

Chapter: 01 Human

Date: _____

The Human:

Information input output channels:

- visual, auditory, haptic, movement.

Information stored in memory:

- sensory
- short term
- long term.

Information processed and applied:

- reasoning
- problem solving
- skills
- Error

Interpreting other signals - (i) depth and sizes.

Visual Angle:

indicates how much of view object occupies.

Visual Acuity: Ability of perceiving details

(ii) Brightness:

(iii) Color

① Reading:

① Reading involves saccades and fixations.

② Perception occurs during fixation.

③ Word shape is important to recognition.

④ Negative contrast improves reading from computer screen.

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Saccades → type of eye movement rapidly from one point of interest to another.

fixation → Period of time where the eye is kept aligned with the target

- allows for the image details to be processed.

negative contrast → improves reading from computer screen.

Hearing

- Provides information about environment.
- Physical Apparatus: - inner ear - outer ear - middle ear.

Sound:

Pitch → Sound frequency

loudness → amplitude

timbre → type or quality).

humans can hear from 20Hz to 20kHz.

① **Auditory System filters sound:**

- Can attend to sound over background noise.

Touch:-

- important feedbacks about environment.
- key sense for visually impaired or blind.
- **Kinesthesia**: awareness of body position.

Stimulus received:

- > thermoreceptors \rightarrow heat & cold.
- > nociceptors \rightarrow pain
- > mechanoreceptors \rightarrow pressure.

Movement:

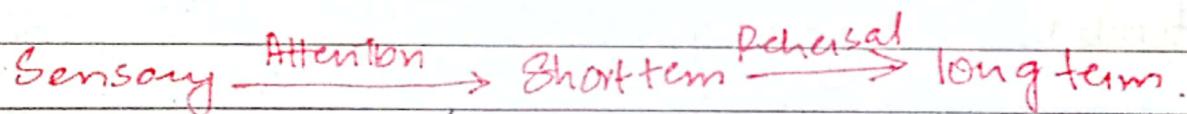
- > time taken to receive stimulus:
reaction time + movement time.
- > **Fitts law** describes the time taken to hit the screen target.

$$M_t = a + b \log_2 (D/S + 1)$$

M_t \rightarrow moment time.

D \rightarrow distance

S \rightarrow size.

Memory:

Sensory

Short term

long term.

-> iconics

-> scratch pad for temporary recall

-> repository for all our knowledge types:

= visual stimuli

-> echoic

(auditory) \rightarrow sense of hearing

-> Episodic: serial memory of events

-> haptic

(tactile) \rightarrow sense of touch

-> Semantic: structured memory of facts, concepts, etc.



long term Memory:

→ Forgetting:

Decay : loss of information gradually but slowly.

Interference :

Retroactive: new replaces old info

Proactive : old interfere with new info.

→ Retrieval

Recall: info reproduced ^{from} by memory by
Psychology or cues.

Recognition: info gives knowledge that it has
been seen before.

○ less complex than recall.

Thinking: (Reasoning)

-- Deduction:

derive conclusion from given info.

→ window ko dekh kr uski functionality pta karna.

~~Unreliable~~: can only prove false not true.

-- Abduction

→ conclusion se cause/reason tk jana.

Unreliable: can lead to false explanation.

-- Induction:

to retrieve info from cases seen to unseen.

→ Example: Exams.

→ can only prove false not true (unreliable)

~~Thinking~~

Problem Solving:-

- ° Process of finding solutions to unstructured tasks using knowledge.

Analogy mapping:

- ° Sem domain ki problem se guidance lena.
- ° Analogy mapping difficult if domains are semantically different.

Skill acquisition:

Errors:

Slips: right intention but failed to do it right.

-° benti krske by changing the interactive system. or metaphors.

Mistakes: wrong intention, incorrect understanding.

-° benti krske tutorial dkr.

Chapter 03 : Interaction.

terms of interaction:-

domain: the area of work

goal : what you want to achieve.

task : how you go about doing it.
basically steps jiske through goal achieve hoga.

Donald Norman's model :

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→ seven stages.

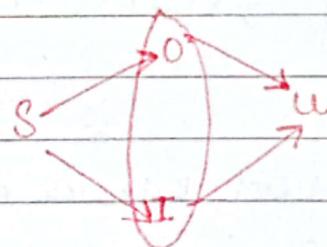
- ① User establishes the goal. ↗ goal
- ② formulates intention ↗ execution
- ③ specifies action at interface.
- ④ execution of actions ↗ execution
- ⑤ perceive system states.
- ⑥ interpret system state. ↗ evaluation
- ⑦ evaluation.

