chapter 3

the interaction

The Interaction

- interaction models
  - translations between user and system
- ergonomics
  - physical characteristics of interaction
- interaction styles
  - the nature of user/system dialog

What is interaction?

communication

user ⟺ system

but is that all … ?

– see “language and action” in chapter 4 …

models of interaction

terms of interaction

Norman model

interaction framework

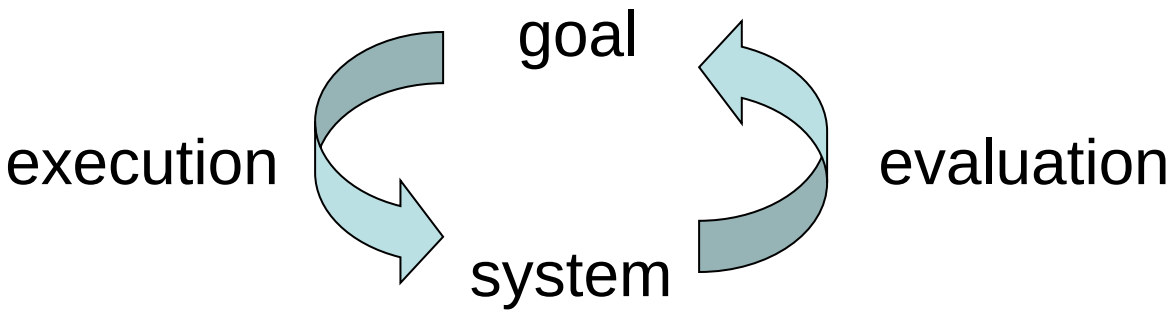
Some terms of interaction

- **Domain:** The area of knowledge, work, and expertise under study
- **Goal:** The desired output
- **Task:** The set of actions or operations to be performed to achieve the goal
- **Intention:** A specific action or operation of a task required to meet the goal
- **Core language:** The language used by the system
- **Task language:** The language used by the user

Donald Norman's model

- Seven stages
  - user establishes the goal
  - formulates intention
  - specifies actions at interface
  - executes action
  - perceives system state
  - interprets system state
  - evaluates system state with respect to goal
- Norman's model concentrates on user's view of the interface

execution/evaluation loop



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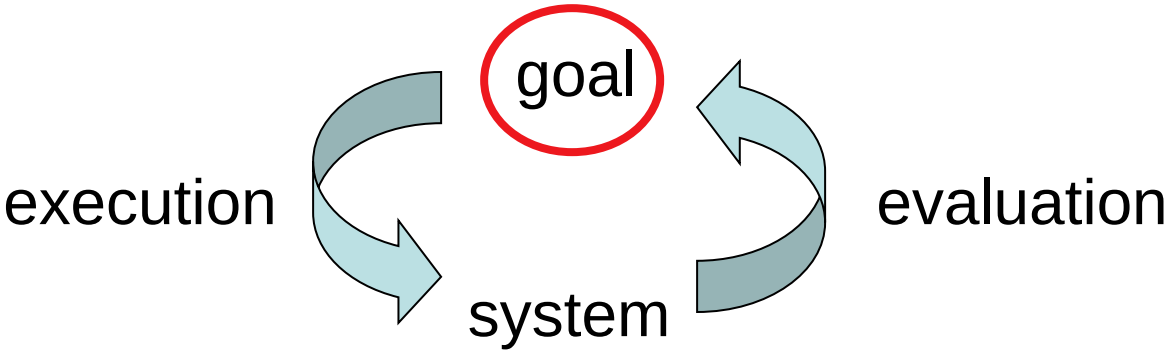

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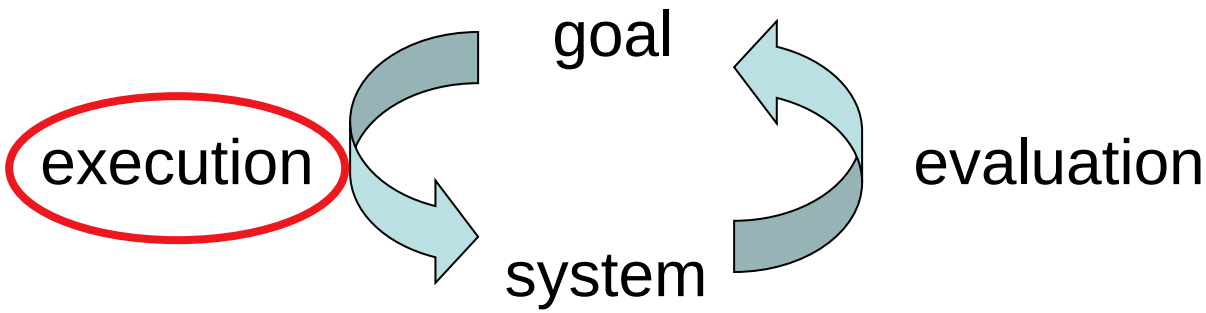

