Menu drive Interface: when an UI uses a menu of option to navigate a program or website is known as a menu driven UI.

⇒ Understanding & Conceptualizing Interface:
In the process of creating interactive product it can be tempting to begin at the 'nuts & bolts' level of the design which means how to design the physical interface & what interaction styles to use.
A problem with trying to solve a design problem beginning at this level is that critical usability goals & user needs may be overlooked. It is certainly necessary at some points to decide on the design of physical aspects. It could be better to make these kinds of design decisions after understanding the nature of the problem space:

1) Conceptualizing what you want to create & articulate why you want to do so.
2) This requires thinking through how your design will support people in their everyday or work activities.
3) Need to ask yourself whether the interactive product you have in mind will achieve & How?

Conaptual Model:

The proposed system in term of a set of integrated ideas & concepts about what it should do, behave & look like, that will be understandable by the users in the manner intended.

Following be the steps in formulating a conceptual Model:

- What will the users be doing when carrying out their tasks.
- How will the system support these.
- What kind of interface metaphor, if any, will be appropriate?

Conceptual Models based on Activities:

1) Giving Instruction:
When user issue instruction to a system. This can be done in a number of ways including; typing in command, selecting options from menus in a windows environment or on a touch screen, speaking aloud commands, pressing buttons or using a combination of function keys.

2) Conversing:
where users have a dialog with a system. Users can speak via an interface or type in questions to which the system replies via text or speech output.

Manipulating:
Users interact with objects in a virtual or physical space by manipulating them. Eg: opening, holding, closing, placing.

Exploring:
Where users move towards through a virtual environment or a physical space. Virtual environments include 3D worlds & virtual reality system.
physical spaces that use sensors-based technologies include smart rooms & ambient environments, also enabling people to capitalize of familiarity.

Core Principles of DM:
- Continuous representation of objects & actions of interest.
- physical actions & button pressing instead of issuing commands with complex syntax.

Why Direct Manipulation (DM) interfaces are enjoyable?
- Experienced users can work extremely rapidly to carry out a wide range of tasks, even defining new functions.
- Users Experience less anxiety.
- Users gain confidence & mastery & feel in control.

4 Exploring & browsing:
Similar to how people browse information with existing media. (Eg: newspapers, magazines, libraries etc). Information is structured to allow flexibility in the way a user is able to search for information.

Activity:
⇒ Understanding User's Conceptual Cognition
* Cognition is what goes on in your head when we carryout everyday activities which involves cognitive process like thinking, remembering, day dreaming
Normath distinguish between 2 general modes Experimental & Reflective cognition. In Experimental it perceive, act & react to events around us effectively & effortlessly.
* It requires reaching a certain level of expertise & engagement.
Eg: Driving a car, reading a book etc.
In Reflective Cognition it involves thinking, Comparing & decision-making.
* This kind of cognition leads to new ideas & creativity.
Cognition has some kind of processes which is as follows:
1) Attention, 2) Perception & recognition, 3) Memory
4) Learning 5) Reading, 6) Problem solving

1) Attention: It is the process of selection things to concentrate on, at a point in time, from the range of possibilities available. Attention involves our auditory &/or visual senses.
Example of Auditory attention is waiting in the dentist's waiting room for our name to be called out to know when it is our time to go in.
Example of visual attention is scanning the football results in a newspaper to attend to information about how our team has done.
The process is easy or difficult is depend on: i) whether we have a clear focal or ii) whether the information we need is salient in the environment.

i) If we know exactly what we want to find out we try to match this with the information i.e available.
for Ex: if we landed at an airport after a long flight & want to find out who had won the world cup, we might scan the headlines at the newspaper stand, or check the web, call a friend. When we aren't sure exactly what we are looking for we may browse through information

iii) Information Presentation: The way information is displayed can also greatly influence how easy or difficult it is to attend to appropriate pieces of information.

2 Perception: Refers to how information is acquired from the environment, via the different sense organs. Eg: eyes, ears, fingers & xformed into Experiences of objects, events, sounds & tastes. It is complex, involving other cognitive processes such as memory, attention & language.
Vision is the most dominant sense for sighted individuals, followed by hearing & touch. With respect to interaction design it is important to present information in a way that can be readily perceived in the manner intended.

3) Memory: involves recalling various kinds of knowledge that allows us to act appropriate-ly. It is very versatile, enabling us to do many things.
for Ex: it allows us to recognize someone's face, remember someone's name, recall when we last met them, & know what we said to them last
GUIs provide visually-based options that

* Users can browse through until they recognize the operation they want to perform. Likewise, web browsers provide facilities for displaying list of URL's that have been visited. This means that users has to only recognize a name of a site when scanning through a list of URLs.
* A filtering process is used to decide what information gets further processed & memorized. This filtering process however isn't without its problem. In filtering, initially, encoding takes place determining which information is attended to in the environment & how it is interpreted. The extent to which it take place affects our ability to recall that information later.
Instead of requiring users to recall from memory a command name from possible sets of hundreds & thousands.
* GUI's provide visually-based options that users can browse through until they recognize the operation they want to perform. Web browsers provide facilities for displaying list of URL's that have been visited.

