Human Computer Interaction

UNIT:3
Lecture : 6
Guidelines in HCI

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Lecture 6:

Cognitive Walkthrough

Introduction

Cognitive walkthrough is a usability method that focuses on evaluating a design (existing or proposed) for ease of learning particularly through explorations by the User..

Cognitive Walkthroughs   [CWT]are :

- Usability Inspection Methods [UIM]

- Focus on Evaluating a Design's navigation .

- Basis is 'Ease of Learning' by self exploration by the user

Background

Cognitive Walkthrough has the same basic structure and rationale found in software walkthroughs (Yourdon 1989).

In the software **code** walkthrough, the sequence represents a segment of the program code that is ' walked through' by the reviewers to check certain characteristics (e.g., that coding style is adhered to, conventions for spelling variables versus procedure calls, and to check that system wide invariants are not violated).

•In cognitive walkthrough [CWT], the sequence of actions refers to the steps that a user will require to perform on the interface so as to accomplish a task.

•The evaluators then 'walk through' that action sequence to check it for potential usability problems.

•Focus of the cognitive walkthrough is to establish how easy a system is to learn by operating it. The focus is on learning through exploration.

Ref: Yourdon .E Structured Walkthroughs (4th edition) Englewood cliffs .NJ Yourdon Press.

CWT Questions:

1. Will the user try to achieve the right effect ?

2. Will the user notice that the correct action is available ?

3. Will the user associate the correct action with the effect that the user is trying to achieve ?

4. If the correct action is performed will the user see that progress is being made towards solution of the task ?

Significance

Walkthroughs help answer interfaces design questions like:

- How will the user approach a task ?

- What is the correct action sequence for each task and how it needs to be described to the user.

- How to achieve the desired action sequence form the user with minimum human cost and maximum efficiency

- How quickly will the user learn & becomes comfortable with the interface?

Example of where CWT is useful

When ATMs were first introduced one of the questions on the design of operational sequence was –

➢ Should balance in account be displayed simultaneously every time the user access the ATM ? Or
➢ Is it better to display balance after the transaction is over.

➢ A walk through reveled both the above assumptions are out of sequence as far as the user is concerned.

➢ Seeking 'Balance' is a sub goal either before starting of a transaction or after a transaction is over. In either case it needs to be an independent Goal by it self rather than a sub goal of accessing the account. Users approach ATM more often for Withdrawal than for knowing Balance.

Example 2

Task: Print Document. Should a printer be selected first and then Press PRINT or Press PRINT first and then chose the Printer ?

The Task is to print a document. Will the user know implicitly how to do so (take a print out). They must first select a printer on the screen given the context of the application .

To assume that it is such a simple action   and "*every one should know*" is against the principle of HCI design.

If an interface or software engineer makes any assumptions in answering this simple   question, result could be an ineffective.
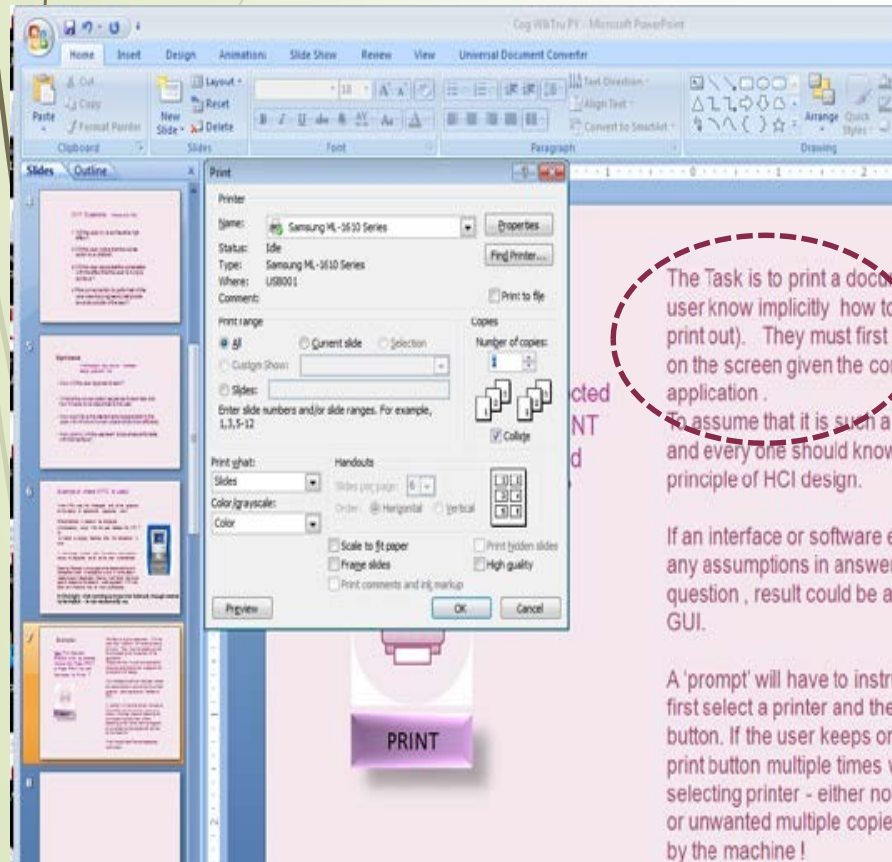
PRINT

