

1. Explain different usability testing methods

The various types of usability ^{testing} include

- (i) Paper mockups and prototyping:

The usability studied carried out in early stages using paper mockups of screen displays produces user responses towards wording, layout and sequencing. Typically, the test administrator behaves as a computer by changing the screen pages and at the same time request the user participant to perform the task. This type of testing is informal testing which is inexpensive, quick and mostly productive.

- (ii) Discount usability testing:

It is an quick and dirty approach to perform task analysis, prototype development and testing. It is widely used as it is adapted by naive users. A constraint connected with this testing is that it allows only six test participants, which create problems such as allowing prompt revision, iterative testing. This problem can be addressed by using discount usability testing as formative evaluation and extensive usability testing as summative evaluation.

- (iii) competitive usability testing:

The competitive testing is used to relate new

interfaces to the older versions of interfaces or else to those products which are analogous to the products developed by the competitors. The designs appear to be powerful in the subjects as the participants are entitled to perform comparison between competing interfaces.

(iv) Universal usability testing:

This technique performs tests upon different types of users, hardware, software platforms and networks. This demands high testing to resolve the problems to elicit the success. Few factors such as trying large and small display, slow and fast networks, different operating systems or internet resources can contribute to the customer success.

(v) Field tests and portable labs:

This testing illustrates the practical implementation of the new interfaces in realistic environments for a certain period of time. Such tests can be more advantageous provided when logging software identifies errors, command and substantiates frequencies and productivity measures. It provides users with test versions operating new software or consumer products.

(vi) Remote usability testing:

This type of testing is concerned with performing usability test online. This avoids complexity and the expense included in hiring the participants. This allows to have large number of participants with different backgrounds, participants can perform tests in their own

environment using their own equipment. This test can be performed synchronously and asynchronously.

(vii) Can-you-break this test:

This type of test is developed by game designers. It is a destructive testing approach where in the users search for errors and flaws in the system else destroy the system.

It has a drawback where as the defective products are rejected by software purchases and the cost of replacement is high.

2. Discuss how social impact statement helpful for early design review.

Interactive systems often have a dramatic impact on large number of users.

Governments, utilities and publicly regulated industries increasingly require information systems to provide services. A social impact statement, similar to an environmental-impact statement might help to promote high-quality systems in government related applications. An outline for a social impact statement might include these sections

Describe the new system and its benefits:

- convey the high-level goals of the new system.
- identify the stakeholders.
- Identify specific benefits.

Address concerns and potential barriers:

- Anticipate changes in job functions and potential layoffs.
- Address security and privacy issues.
- Discuss accountability and responsibility for system misuse and failure.
- Avoid potential biases.
- Weigh individual rights versus societal benefits.
- Assess tradeoffs between centralization and decentralization.
- Preserve democratic principles.
- Ensure diverse access
- Promote simplicity and preserve what works.

Outline the development process

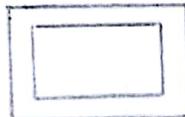
- Present an estimated project schedule.
- Propose process for making decisions.
- Discuss expectations of how stakeholders will be involved.
- Recognize needs for more staff, training and hardware.
- Propose plan for backups of data and equipment.
- Outline plan for migrating to the new system.
- Describe plan for measuring the success of the new system.

After the social impact statement is written, it is evaluated by the appropriate review panel plus managers, other designers, end users and anyone else who will be affected by proposed system.

3. Discuss different ways of organizing single menus.

Single menus:

Single menus may have two (or) more items, or may allow multiple selections. Single menus may pop up on the current work area or may be permanently available.



Linear menu sequences:

Series of independent menus that guide users through a series of choices; effective for novice users

Ex: Wizard, Shopping cart

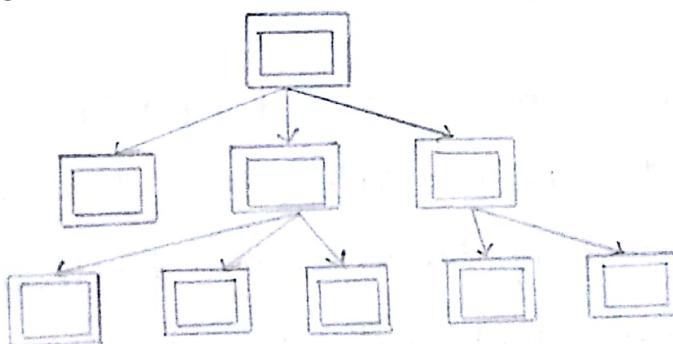


Simultaneous menus:

Present multiple active menus at the same time, allow users to enter choices in any order, effective for experienced users, require more display space.

Tree-structured menus:

Categorize similar items and create tree structure, mutual exclusive groups with distinct identifiers; can be extremely large without cluttering the display.



Acyclic and cyclic menus (Network structures)

Provide access from a menu item from different menu branches, can be faster, potential of getting lost higher

Example:

WWW is the best example.

4 Discuss how movement through menus can be done in fast.

A standard way to permit frequent menu users to speed through the options is to provide keyboard shortcuts. For example, in Microsoft Word the shortcut ctrl-s will save and ctrl-z undo. Even if the display of the menu items is very fast, such a user will still tend to use the speedy keyboard shortcuts rather than reaching for the mouse, opening the View menu, and selecting the appropriate option.

This approach is attractive because it is rapid and allows graceful evolution from novice to expert. Shortcuts should be indicated next to the menu item labels so that users can progressively learn new shortcuts as needed.

