

Assignment No. 1



Q.1(a) Discuss the model of the structure of human memory with diagrammatical illustration.

→ There are three types of memory or memory functions:

- (1) sensory buffers or Sensory memory.
- (2) short term memory.
- (3) long term memory.

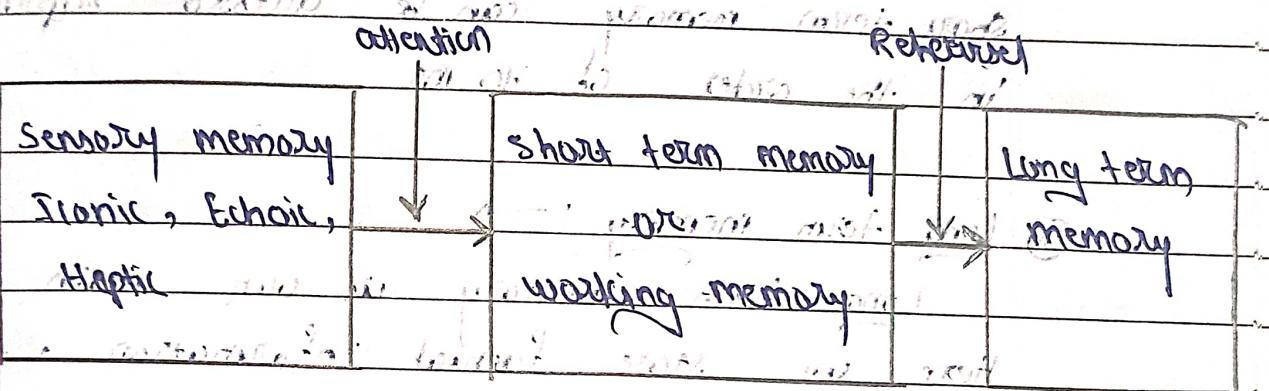


Fig: A model of the structure

of human memory.

① Sensory memory:

The sensory memories act as buffers for stimuli received through the senses. A sensory memory exists for each of sensory channels: iconic memory for visual stimuli, echoic memory for aural stimuli and haptic memory for touch stimuli.

These memories are constantly overwritten by new information coming in. These channels: attention is the concentration of the mind on one out of a no. of competing stimuli or thoughts.

② Short term memory: → When we are born (0-10)
short term memory is also called
working memory. It is temporary memory which
is temporarily stored in memory.
It acts as a scratch pad for temporary
recall of information. Computer has limited capacity
short term memory can be accessed rapidly
in the order of 30 ms.

③ Long term memory: →

Long term memory is our main resource.
Here we store factual information, experiential knowledge, procedural rules of behaviour. It has relatively slow access time of approx. a tenth of a second. The forgetting occurs in more stages in long term memory.

Information is placed there from working memory through rehearsal. There are two type of long term memory: Episodic memory represent our memory of events and experiences in a serial form and semantic memory is a structured record of facts, concept and skills that we have acquired. For man and animal

(Q.1.b) List and explain the stages of Norman's model of interaction with the system.

→ Norman's model of interaction is known as the execution-evaluation cycle. It is the most influential model. According to this model, the user first establishes the goal and then executes actions to achieve that goals using the system interface.

The norman's model can be divided into 2 major phases: execution and evaluation.

These can then be subdivided into further 7 stages:

- ① Establishing the goal
- ② Forming the intention
- ③ Specifying the action sequence
- ④ Executing the action
- ⑤ Perceiving the system state
- ⑥ Interpreting the system state
- ⑦ Evaluating the system state with respect to the goal and intention.