GUI.

A 'prompt' will have to instruct the user to first select a printer and then press print **button**. If the user keeps on pressing the print button multiple times without selecting the printer - either nothing happens or unwanted multiple copies are spit out by the machine !

Walk through identifies such gaps and prevent errors.

Cognitive Walk Through has two phases:

Preparation phase

i) Building A prototype { paper; mock up; screen based } with description. It need not be perfect or complete in all request.

ii) Making a list of selected tasks you want the user to 'walk through' the interface along with you. The task should have ready well defined sequences for Goals and sub goals with written actions used to complete each individual task.

iii) A clear understanding of the user , his /her background; level of expertise in the domain; prior experience of using similar software etc.

Evaluation phase

i)   Conducting the Walkthrough session

ii) Recording the Observations

i)   Analysis

i)   Inferences

i)   Recommendation to Interface Team

The evaluator should prepare to look for answers to Questions in table:

The purpose of conducting the walk through must be clear to the evaluator prior to starting the walk through.

Question	
Can the users understand & reach the goal –the purpose of the assigned task ?	This will yield what the user is thinking once a task is assigned. Most of the time users do not think or act the way as the interface designer expects or wants them to.
Will users be able to locate the buttons / GUI elements for the action they are supposed to perform given the task ?	Often it is very difficult for the user to find the control / element to start . This is even more confusing to the user when there are several or multiple possibilities to start the sequence - on the GUI.
Does the interface provide understandable feed back at every action in the task sequence ?	Often even if the users are able to locate the right GUI control /element can they tell with high degree of confidence that this is the right control for the action they want to perform and that they will indeed reach the goal. Intermittent feed back assures users that they are indeed proceeding in the right direction. Feed back can be in the form of sound or labels or motion or change in status.

Over view of the actual Walkthrough Processes

Pre-preparation:

1. Define Users :   Who are the users. Identify them.
(Catagorise them as Novices, Intermittent & Experts)

2. Identify the tasks for the evaluation

Ex: Evaluation for "Checking out Balance on an ATM"
Prepare notes on what the user must know prior to performing the task
and what the user should be learning while performing the task.

3. Prepare action sequences for completing the Tasks

Make a " AND THEN " list of Goals & sub glass.

Ex: Overall Goal: Find out balance from the ATM

Sub goal1 : Activate ATM [Physical action Insert Card]

Sub goal2: Identify self [Input pin code]

Sub goal 3 : Get balance [press action button with label]

Sub goal 4: Get a print out [if required]

Sub gaol 5: Log out from ATM .

4. Conduct the Walk Through Session

Conducting the Walk Through Session

- Using the mock up prototype ask the user to perform a task.

- Make the user walk through the action sequences for each task.

- Make a recording of observations in a Recording Sheet .

Paper mock up cut outs of screens are kept ready. User is asked to operate the remote control for a given task.

