INTERFACE DESIGN

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APPROX. TIME LINE

WHY WE NEED IT

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ENGINEERING DESIGN CENTRE

DESIGNERS’ POINTS

- Keep similar interface elements together.
- Use distinctive symbols for keeping in mind consistency.
- Remember how a colour will be perceived, considering colour icon exists.
- Remember top-down theory, means users' expectation from an interface.

EAR

AUDIOTRAGRAM
HEARING IMPAIRED USERS

- Checklist to listen soft sound
- Loud sound may seem louder [Gonzalez Recalde]
- Reduced response to spectral contrast [like ringing of an alarm]

DESIGNERS’ POINTS

- Increasing volume cannot solve the problem
- Background noise and music may reduce ability
- Certain words or syllables may have higher chances to be confused, which should be taken care of during designing audio-based dialog systems

BRAIN

MEMORY
MEMORY RETRIEVAL

A node with more connections will be retrieved quicker and with higher probability of retrieval.

DESIGNERS’ POINTS

- MORE CONNECTIONS — EASY RETRIEVAL
  - TRY TO MAKE INTERFACE ELEMENTS FAMILIAR TO USERS
  - USE ANALOGY TO USERS’ KNOWN OBJECTS, ACTIONS
- IDENTIFY AND CATEGORIZE PROSPECTIVE ERRORS BY ENV
- THINK ABOUT SHORT TERM / WORKING MEMORY LOAD WHILE DESIGNING AN INTERFACE
  - RESTRICT AMOUNT OF ITEMS IN A SINGLE SCREEN

RAPID AIMING MOVEMENTS

Quick
Accurate
Preprogrammed
TWO PHASES OF MOVEMENT

- Initial Impulse
- Current Control

FITTS' LAW

\[ T = a \log_2 \left( \frac{D}{W} \right) + b \]

Figure 1: Designated pointing apparatus. The task was to hit the center point in each group alternately without touching either side interval.

COMPUTER INPUT DEVICE

DESIGNERS’ POINTS

- Takes longer time to point if
  - Target is away from source
  - Target is small
- Movement occurs in multiple movements
- See movements in pointing phase may be random due to physical or situational interference
  - Reduce hesitation times to avoid missing selection
NIELSEN’S USABILITY HEURISTICs

- Visibility of system status
- Matching between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help and documentation

GUIDELINES

COGNITIVE WALKTHROUGH

- Experts simulate users’ interaction
- Walks through high frequency to low frequency tasks
- Good for exploratory interfaces
- Can quickly identify errors, wrong assumptions, in structure. Frequency of interface

THINK ALOUD PROTOCOL

- Users undertake task while “thinking aloud”
- Provides rapid, high-quality, qualitative user feedback
- Allows meaningful, directed dialogue
- Enables understanding users’ way of thinking and can capture
- Can be video recorded for later analysis
SURVEYS

• IBM User Satisfaction Questionnaire
  - Design
  - Information quality
  - Interface quality

• Spiderman’s Questionnaire for User Interaction Satisfaction
  - System functionality
  - User guidance
  - Screen design
  - Gapping
  - On-line testing and use

CONTROLLED EXPERIMENTS

• Psychological experiment in controlled laboratory setting
• Results suitable for formal statistical analysis
• Used to measure effect of an interface on interaction of users’ performance
• Not suitable for exploratory analysis or at design phase, should be used as a confirmatory test

OTHER TECHNIQUES

• Fuzzy logic reasoning
  - Uses generalization among levels, contexts, and human factors to test through a dynamic, flexible fuzzy reasoning element

• Fuzzy inspection
  - Uses guidelines for fuzzy reasoning used to access human levels, choices for level
  - Uses decision tree for testing level, uses time to make choices from level
  - Tests that a slight change in knowledge can change in order to assess a provided feature

• Consistency inspection
  - Determines which interface’s accuracy is correct to help assess an interface to use whether it goes through the same way as their own devices

• Security inspection
  - Uses data for an interface standard and inspect the interface for compliance

• Formal inspection
  - Determines which interface style meets with displayers

USABILITY METRICS

SHORT-TERM BASED ON REPRESENTATIVE TASK / APPLICATION

• Task completion time
• Number ofErrors / Correct actions
• Cognitive load
• TMSA T.S Score