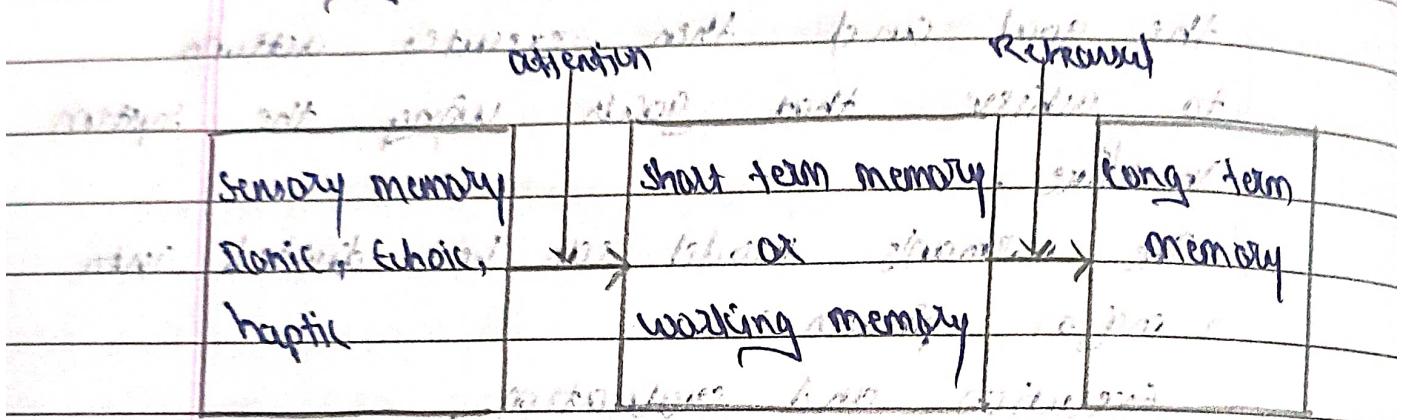
Q.26) With diagrammatical illustration explain the model of the structure of human memory.

→ There are three types of memory:

① Sensory buffers

② Short term memory

③ Long term memory



Explain the diagram of the structure of human memory.

① Sensory memory:

The sensory memory acts as buffers for stimuli received through the sense organs. Sensory memory exists for each sensory channel: iconic memory for visual stimuli, echoic memory for aural stimuli, and haptic memory for touch.

These memories are constantly overwritten by new information coming in on these channels.

... and how our brain controls memory (1-3)

② short term memory : → 30s - 1 min

It is also called ~~minor~~ temporary memory or working memory which is temporarily stored in ~~memory~~ ~~storage~~ ~~most people~~

It acts as a ~~storage~~ pool for temporary recall of info. It has a limited capacity. short term memory can be accessed rapidly in the order of 70 ms.

③ long term memory : → 1-100 years (1)

long term memory is our main resource. Here we store factual information, experiential knowledge, procedural rules of behaviour. It has ~~relatively~~ slow access time of approx 10-100s of ms. Second part 100-1000s

The information is placed there from working memory through rehearsal.

1st part 10-100ms

and 10-100s (2)

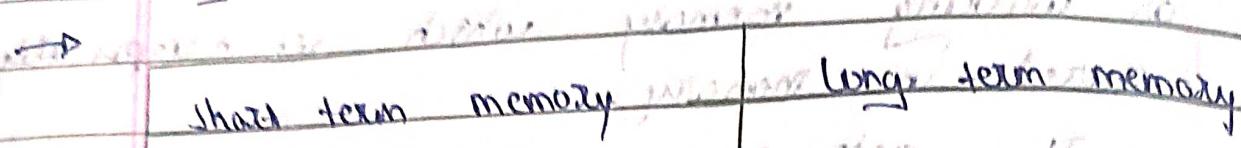
memory of having seen something in

rehearsed to convert it into a meaningful structure

learning involves

rehearsal

(P.2.a) Distinguish between short-term and long-term memory. State requirements to perform cognitive walkthrough of a system.



① A type of memory that allows storing data temporarily

A type of memory that allows storing data permanently

② The capacity of short-term memory is small without any rehearsal

The capacity of long-term memory is unlimited.