Gulf of Execution: user kch features add krna cha rha
User system allow nhi kr rha.

Gulf of Evaluation: user kch or output expect kr rha
System se or System wo output
nhi de raha.

Abowd & Beale Framework :-

- user
- Input
- System
- Output



Basically this interaction framework identifies system and user components which communicates via input and output components.

- Identifies all necessary components.
- Abstraction

Ergonomics:

- Study of physical characteristics of interaction.
- good at defining standards and guidelines for constraining the way we design certain aspects of system.

Examples:

○ Arrangement of controls and display.

○ Surrounding Environment.

○ Health issues.

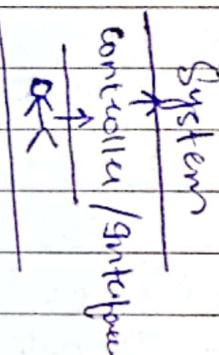
○ Use of color.

Indirect Manipulation:-

- manipulation of object using a controller.

- move it through cursor to move hand.

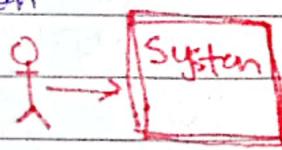
User → **interface** → real world



Direct Manipulation:-

- physically control karna kisi action system ko.

- example: mobile screen.



Common Interaction Styles:

Date:

① Command Line Interface,

- way of expressing instructions to the computer directly
- function keys, keys, single characters, abbreviations

example: Unix System.

② Menus:

- sets of options displayed on the screen.
- options visible → less recall.
- Selection by : numbers, arrows, key.
- often options hierarchically grouped.
- Restricted form of full WIMP System.

③ Natural Language

- familiar to user.
-

④ Query Interfaces:

- ① Q/A interfaces.
- ② Query lang. eg: SQL

⑤ FormFills.

for data entry or data retrieval.

⑥ Spreadsheets:

- example: MS Excel.

⑦ WIMP Interface:

① WIMP Interface:

Windows - Icons - menus - Pointers.
default styles for majority of interactive computer
System of PCs and Desktop

② Point and click interfaces:

Used in:

- multimedia - web browser - hypertext.
- ③ just click something.
- icons - text - location or map.

