

## **UNIT 3: SYSTEM ORIENTED PERSPECTIVE OF HUMAN COMPUTER**

### **INTERACTION IMPROVING UPON THE USER'S TECHNOLOGICAL PERSPECTIVE**

#### **Table of contents**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Technical Support offered the System Users
  - 3.2 User modelling
  - 3.3 Designing user support
    - 3.3.1 Presentation issues in designing user support:
    - 3.3.2 Implementation issues in designing user support
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 Further Reading/References

#### **1.0 Introduction**

The input and output technological perspective of the system from the user's view is enhanced by the kind of support given the users of the system.

There are different types of support available to the users at different times particularly important during the implementation and presentation stages. Hence the computer interaction components require careful design.

Types of user support that can be designed and offered include quick references, task specific help, full explanation, and tutorials.

The kind of help solutions are provided on specific problem oriented operations while documentation solutions are given on system oriented and general operations. The same design principles apply to both.

#### **2.0 Objectives**

By the end of this unit, the student should be able to :

- Understand help supports available to the users
- Describe user modelling and knowledge representation
- Know how to design user supports

#### **.0 Main Content**

##### **.1 Technical Support offered the System Users**

The following are the requirements of an effective design of technical support that can be offered to the system users

Continuous access concurrent to main application should be made available Help Support

For accuracy and completeness, the help should match and cover actual system behaviour  
There must be consistency between different parts of the help system and paper documentation  
Robustness should exist for correct error handling and unpredictable behaviour  
There should be flexibility such that the system allows the user to interact in a way appropriate to experience and task  
Encountering problems while operating the system should not prevent the user continuing with the work

The approaches to user support include the following:

Command assistance should enable the user to request help on a particular command e.g., UNIX and DOS help can be good for quick reference.

If we assume that the user has knowledge of the command and what to look for, then the command prompts should provide information about correct usage when an error occurs and be good for simple syntactic errors

Context sensitive help:

Ensure that the help request is interpreted according to context in which it occurs. e.g. tool tips  
The on-line tutorials allow the user to work through the basics of application in a test environment. Though often inflexible, it can be useful.

The on-line documentation though available in paper documentation is also made available on the computer. It should be continually available in common medium as well.

Since on-line documentation can be difficult to browse, then hypertext should be included to support browsing..

Adaptive Help Systems

These use knowledge of the context, the individual user, the task, the domain and the instruction to provide help adapted to the user's needs.

The problems with adaptive help systems are that they require considerable knowledge, the interaction is not controlled and it is difficult knowing what should be adapted and the scope of the adaptation.

Issues concerned in adaptive help:

Initiative ; the question is whether the user retain control or can the system direct the interaction of the user, and can the system interrupt the user to offer help?

Effect ; the question is what is going to be adapted and what information is needed to do this?  
Only what is needed is modelled.

Scope ; Is the scope of the modelling at application or system level? It is more complex at system level e.g. expertise varies between applications.

Wizards and assistants:

Wizards

Wizard is a task specific tool that leads the user through a task, step by step, using the user's answers to specific questions

Example is in the preparation of resum .

Wizard is useful for the safe completion of complex or infrequent tasks.

It has a limited flexibility in a constrained task execution so it must allow the user to go back to the beginning of the task.

Assistants

Assistants monitor the user behaviour and offer contextual advice though it can be irritating e.g. as in MS paperclip.

They must be under the user control e.g. XP smart tags

### **3.2 User modelling**

In the user modelling of the knowledge representation, all help systems have a model of the user. It may be a single or generic user (non-intelligent user). The models could be an adaptable user-configured or adaptive system-configured.

Approaches to user modelling

Quantification: Here the user moves between levels of expertise based on quantitative measure of what he knows.

Stereotypes: The user is classified into a particular category.

Overlay: The idealized model of an expert use is constructed and actual use compared to ideal.

The model may contain the commonality or difference

In a special case, the user behaviour is compared to a known error catalogue.

Knowledge representation

Knowledge representation occurs when knowledge is presented as rules, and facts are interpreted using inference mechanism.

The domain and task modelling of the knowledge representation covers common errors and tasks particularly the current task.

It usually involves the analysis of command sequences.

However the problems here are concerned on how to represent the tasks particularly when interleaved, and how to know the user's intention.

Knowledge representation: Advisory strategy

The advisory strategy for knowledge representation involves choosing the correct style of advice for a given situation in form of a reminder, tutorial, etc.

Few intelligent help systems model advisory strategy, but choice of strategy is still important.

Techniques for knowledge representation

The techniques for knowledge representation are rule based (e.g. logic, production rules) when knowledge are presented as rules and facts are interpreted using inference mechanism. They can also be used in relatively large domains..

It is frame based (such as a semantic network) when knowledge stored in structures with slots are to be filled but useful for a small domain..

Network based

The knowledge is network based when represented as relationships between facts and can be used to link frames.

It is example based when the knowledge is represented implicitly within decision structure and trained to classify rather than programmed with rules. This one requires little knowledge acquisition

Problems with knowledge representation and modelling

The problems here include knowledge acquisition, the resources and the interpretation of user behaviour

### **3.3 Designing user support**

User support is not an 'add on' but should be designed integrally with the system. The designer should concentrate on content and context of help rather than on technological issues.

#### **3.3.1 Presentation issues in designing user support:**

How is help requested? Is it at the command level, by button, by on/off function, or by separate application?

How is help displayed? Is it through a new window, or a whole screen, a split screen, pop-up boxes, or hint icons?

The designer should note that effective presentation requires clear, familiar, and consistent language. It should contain instructional rather than descriptive languages. Blocks of text should be avoided.

#### **3.3.2 Implementation issues in designing user support**

Implementation issues are whether the help is in form of an operating system command, a Meta command or an application.

There should be a clear indication of summary and example information.

What are the resources available in terms of screen space, the memory capacity and the speed of processing?

Is the structure of help data in form of a single file, a file hierarchy or a database?

Other issues concern the flexibility and extensibility of implementation and whether it is made in hard copy or by browsing.

### **4.0 Conclusion**

Computer interaction components require careful design. The design should ensure that there are different types of support available to the users at different times particularly during the implementation and presentation stages.

Help solutions should be provided on specific problem oriented operations, while documentation solutions are given on system oriented and general operations.

### **5.0 Summary**

Effective design of technical support reflects in continuous access concurrent to main application being made available

Accuracy and completeness are guaranteed when the help support matches and covers actual system behaviour

Wizard is a task specific tool that leads the user through a task, step by step, using the user's answers to specific questions while assistants monitor the user behaviour and offer contextual advice.

User modelling occurs when all help systems have a model of the user. Knowledge representation is the presentation of knowledge as rules and facts, and interpreted using inference mechanism.

User support should be designed integrally with the system. The designer should concentrate on content and context of help rather than on technological issues.

## **6.0 Tutor Marked Assignment**

1. Mention three kinds of Help Support that can be designed for the Computer System Users. What are their demerits?
2. What is Knowledge representation? Describe the rule based, the frame based and the networked based techniques of Knowledge representation.
3. Designing the user support requires considering some presentation and implementation issues. Describe two of presentation issues and three of implementation issues that should guide the designer

## **7.0 Further Readings / References**

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