HCI / Lecture 2

⇒ Fitt's law,

It describes the average time taken to hit a screen target.

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

where,

T_m = Movement Time (ms)

a & b are constants experimentally.

D = Distance

S = Size

Ex: Suppose for a 15-inch flat panel display, the average display, the average distance the cursor between the menu bars is 80mm. Size of menu bar - Macintosh 50mm & windows: 5mm. Here, a = 50, b = 150.

Calculate the time to move the cursor to a menu item on Macintosh.

Soln:

for Macintosh,

$$T_M = 50 + 150 \log_2(80/50 + 1)$$
$$= 256 \text{ ms}$$

for windows,

$$T_M = 50 + 150 \log_2(80/5 + 1)$$
$$= 663 \text{ ms}$$ Ans

Summer -2022 Q: "Consider a company that wants to develop a wireless information system to help tourists with Personal Digital Assistan (PDAs) at Cox's Bazar Airport. Develop a conceptual model for this system. Draw it.

Ans: Developing a conceptual model for a wireless information system to assist tourists in Cox's Bazar using personal digital ~~assistance~~ assistants (PDAs) involves understanding the users, their needs, and the context of use. The steps

and questions to consider when developing a ~~model~~ conceptual model:

1) ~~Identify users and stackholders~~
2) Define ~~system~~ objectives

1) Identify users and stackholders:

→ who are the primary users ~~of~~ the system
→ Are there secondary users or stackholders?
→ what are the ~~targeted~~ user group?
(For ex: Age, language etc.)

2) ~~What~~ Define System Objectives:

→ ~~What~~ are the main goals of the system (Provide relevant information ~~to tourists~~, facilitating navigation etc.)

→ How does the system align ~~it~~ with the overall goals of the company and needs ~~of~~ of the users?

3) Contexts of use:

→ When and where will tourists be using the system? (Streets, public transportation etc.)

→ What are the environmental conditions? (Noise level, lighting)

→ How will tourists be carrying and interacting with the PDAs?

4) User Tasks and Activities:

→ What tasks do tourists want to acomplish using the system? (finding attractions, getting directions, language translation, local recommendations)

→ How do these tasks fit into the overall tourists experience.

5) User Interaction:

→ How will users interact with the PDAs? (Touchscreen, voice commands etc).

→ What kind of feedback will the system provide to users? (visual, auditory).

6) Information Presentation:

→ What information is essential for tourists? (Maps, local events, safety tips).

→ How should the information be organized and presented to enhance user understanding and engagement.

7) Privacy and Security:

→ How will the system handle user data? (Privacy policies, data encryption)

→ What security measures are in place to protect users and their information.

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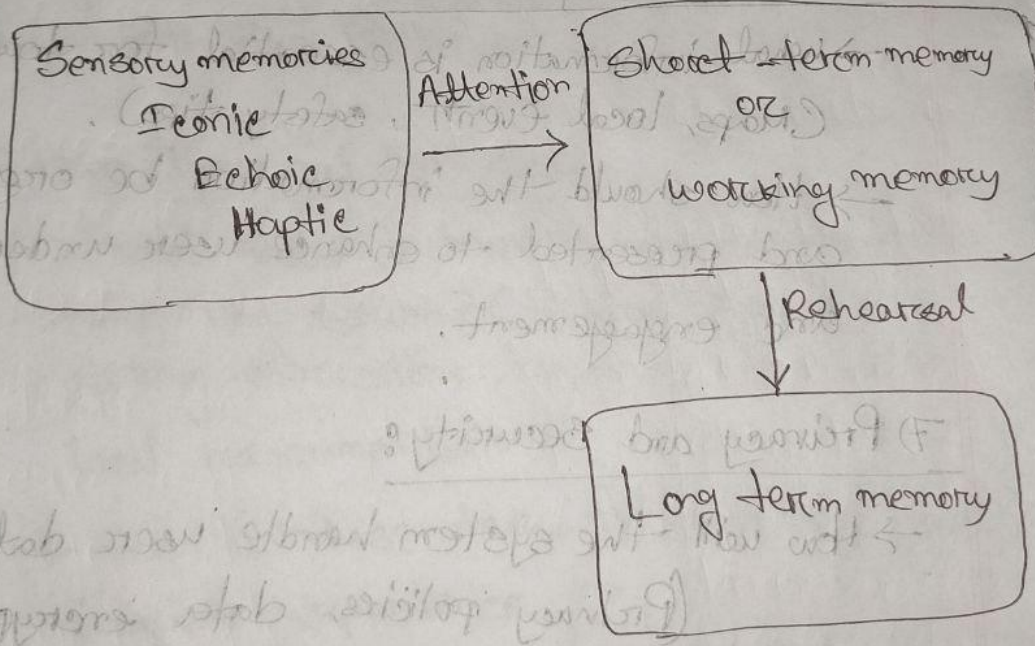
Summer -2022 Q: Draw the block diagram of memory model. How ~~the~~ information goes to long-term memory? How chunking improves memory?