Allowing users to mouse ahead by relying on their muscle memory to reproduce the series of angular displacements necessary for a command selection.

In web browsers, bookmarks provide a way for

users to take shortcuts to destinations that they have been visited previously. For many users, this menu of destinations can grow quickly and require hierarchical management strategies, becoming a challenge in itself.

Finally, when items of a lower-level menu need to be used multiple times in a row, tear-off menus can be useful to keep the list of options visible on the screen.

5. Discuss briefly about speech and auditory interfaces

Speech and auditory interfaces:

Many researches desire to establish voice-based conversation between user and computer which leads to the development of speech and auditory interfaces. Its practical application helps in many situations where the users hands are busy, users having disabilities etc.

The following are the technologies used for voice-based human-computer interaction.

- (i) Discrete-word recognition
- (ii) continuous speech recognition
- (iii) speech store and forward
- (iv) speech generation
- (v) Discrete word recognition:

When a particular person speaks certain individual words those words can be recognized by a device known as discrete word recognition with a reliability rate of about 90-98% and vocabularies from 20-200 words.

- There are two types of environment tasks
- System with speaker-dependent training task
 - System with speaker-independent task
- The various uses of this device are
- * It enables a user to carry on with his work when users hands are busy on primary input device i.e., keyboard.
 - * It enables a user to complete work without having necessity to take off hand from keyboard or eyes off from the monitor.
 - * Flexibility is required
 - * Telephone companies
 - * Military aircraft
 - * Training laboratories
 - * Offices
- Disadvantages:
- * The purpose of interaction^{medium} between the user and system is not served properly
 - * Does not serve the purpose of rapid manipulation while editing

(ii) continuous speech recognition:

Speech is one of the direct communication medium. It is very useful for the users who cannot use their keyboard or mouse to interact with the system. In this system, words are continuous and connected together without any process.

It can be used to dictate letters, compose reports verbally and allow computer to scan long audio sound tracks etc. The main difficulty with continuous speech is it is difficult to handle i.e., the more faster user speaks it is more difficult.

These are manufactured by companies like verbox and speech systems.

(iii) speech store and forward:

~~Speech store and forward~~ method facilitates a user to accomplish the following tasks,

- Receive messages
- Store messages
- Delete messages
- Forward messages
- Reply to caller's message
- Replay messages.

System that permits the store and forward spoken messages are reliable and useful.

Following are the technologies that evolved one after the other thereby overcoming the drawbacks

to serve the purpose of storing and forwarding spoken messages.

- Voice-mail technology
- Telephone based information system
- Personal tape recorders
- Credit card sized devices
- Audio tours

(iv) Speech generation:

Many researchers often desire to establish conversation between user and a computer.

Speech generation is also called as "synthesis technology".
Speech is a "bicycle of user-interface design" which is easy and fun to use, but can carry only light load. These devices are mainly used in automobiles, children's games, soft-drink vending machines etc.

The phrase and accent structure of speech that provides information about the meaning of sentence is one of the most critical aspects of synthesis technology to improve and this is the main carrier for "speaking style".

- Speech generation is "frequently preferable" when
- * The message is simple and short
 - * A message is referred only once
 - * The messages are based on timely events.

A quick response is an essential requirement of message.

* Visual channels of communication are overloaded i.e., in case of poor visibility.

Speech generation is successful and feasible.

Differentiate direct control and indirect control Pointing devices.

Direct-control pointing devices:

The devices which has a direct control on the screen are

→ light pen

→ Touch screen

→ stylus

(i) light pen:

A light pen is an input device that permits the user to point objects on screen accurately.

Strengths:

* Light pen is very simple to implement.

* The use of light pen provides more accuracy than finger touching.

Weaknesses:

* The hand movement required by light pens may blur the screen partially.

* Light pens get weaken when they are used for a long period of time.

(ii) Touch screen:

A touch screen consists of a special surface screen on which the objects are pointed and selected.

Strengths:

- * Touch screen movement is direct with respect to the plane on screen.
- * No additional desk space is required.

Weaknesses:

- * For small objects, finger pointing is very large for achieving accuracy.
- * Touch screens may corrupt or destruct the screen.

(iii) Stylus:

The stylus is an input device used to input the commands to the computer.

Strengths:

- * It offers multiple tip designs.
- * It protects the screens from scratches.

Weaknesses:

- * It can be easily damaged
- * It has low efficiency
- * It can damage the surface if access forcibly.

Indirect control pointing devices:

A user can input the data to a computer using an input interface which is known as a pointing device.

Indirect-control point devices are

(i) Mouse:

A mouse is a rectangular or dome-shaped control device that allows the user to perform various system-dependent tasks. It consists of three buttons which are used to manipulate the data and objects on screen.

(iii) Trackball:

Trackball is an input device which consists of a ball that moves in all directions within its socket. For example, in video games or in 3D-environments.

(iii) Joystick:

It is a bat-shaped device which usually comes in small and large sizes.

There are two types of joysticks

→ Force joysticks:

They can't be moved smoothly but respond through force that is applied against them.

→ Movable joysticks:

They can be moved smoothly within a disk-shaped region.

(iv) Graphics tablet:

It is a device that consists of a horizontal surface known as a touch tablet. It is very sensible to heat, light and stress related factors. The pointers movement on screen follows the movement of graphic tablet.

(v) Touchpad:

A touchpad is a touchable surface of 5x8 cms

that provides accessibility and accuracy of a touch screen.

Therefore, a mouse is proved to be best among all the pointing devices because of its comfortable hand position and fast and accurate point.