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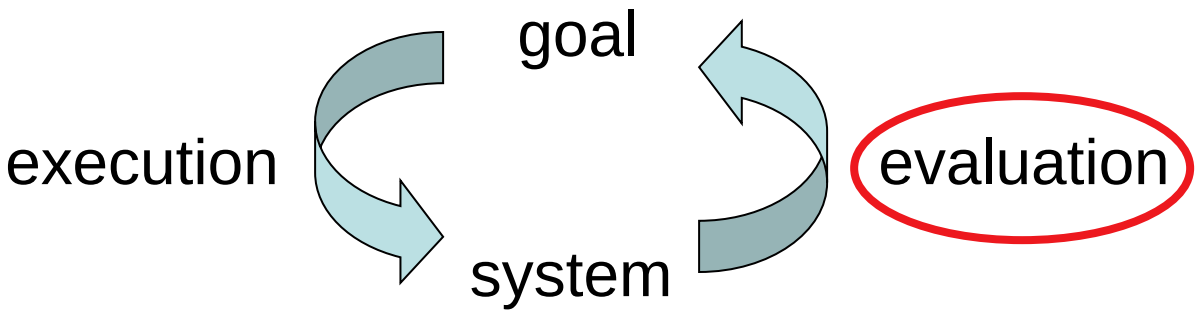

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Mapping Norman Model for creating an account(Activity)

- **1. Goal**

  User wants to create an account

- **Example:**
  "I want to sign up so I can use this application."

Mapping Norman Model for creating an account(Activity)

- **2. Forming the Intention**

User decides how to achieve the goal

- **Example:**
  "I will sign up using my email address."

Mapping Norman Model for creating an account(Activity)

- **Specifying the Action**
- *User plans concrete steps*
- **Example:**
- Click **Sign Up**
- Enter name, email, and password
- Click **Create Account**

Mapping Norman Model for creating an account(Activity)

- **Executing the Action**
- *User performs the actions*
- **Example:**
- Types email and password
- Clicks the **Sign Up** button

Mapping Norman Model for creating an account(Activity)

- **Perceiving the System State**
- *User observes system feedback*
- **Example:**
- "Account created successfully" message
- Email verification prompt appears
- Any alternative feedback?

Mapping Norman Model for creating an account(Activity)

- **Interpreting the System State**
- *User understands what happened*
- **Example:**
  "My account is created, but I need to verify my email first."

Mapping Norman Model for creating an account(Activity)

- **Evaluating the Outcome**
- *User checks if goal is achieved*
- **Example:**
  "Yes, I can now log in after email verification."

Using Norman's model

Some systems are harder to use than others

Gulf of Execution

user's formulation of actions

≠ actions allowed by the system

Gulf of Evaluation

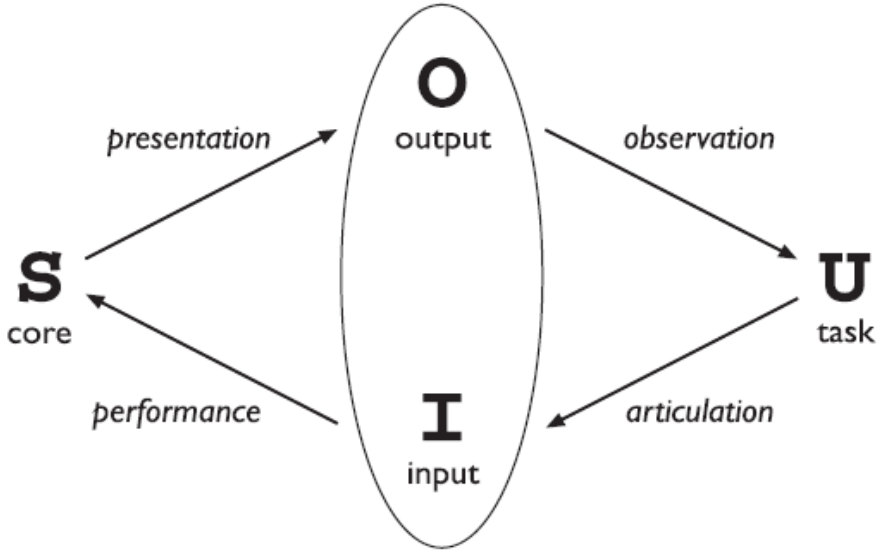
user's expectation of changed system state

≠ actual presentation of this state

Abowd and Beale framework

extension of Norman…
their interaction framework has 4 parts

- user
- input
- system
- output



Using Abowd & Beale's model

- **Articulation**
  - –translation of the user's task language to the interface's input language
  - –Articulation error occurs when a user formulates or performs wrong actions.
  - –Example: A user types some text in MS Word and uses shortcuts to copy the selected text.
  - –Instead of copying, uses shortcut for delete
  - –Good v.s Bad Articulation

Using Abowd & Beale's model

- **Performance**
  - –translation of the input language to the system's core language
  - –The system perceives the actions, executes them, and updates the state..
  - –system fails to understand the intended actions or doesn't allow is Pefromance Error
  - –Example:Name or not a name?