③ Chunking can improve short-term memory

Rehearsal and repetitive tasks enhance long-term memory.

④ For ex. RAM

For ex. Hard drives

The requirements required to perform cognitive walkthrough of a system are as follows:

- ① information processing
- ② capabilities
- ③ limitations
- ④ cooperative working
- ⑤ performance prediction.

Q.3a) Describe the usability engineering in detail.

- ① The term, usability engineering describes a user-centered process of user interface development. Sometimes referred to as user centered design.
- ② It is a lifecycle process that puts an early emphasis on user and task analysis and actual user involvement in the design and testing of a product.
- ③ A usability engineer works hand-in-hand with customer, working to develop a better understanding of the functionality and design requirements of a product in order to build more reliable data for it.
- ④ The 20 main points of usability measuring are:
 - a) Time to complete the task
 - b) Percentage of task complete
 - c) Percentage of task completed per unit time.
 - d) Ratio of success to failure.
 - e) Time spent in errors
 - f) percent for no. of errors
 - g) percentage or no. of competitor better than it.
 - h) number of command used in task
 - i) frequency of help and documentation used
 - j) percentage of favourable and unfavourable user comment
 - k) No. of repetition of failed commands
 - l) No. of runs of success and failure
 - m) No. of time interface misleads the users
 - n) No. of good and bad features received by users

- a) No. of available commands that not remove.
- b) No. of users preferring your system.
- c) No. of times user need to work around problems.
- d) No. of time user is diverted from work task.
- e) No. of time user logs the control of system.
- f) No. of time user express satisfaction (or frustration).

(Q.35) Elaborate the concept of interaction design.

process in which we make system

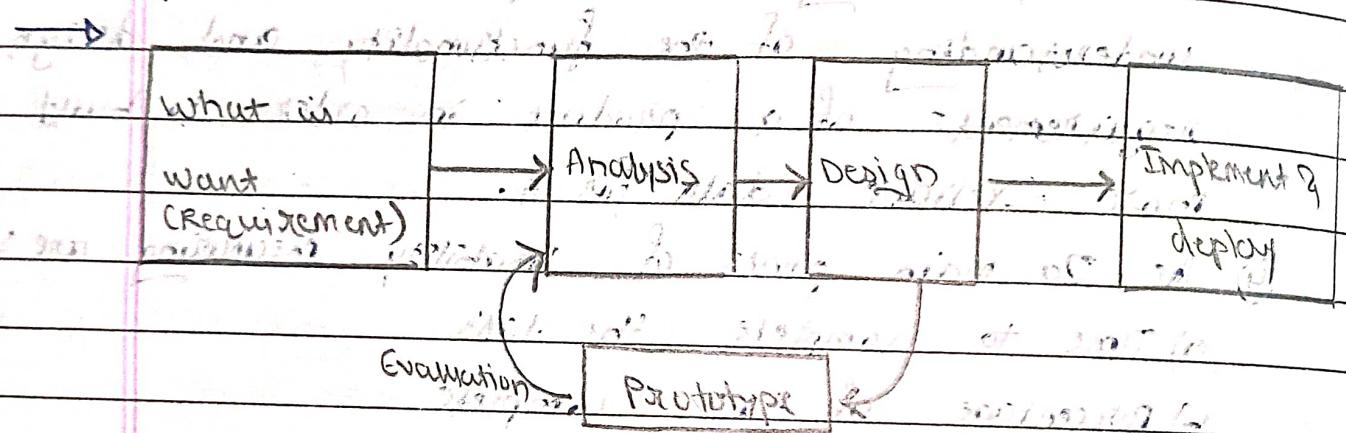


Fig: Interaction design process

① Requirement →

what is wanted? The first stage is establishing what exactly is needed, as a precursor to this it is usually necessary to find out what is currently happening.

② Analysis →

The results of observation and interview need to be ordered in some form to bring out key issues and communicate with later

Stages of design.