Ans:

Block Diagram of Memory Model:



Long-term memory hold information for long time, although not all information can be reetrieved daily.

Here's how chunking can enhance memory in HCI:

1) It helps in breaking down information into smaller.

2) By organizing meaningful chunks, users can more easily recognize patterns

3) When information is presented in Chunks, users find it easier to recall and recognize.

4) It helps error prevention.

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Summer 2022

Q: what do you see? "constructive theory states that context plays a majore role in what we see in an image". how?

Ans: we cannot see. Because -

1) The image is too blurry

2) we had no idea what to expect because there was no context.

Heres how context plays a majore role in an image:-

1) Interpretation: Context helps users derive meaning from an image. It provides cues and additional information that guide our understanding of the visual content. For example, an image of a tree might be perceived differently depending on whether it's shown in the context of a forest or a concrete jungle.

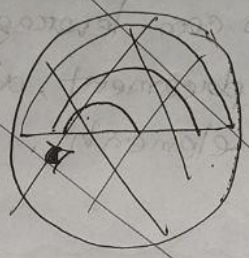
2) Expectations: Context sets expectations for what we anticipate the image to depict. HCI designers can leverage this by carefully choosing the placement, alignment and surrounding elements.

3) Emotional response: Contextual information can evoke specific emotions or influence our ~~the~~ emotional response to an image.

4) Accessibility: Context can be crucial in ensuring accessibility for users. By providing alternative text or captions, HCI designers ~~the~~ make images accessible to individuals with visual impairments or those who rely on screen readers.

Summer -2022 Q: Explain "Human Model" by Card, Moran, & Newell with figure.

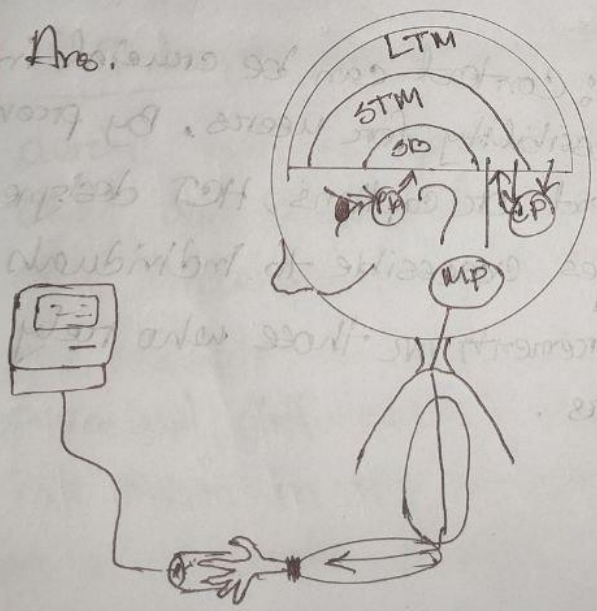
Ans:



LTM = Long Term Memory
STM = Short Term Memory
SB = Sensory Buffer

Q: Explain "Human Model" by Card, Moran Summer -2022 & Newell with figure.

Ans.



LTM = Long Term Memory
STM = Short Term Memory
SB = Sensory Buffer
PP = Perceptual Processor
CP = Cognitive processor
MP = Motor Processor

Comprise 3 interacting systems:

1) Perceptual system consists of sensors & associated buffer memories.
   - Visual image store
   - Auditory image store

2) Cognitive system consists of short-term & long-term memories.