Depending on what the user presses, the corresponding paper display is slipped on the cardboard / mock up of the remote controller.
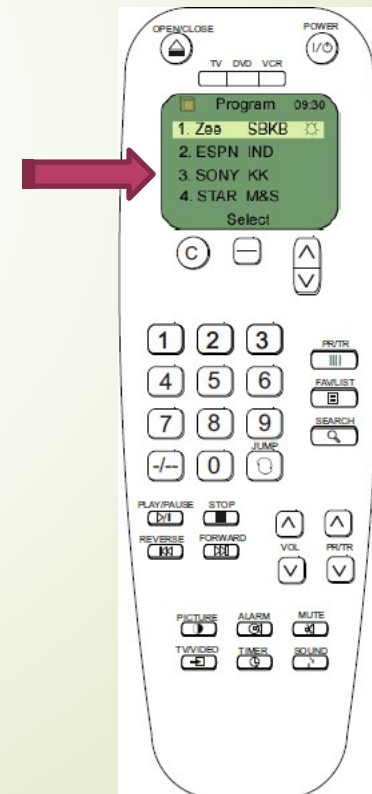
Make the user walk through the action sequences for each task

Example of an Action sequence for forwarding Calls on a telephone.

Task: Forward phone calls to my office assistant / friends desk while I am out for a short period and reset it back to original state.

A1. Activate call interface.
R1. Sound feed back of activation done by tone 1
A2. Press #2   (Command to cancel call forwarding)
R2. Sound of registering press command by tone 1.
A3 . Listen to sound feed back confirming completion of action.
     Time lapse Second Tone 2

Reverse cycle

A4.   Activate call interface
R1.   Sound feed back of activation done by tone 1
A6.   Press *2 (Command to cancel forwarding)
R2.   Sound of registering press command by tone 1.
A7.   Listen to sound feedback confirming completion of action. Tone 2
        End of sequence
End of Task.

Observation during the Walk Trough

- The above task is assigned to a user. The user is asked to proceed executing the task on a mock up / paper prototype / wire frame prototype.

- The user is asked to achieve a goal (of forwarding a call in his absence and informed about the sequence of actions.

- The sequence of inputs as carried out by the user are observed.

- The errors committed (deviation from the expected sequence and corresponding action) are noted.

- The difficulties are mutually discussed with the user. Why a user acted in particular way and did not act in ways that was expected is explored.

Make a recording of observations in a Recording Sheet .

Description of step.	Did the user try to achieve the end goal or did he give up At the start itself.	Did the user notice that the correct action choices are available. Yes – PARTLY- No	Did the user confidently know that the choice being made by him/her is the right one ? Yes / No	Did the user understand the feedback after every action	Did the user Complete the Task With satisfaction Yes PARTLY No	Comments / Alternative suggestions/ solutions / discussion points.
A1. Activate call interface.	YES	PARTLY	YES	YES	YES	
A2. Press #2 (Command to cancel call forwarding)	YES	YES	YES	NO	PARTLY	Was not paying attention to sound feed back as it was not expected.

Analysis & Inference

Action in Sequence	System mismatch question	Potential Problem & Design solution	% Mismatch to ideal situation (qualitative estimation)
 A1. Activate call interface.	Is it clear to the user that system has taken input	Low clarity of sound. Ambient Noise. Increase volume	30%
	Can the user resume control for the next action	YES	
	Are the systems response visible & interpretable	No	
	Is the end of the system action clear	YES	
A2. Press #2 (Command to cancel call forwarding)	Is it clear to the user that system has taken input	PARTLY	50%
	Can the user resume control for the next action	NO	
	Are the systems response visible & interpretable	PARTLY	
	Is the end of the system action clear	NO	

Summarize the findings:

Percentage of mismatch 50%
The Interface needs improvement .
Sound Tone to be changed
Sound Volume to be increased
Additional Feed back to be incorporated in A2

End of Walk Through Testing Report

References:

C. Wharton, J Rieman , P. Polson & C Lewis ; The Cognitive Walkthrough Method : A Practitioner's Guide. In J. Nielsen & R.L.Mack (Editors) , Usability Inspection Methods, John Wiley & Sons, New York.

Yourdon .E Structured Walkthroughs (4th edition) Englewood cliffs .NJ Yourdon Press.