③ Design → Design involves the creation of a

There are numerous theories, guidelines and design principles which can be used to help with this.

④ Iteration and prototyping →

Humans are complex and we cannot expect to get designs right first time. We therefore need to evaluate a design to see how well it is working and where there can be improvements.

⑤ Implementation and deployment: →

Deployment refers to the actual release of a product into the real world. It is the process by which the document types, model and overall project definition are made available for use.

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Implementation and deployment are dependent

on how good the design against requirements

right now and what can be done to improve it.

P.4(a) Explain in details about iterative design and prototyping.

→ A prototyping is a conflict representation of the all interactive system. A prototype is tangible, artifact or model and not a detailed description of the project.

Low Fidelity (Lo-Fi)
(paper prototype)

- * Brainstorm different representations through interface style.
- * Task centered walk-through and design critique

Medium Fidelity
(screen prototype)

- * Fine tune interface, screen design
- * Heuristic evaluation and redesign

High Fidelity (Hi-Fi)
restricted (working
with system)

- * Usability testing and redesign
- * Testing

Late design

Prototyping are experimental and incomplete design which is cheaply and fast developed.

It can divided into three types

① W-Fi: →

It is mainly about paper based prototyping
markup, there are quickly constructed to
depict concept design and screen layer.
It just demonstrate the general look of
interface. Tools used in Loft is paper & pen.

③ medium - fidelity: →

It is mainly about fine tune interface and screen design to evaluate the design.

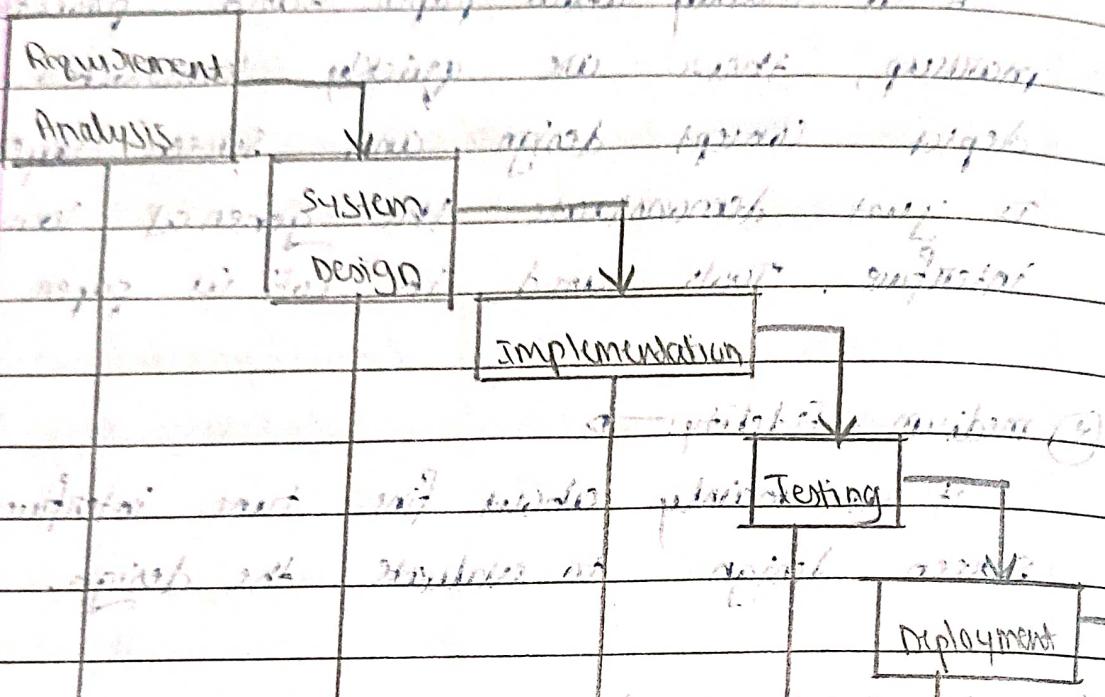
③ High Fidelity : →

It is mainly about computer based stimulation.
It is fully functional and attractive. we
can operate the prototype or even perform
some real task with it that are
"naturerally" easy to do, because we do
it themselves. we can get the time at
home with no difficulty and so
it mainly depends on

Die Stadtjugend ist weiterhin ausgeweitet.
Mit der 10. Februar 1945 wurde die Stadtjugend um
die Landjugend nicht nur ausgeweitet und vergrößert
ausgeweitet sondern auch ausgeweitet und ausgeweitet.

