any research. It involves exploring an existing uncertainty and identifying a need for further investigation.



Steps of Question Formulation :-

- Design a question focus (QFocus)
- Produce Questions
- Rework Questions
- Prioritize Questions
- Explore further
- Reflect



- Determine the overall goal of the task.
- Determine task sub-goals.
- Perform sub-goal decomposition
- Develop plans analysis

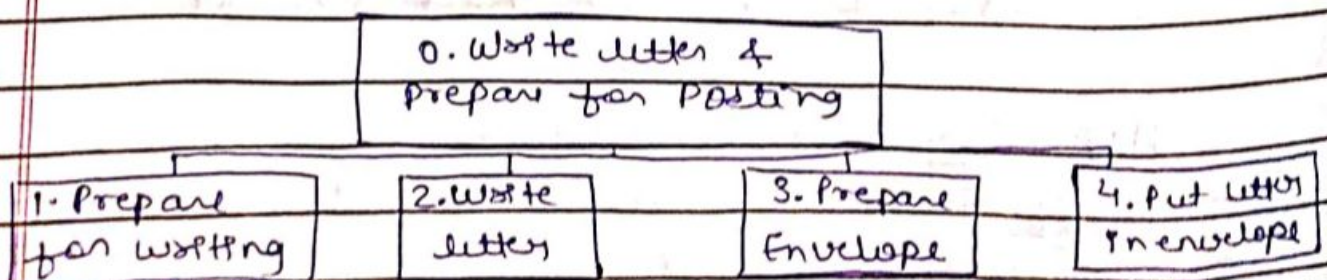
### Advantages

- It lets you compare different approaches to the same task.
- It provides extensive information about a task.
- Evaluate systems against usability or functional requirements.
- Helpful in error analysis.

### Disadvantages

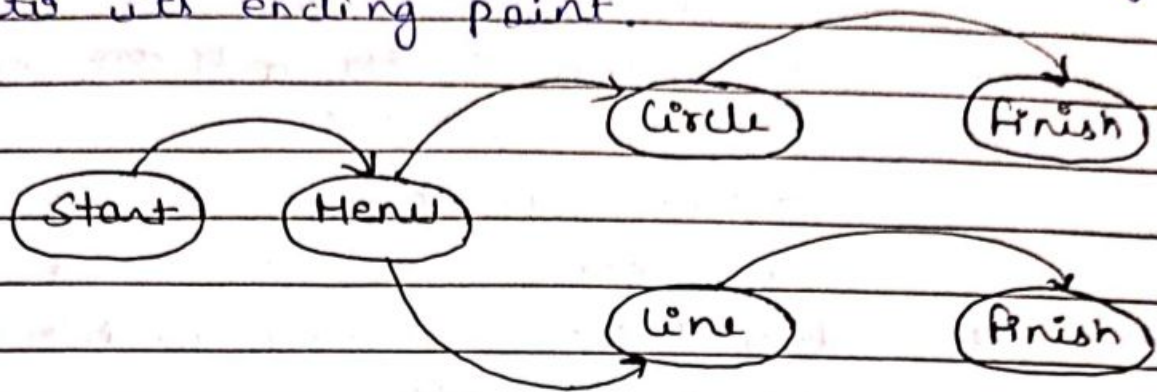
- HTA diagrams can become quite complex
- There is no strict rule for creating an HTA diagram so different analysts will generate inconsistent hierarchies at varying level of detail.
- Time consuming.
- It is not a predictive tool. It focuses on existing tasks.

eg -





- Arcs: The circles are joined by arcs, which denote the action or occurrence that causes the arc to change from its starting point to its ending point.



State Transition Network

## \* Statechart

A statechart models the flow of control from one state to another for a particular object within a system. Statecharts represent complex reactive systems that extends Finite state Machines (FSM), handle concurrency and adds memory to FSM.

Statecharts has the following states :-

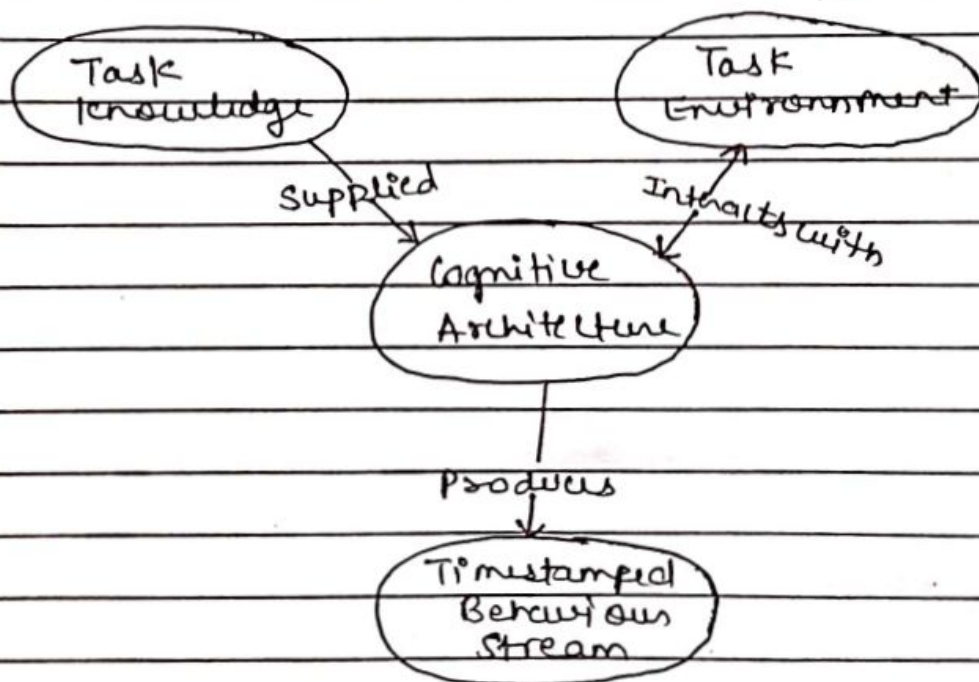
- Active state: The present state of the underlying FSM.
- Basic states: These are individual states and are not composed of other states.
- Super states: These states are composed of other states.

Components of state charts :-



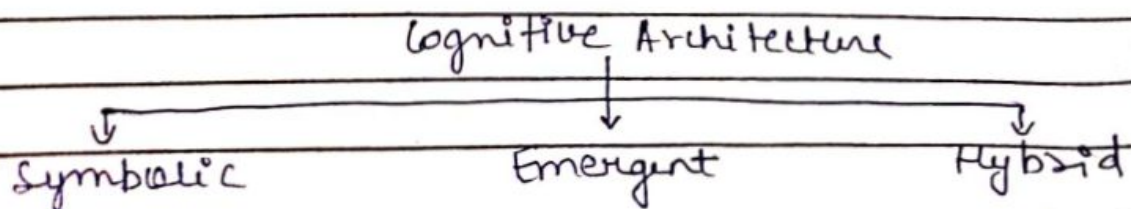
## \* Introduction to Cognitive Architecture

Cognitive architecture is the theory regarding the human mind, its structure, and how the various components work in sync to manage intelligent behaviours in complex environments. It aims to use cognitive psychology research to create a complete computer-based cognition model. Cognitive architecture aims to create artificial computational system processes that work like human.



## \* Types of Cognitive Architecture

Cognitive architecture can be symbolic, emergent and hybrid.



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