3) Motors system carries out response formulated by cognitive system.

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Q8 "A healthy office chair", how it is important for a users and a company? what are the others things in the office that may help to improve our efficiency you think?

Ans:

Importance of healthy office chair:

1) User comfort and well being: Healthy office chair is crucial for user comfort and well-being. User spend extended periods sitting at their desks, and an ergonomic chair supports proper posture, reducing the risk of discomfort.

2) Productivity and focus: Comfortable seating contributes to increased productivity and focus.

3) Prevention to health issues: Ergonomic chairs help prevent health issues such

as back pain, neck strain and repetitive strain injuries.

4) Employee Satisfaction: Provide a healthy office chair demonstrates a company's commitment to employee well being.

5) Long-term cost savings: Investing in ergonomic office chairs can lead to long-term cost savings for the company.

Other factors to improve office efficiency:

1) Proper adjustable desks
2) Proper lighting setup
3) Measure noise control level
4) Dual monitors for multitasking
5) Effective collaboration tools.
6) Personalize users workspace
7) Task specific tools and softwares.

Summer -2022

Q: Explain gestalt psychology. Use some examples with figures.

Ans: Gestalt psychology is a thought that looks at the human mind and behavior as a whole.

It consists of some meaningful units using:

1) Proximity: we group by distance or location.

2) Similarity: we group by type

3) Symmetry: we group by meaning

4) Continuity: we group by ~~follo~~ flow of lines (alignment).

5) Closure: we perceive shapes that are not (completely) there.

Principle of Proximity

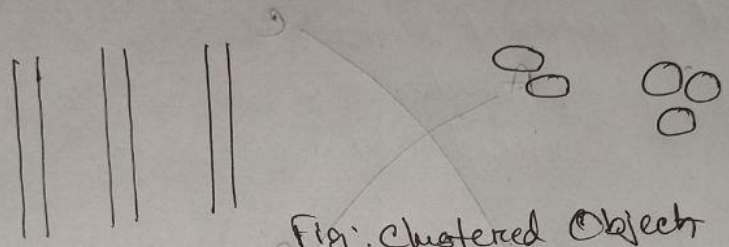


Fig: Clustered Objects

Principle of Similarity:

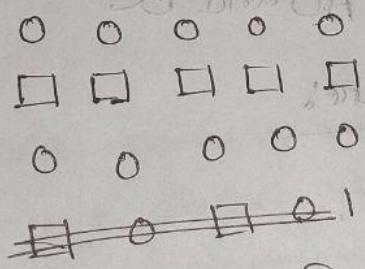


Fig: Rows of similar objects

Principle of Symmetry:

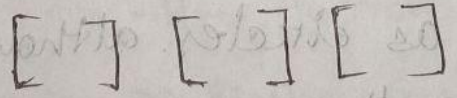
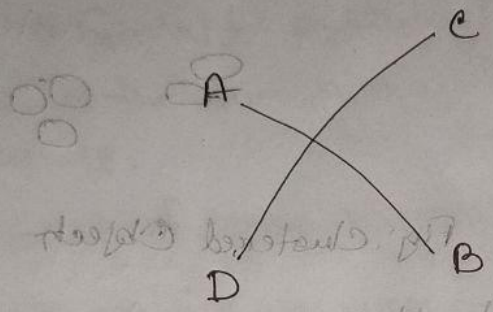


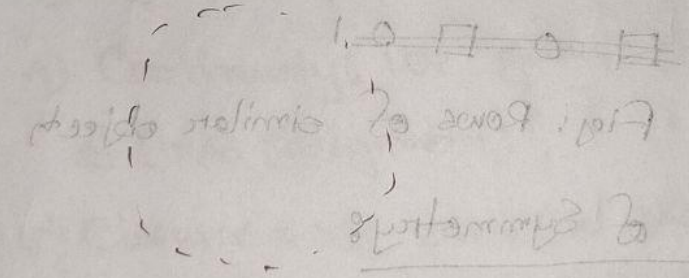
Fig: Three groups of paired square brackets.

Principle of Continuity:



We see curves AB and CD, not AC and DB, and not AD and BC

Principle of closure:



All are seen as circles although they are not exactly.