(Q.4b) Discuss about the activities in waterfall and of software life cycle.

→ Waterfall Model



initial phase and final phase

Fig: waterfall life cycle

The waterfall approach was first used to be used widely in software engineering to ensure success of project. The whole process of software development is divided into separate phases:

① Requirement Gathering & Analysis: →

All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

→ This allows efficient software development.

② System Design : →

This helps in specifying hardware and system requirements and helps in defining the overall system architecture.

→ Following are the necessary factors:

③ Implementation : →

The system is first developed in small program called units, which are integrated in the next phase. Each unit is developed and tested for functionality, which is referred as unit testing.

④ Integration & Testing : →

All the units developed in the implementation phase are integrated into the system after testing. post integration the entire system is tested for any faults and failures.

⑤ Deployment of system : →

Once the functional and non-functional testing is done ; the product is deployed in the customer environment or released into the market.

⑥ Maintenance : →

There are some issues which come up in the client environment. To fix these issues, patches are released.

Q.5(a) Explain the cognitive models and its classification.

→ (1) cognitive modelling is an area of computer science that deals with simulating human problem-solving and mental processing in a computerized model.

(2) cognitive model represents users of interactive systems

(3) it is classified into three models:

a) hierarchical model.

b) linguistic model.

c) physical model.

(i) Hierarchical Model:

It is based on goals and tasks also called goals structure, which is to predict quantitative time and quantity use of for expert users. It includes the following model:

l - actions, o - operators, m - methods

L - selection, O - control, M - control

(ii) Linguistic model:

Linguistic model is based on how to interact with system. different mind or in a way to interact. some performance

particular BNF and TAL

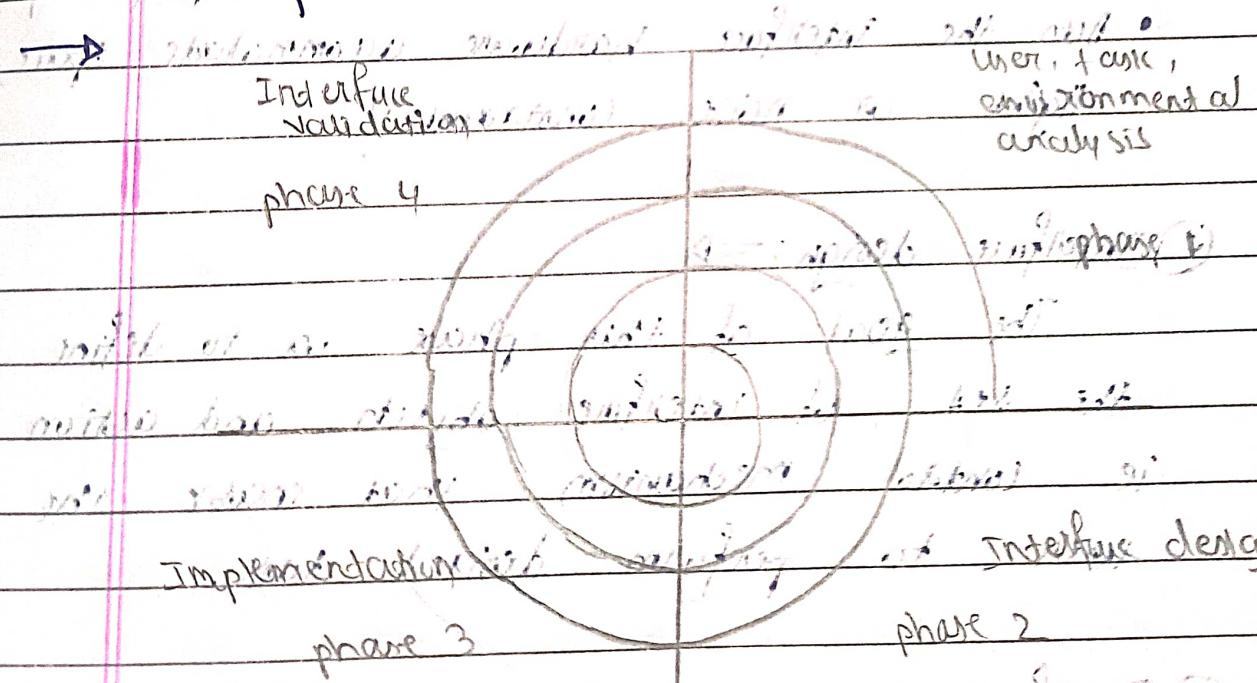
BNF (Backus Naur Form)