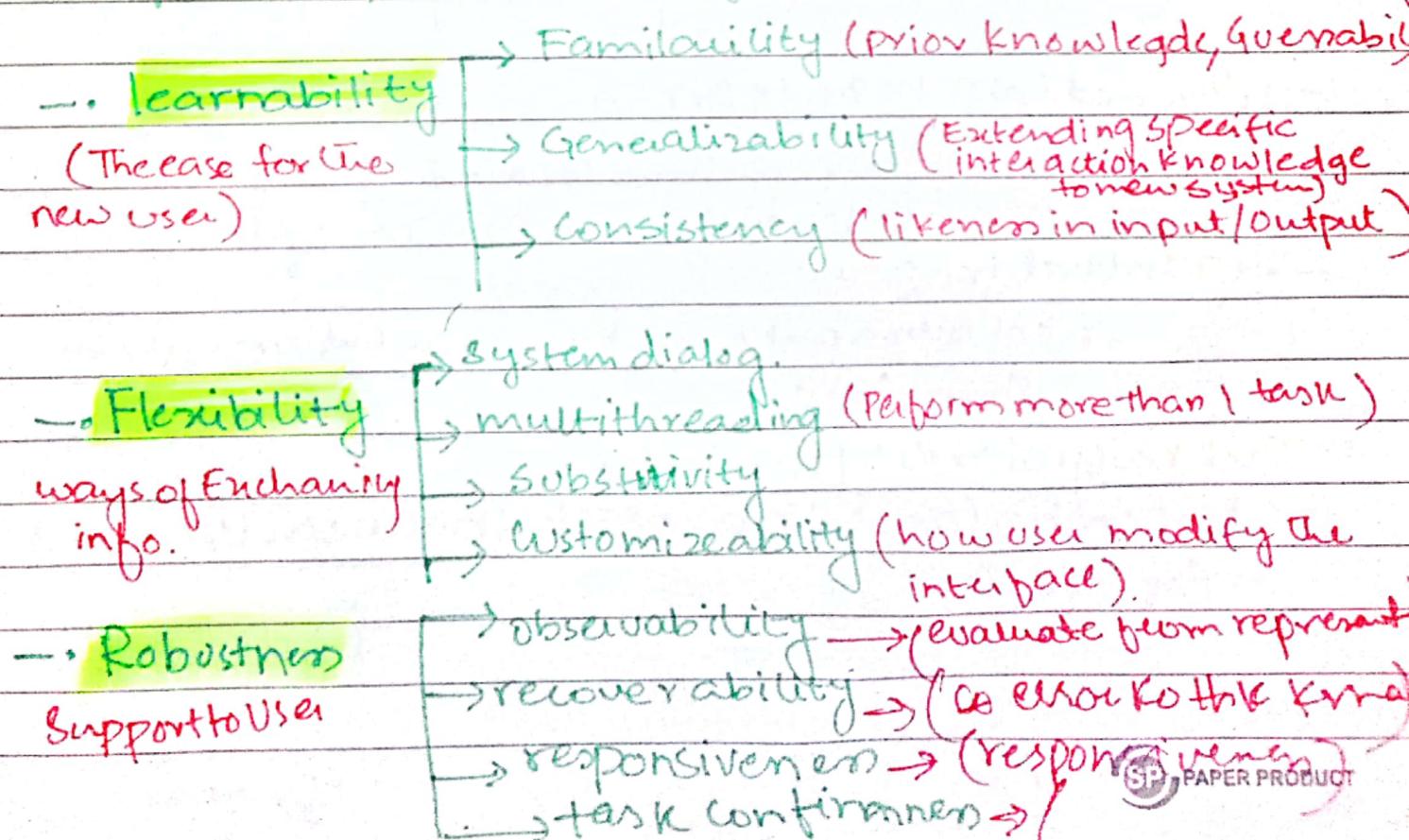
Chapter: 07

"The design Rules"

- Introduction
- Principles to support usability
- standards
- Guidelines
- Golden rules and heuristics.

Principles	Standards	Guidelines
- abstract design rules	- Specific design rules.	- low Authority
- low authority	- high Authority	- more general application
- high generality	- limited Application	

Principles to Support Usability:



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"The design Rules"

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- Standards
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- Golden rules and heuristics.