Using Abowd & Beale's model

- **Presentation**
  – translation of the system's core language to the output language.
  –system has executed the actions, its state is updated
  –Example: Bad: Unable to install the application..
  –Good: Unable to install the application. Phone memory is full. Please empty some space and try again later.

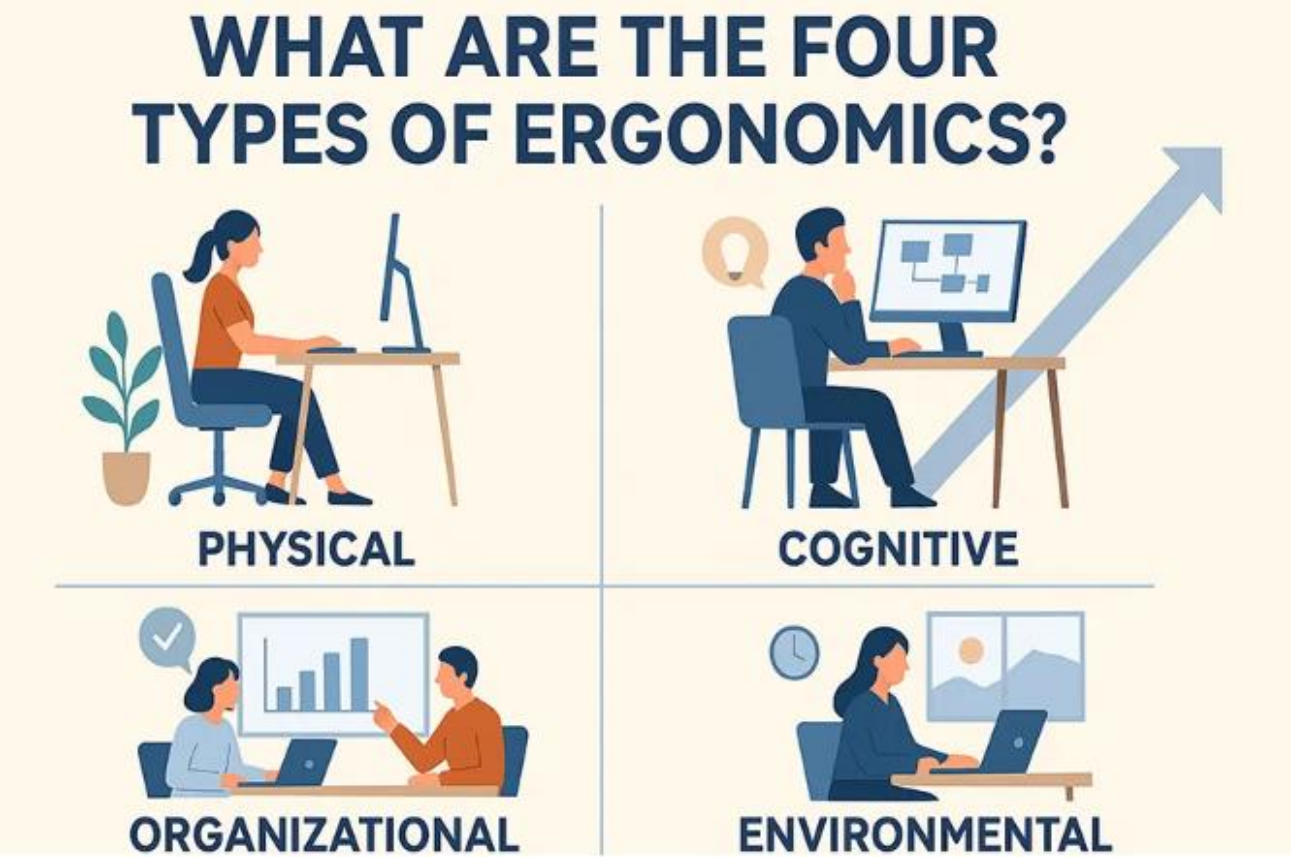
Using Abowd & Beale's model

- **Observation**
  - translation of the output language to the user's task language.
  - Example: The user observes the dialog box and clicks on the save and close option.
  - Bad: The user fails to pay attention and clicks on the close option.

ergonomics

Ergonomics

- Study of the physical characteristics of interaction
- Also known as human factors
- Ergonomics helps the designer to design an interface that enhances user performance.


WHAT ARE THE FOUR TYPES OF ERGONOMICS?
PHYSICAL
COGNITIVE
ORGANIZATIONAL
ENVIRONMENTAL

Ergonomics - examples

- arrangement of controls and displays
  - e.g. controls grouped according to function or frequency of use, or sequentially
- surrounding environment
  - e.g. seating arrangements adaptable to cope with all sizes of user
- health issues
  - e.g. physical position, environmental conditions (temperature, humidity), lighting, noise,
- use of colour
  - e.g. use of red for warning, green for okay, awareness of colour-blindness etc.

Why poor Ergonomics

- Ergonomics in Human-Computer Interaction Design

References

- What Are the Four Types of Ergonomics? – Official US Sihoo Store
- Ergonomics in Human-Computer Interaction Design
- Ch 3 , HCI, Alan Dix