TAL (Text Action grammar)

Q. 5(a) physical model: → to convey concept w/
. It is based on choice of media
performance criteria in which a single click of
mouse button, double click, long press
are performed. And it is not
easy to edit data. New data need
to be integrated with old

Q. 5(b) consider the case of preparing a group presentation for a software project. Elaborate the stages in specifying and designing

following four phases in the work.



a combination of activities such as

defining problem requirements w/
and work figure the interface design phases

for example 3rd and 4th quadrant

The design process of U.I. is iterative and can be represented by a spiral model.

① user, task, environmental analysis and modelling:

The focus is based on the profile of users who will interact with the system. From each category requirements are gathered - based on requirements developer understand how to develop the interface.

This includes:

- where will the interface be located physically?
- Does the interface hardware accommodate space, light or noise constraints?

② Interface design:

The goal of this phase is to define the set of interface objects and action i.e. control mechanism that enable the user to perform desired task.

③ Interface construction & implementation:

The implementation activity begins with the creation of prototype that enables usage scenarios to be evaluated.

(4) Interface validation : →

This phase focuses on testing the interface. The interface should be designed such a way that it should be able to perform tasks correctly and it should be capable of handling a variety of tasks. Users should accept the interface as useful one in their work.

Q. (a) Explain the concept of key stroke level model.

- (1) In human - computer interaction, the key stroke level model (ksm), predicts how long it will take to accomplish a task in terms without errors using an interactive computer system.
- (2) It was developed by Stuart K Card, Thomas P.
- (3) The key stroke level model is a simple tool that allows a designer/researcher or engineer to predict or estimate how long it will take to complete a task in their software.
- (4) The model is composed of six elements or operators and follows:

- a) K = key stroke or button press
- b) P = pointing with a mouse
- c) H = holding the hands on keyboard
- d) D = manually drawing has problem
- e) M = mental preparation
- f) R = System response time

(Q.6 b) Describe the socio - organization issues and stakeholder requirements.

→ * Socio organization issues: →

(1) Socio-organization issues: →

It includes organizational issues, affect acceptance in which conflicts and power were determined, benefits and encouraging users included.

(2) stakeholder:

It defines their requirement in organizational context.

(3) socio technical models: →

In which human and technical requirement are defined.

(4) soft system methodology:

In this broader view of human



organizational issues are described.

⑥ participatory design:

It includes the user directly in the design process.

⑦ Ethnographic method:

In this, we study user in context & unbiased perspectives.

* Stakeholder requirements: →

It often referred to as user needs or user requirements, describe what users do with the system, such as the activities that users must be able to perform. The main stakeholder requirement are:

- ① Define decision about business needs.
- ② Involve
- ③ Objectives from the perspective of the stakeholder and their role in the business.