Principles

- abstract design rules
- low authority
- high generality

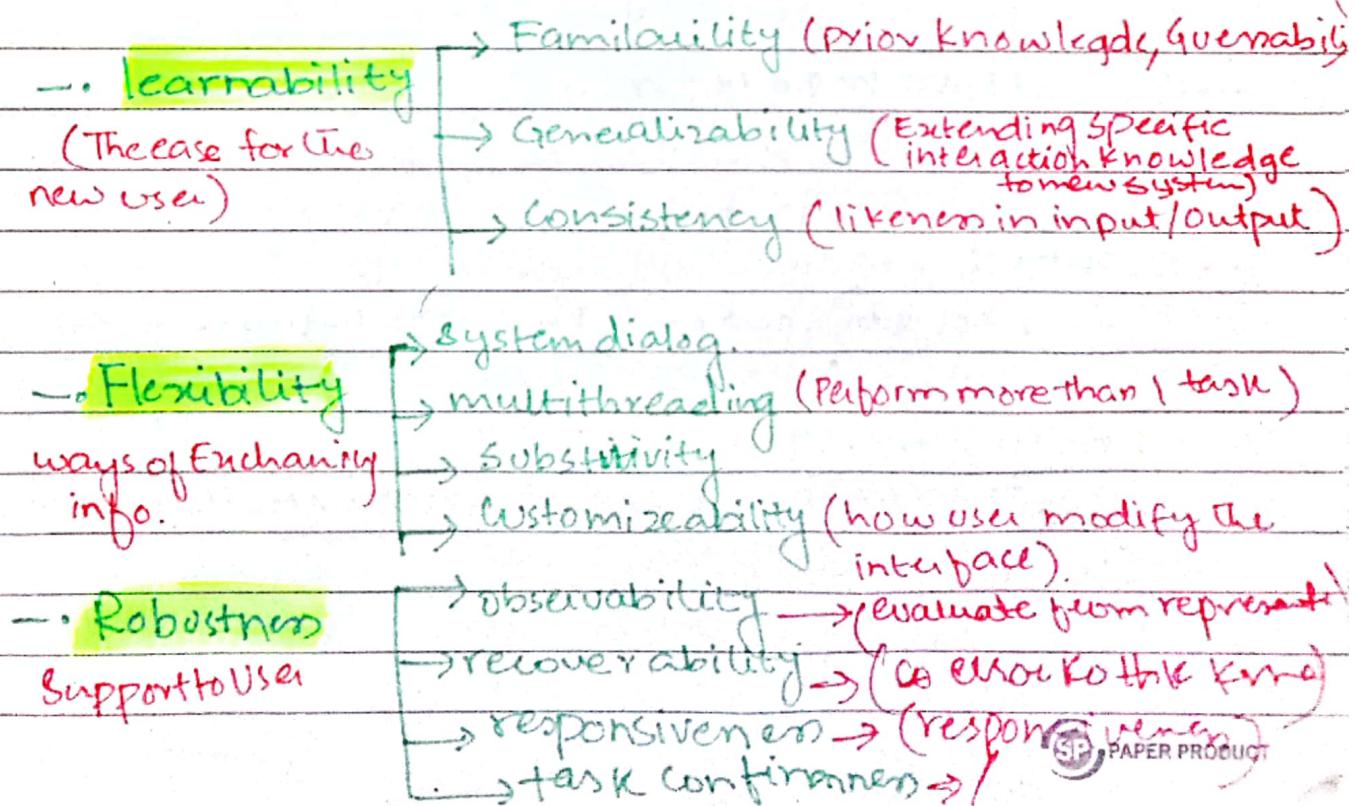
Standards

- Specific design rules.
- high Authority
- Limited Application

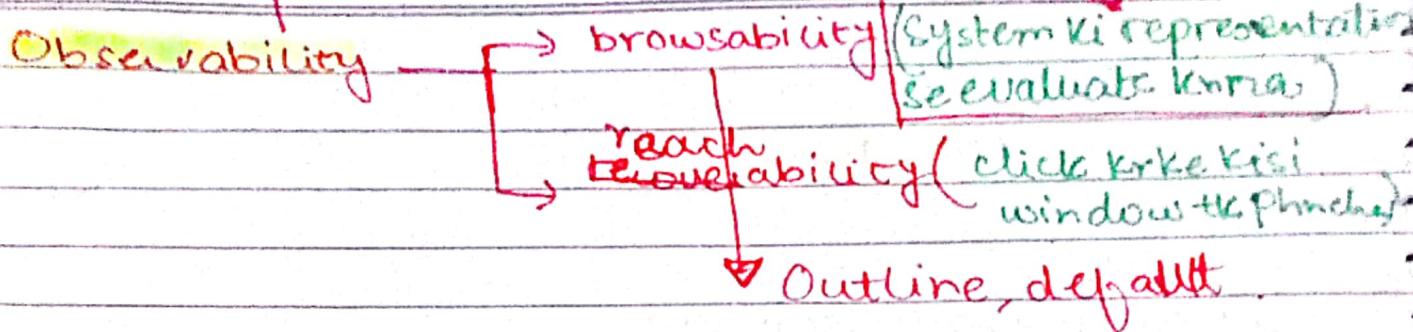
Guidelines

- low Authority
- more general application

Principles to support Usability:



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③ Task adequacy:

The task adequacy is concerned with addressing the user's understanding of these tasks.

• Predictability:

future actions of Kodetermine karma through Past action.

• Synthesizeability:

Accessing the effect of Past action.

• Immediate honesty:

- foran se show hona feedback.
- loading.....

• Eventual honesty:

- Koi Action perform Fren uska outcome foran show na ho.

④ Task migratability:

Responsive for task execution between user and System.

Shneiderman's 8 Golden Rules:

- 1) Consistency.
- 2) Shortcuts.
- 3) feedback.
- 4) Design Dialogue.
- 5) Error Prevention and Error Handling
- 6) Support internal locus of control.
- 7) Reduce short term memory load.
- 8) Easy reversal of Action

Norman's 7 principles:

- 1) Use both knowledge in the world and in the head.
- 2) Simplify the structure of Tasks.
- 3) Make things visible.
- 4) Get the mapping right.
- 5) Exploit the power of constraints.
- 6) Design for error.
- 7) When all design fails standardize.