PIM & File Management Example along with memory load & Password.

4) Learning:
Learning can be considered in terms of i) how to use a computer-based application or ii) using a computer-based application to understand a given topic.

* It is very hard to learn by following a set of instructions in a manual. Instead, they much prefer to 'learn through doing'. GUIs & direct manipulation interfaces are good environments for supporting this kind of active learning
* One of the main benefits of interactive technologies such as web-based, multimedia & virtual reality, is that they provide alternative ways of representing & interacting with information that aren't possible with traditional technologies eg. books, videos

5) Reading, Speaking & Listening:
Three forms of language processing that have similar & different properties. One similarity is that the meaning of sentences or phrases is the same regardless of the mode in which it is

conveyed. Some users prefer reading to listening while others prefer listening many application have been developed either to capitalize on people's reading, writing & listing skills.
for Eg:
- Interactive books, web based material that help to read or read foreign languages.
- speech recognition systems that allow users to provide instruction via spoken cmd for Eg: word processing dictation, home control devices that respond to vocalized requests.

Cognitive Frameworks:
There are several of conceptual frameworks have been developed to explain & predic users behaviour based on theories of cognition. Following be the list of it that have been developed for interaction design which are as follows:
- Mental models.
- Information Processing.
- External Cognition.

Mental Models

Mental Models are used by people to reason about a system, & in particular to try to fathom out what to do when something unexpected happens with the system.
Eg: TV engineers have a 'deep' mental model of how TVs work that allows them to work out how to fix them.
many people's understanding of how computer based technologies & services.
Eg: the Internet, wireless networking, broadband, search engines, Viruses, work is poor.
As a consequence it is difficult to identify describe or solve a problem. If users could develop better mental models of interactive systems they would be in a better position to know how to carry out their task efficiently. if interactive technologies could be designed to be more transparent they it might be easier to understand them in terms of how they work & what to do when they don't. Transparency involves including:

- useful feedback in response to user input
- Easy-to-understand & intutive ways of interacting with the system.
- Clear & easy-to-follow instructions.

- appropriate online help & tutorials.

2) Information Processing:
IP is another approach to conceptualizing how the mind works has been to use metaphors & analogies.
One prevalent metaphor from cognitive psychology is the idea that the mind is an information processor.

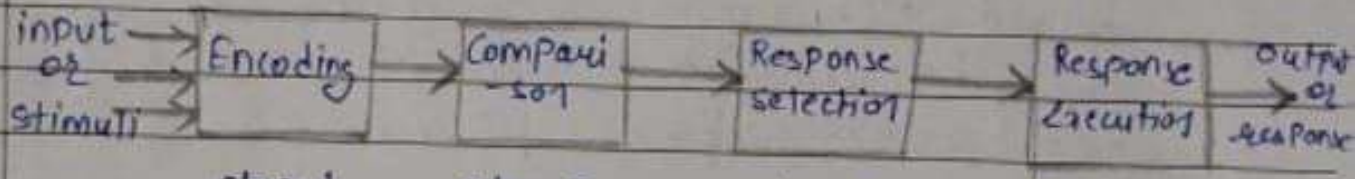

Figure. Human Information Processing Model

Information is thought to enter & exit the mind through a series of ordered processing stage which is shown in figure. within these stages, various processes are assumed to act upon mental representation. Processes include comparing & matching. mental representation are assumed to comprise images, mental models, rules & other forms of knowledge.

External Cognition:
People interact with or create information through using a variety of External representations, Eg: books, multimedia, newspaper web pages, maps & so on.
The combination of External representation & physical tools have been developed throughout history to aid, cognition, including Pens, calculators & computer-based technologies & physical tools has greatly extended & supported peoples ability to carry out cognitive activities.
Following be the ones which includes:
1) Externalizing to reduce memory load.
2) Computational offloading
3) Annotating & cognitive tracing.

1) Externalizing to reduce memory load.
A number of strategies have been developed for transforming knowledge into External representations to reduce memory load. One such strategy is externalizing things we find difficult to remember, such as birthdays, appoinments & address.
Cognitive tracing is useful in situations where the current state of play is in a state of flux & the person is trying to optimize their position.

A number of computer-based applications have been developed to reduce the burden of people to remember things, including web-based to-do list services

2) Computational offloading:
Computational offloading occurs when we use a tool or device in conjuction with an external representation to help us carry out a computation.
Eg: Using pen & paper to solve a math problem.

3) Annotating & cognitive tracing:
Externalizing our cognition is by modifying representations to reflect changes that are taking place that wish to mark.
for Eg: people often cross things off in a to-do list to show that they have been completed.
They may also reorder objects in the environments by creating different piles as the nature of the work to be done changes.
- Annotating involves modifying external representation such as crossing off or underlining items.
- Cognitive tracing involves externally

manipulating items into different orders or structures.

* Annotating is often used when people go shopping. people usually begin their shopping by planning what they are going to buy. Many people are aware that they won't remember all this in their heads & so often externalize it as written shopping list.
when they actually go for shopping at the store, they may cross off items on the shopping list as they are placed in the shopping basket or cart.
* Annotated externalization, allowing them to see at a glance what items are still left on the list that need to be bought.