MODULE 2: USER PERSPECTIVES OF HUMAN-COMPUTER INTERACTION

UNIT 1: USER ORIENTED PERSPECTIVE OF HUMAN COMPUTER INTERACTION: SOCIAL HUMAN THRUST

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1.0 Introduction

This unit concerns socio-organizational issues and stakeholder requirements
Organizational issues affect acceptance of new computer systems because where there are conflicts and power, the question arises on who benefits and who encourages the use.
Stakeholders of a new computer system identify their requirements in organizational context. Organizational context may play different roles in internal and external situations. For an organizational information system to be used by the organization's own employees, organizational context analysis answers questions such
as: What is the larger system where this information system is embedded? What are the interactions with other entities in the organization? What are the organizational policies or practice that may affect individual's attitude and behavior towards using the system?
This event is the sociological, organizational, and cultural impact of computing. In other words, the organizational, social and cultural context in which humans interact with IT. This context is largely the result of the broad adoption of IT by organizations and society to support organizational functions and goals and to enhance society's development.

2.0 Objectives

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

i. The socio-technical models that look at human and technical requirements
ii. The soft systems methodology that considers the broader view of human and organizational issues
iii. The participatory design that includes the user directly in the design process
iv. The ethnographic methods that study users in context with unbiased perspective

3.0 MAIN CONTENT

3.1 Organisational issues.

Organisational factors can make or break a system. Studying the work group is not sufficient since any system is used within a wider context and the crucial people need not be the direct users.

Therefore, before installing a new system, one must understand:

- Who benefits?
- Who puts in effort?
- The balance of power in the organisation and how the system will be affected.

Even when a system is successful, it may be difficult to measure that success Conflict and power In computer supported *cooperative* work (CSCW), people and groups have conflicting goals hence the systems design assumes cooperation will fail! For example, in a computerised stock control, the store man looses control of information and may decide to subvert the system before or after it becomes operational. Therefore, it is important to identify stakeholders — not just the users.

Organisational structures

Groupware affects organisational structures so also communication structures reflect line management. For example, email is a cross-organisational communication.

Organisation structure can also disenfranchise lower management and disaffected staff could 'sabotage'. Because technology *can* be used to change management style and power structures, the implementation of such technology would improve upon organizational efficiency.

For example, organizational efficiency may be expected due to redesign of workflows among critical business units that is affected by the implemented IT; satisfaction and retention of customers/clients are anticipated due to accurate and fast information gathering and presentations, to name a few. It is noteworthy that some of the organizational or societal impacts may not be tangible or directly attributed to HCI considerations. This assertion is in line with the issues of determining IT values in organizations and societies.

3.2 Invisible workers

Telecommunications improvements allow neighbourhood work centres and home-based tele-working. Many ecological and economic benefits arise from tele-working such as reduced travel and flexible family commitments.

But 'management by presence' is absent. The presence in the office increases perceived worth and reduces problems for promotion.
Barriers to tele-working are both managerial and social but *not* technological.
The new system should benefit all. Disproportionate effort should be avoided. Examine who puts in the effort and who gets the benefit.
It is possible to get benefit without doing work, if everyone does it, system falls into disuse
To get started, look for cliques to form core user base and design to benefit an initial small user base

Evaluating the benefits
Assuming we have avoided the pitfalls! How do we measure our success?
Job satisfaction and information flow and economic benefit should diffuse throughout the organisation There is the need to identify requirements within context of use and the need to take account of stakeholders. Work groups and practices should be identified in organisational context
Many approaches including socio-technical modelling, soft system modelling, participatory design and contextual inquiry are used.

Who are the stakeholders?
The system will have many stakeholders with potentially conflicting interests. Stakeholder is anyone affected by success or failure of system. The primary stakeholders actually use the system, the secondary receive output or provide input, while the tertiary have no direct involvement but are those affected by the success or failure of the new system.

Facilitators are those involved in the development or deployment of the system.

Example: Classifying stakeholders — an airline booking system
An international airline is considering introducing a new booking system for use by associated travel agents to sell flights directly to the public.
Primary stakeholders: The travel agency staff and the airline booking staff Secondary stakeholders: Customers and the airline management
Tertiary stakeholders: Competitors, civil aviation authorities, customers' travelling companions and, airline shareholders
Facilitating stakeholders: The design team and the Information Technology department staff
Designers need to meet as many stakeholder needs as possible. Usually needs may be in conflict so they have to prioritise, often priority decreases as one moves down the categories

3. 3 Socio-technical modelling

This is a response to *technological determinism* and it is concerned with the technical, social, organizational and human aspects of design. It also describes the impact of specific technology on organization. It is concerned with information gathering such as interviews, observation, discussion with focus groups and document analysis.
Several approaches to be considered are the Stakeholders' Focus and the ESTA (Eight Stage Task Analysis).

3. 3.1 Stakeholders' Focus

This comprises six stage processes that focus on stakeholders
The first describes the organizational context, including primary goals, physical characteristics, political and economic background
The second identifies and describes the stakeholders including personal issues, role in the organization and their job.
The third identifies and describes the work-groups whether formally constituted or not
The fourth identifies and describe task—object pairs; these are tasks to be performed and objects used The fifth identifies the stakeholder needs: Stages 2—4 described above are in terms of both current and proposed system, the stakeholder needs are identified from the differences between the two.
Lastly, we consolidate and check the stakeholder requirements against earlier criteria.

3. 3.2 ESTA (Eight Stage Task Analysis)

This is an eight stage model that focuses on task
The primary task is identified in terms of users' goals Secondly, task inputs to the system are identified
Thirdly, the external environment into which the system will be introduced is described, including physical, economic and political aspects
Fourthly, the transformation processes within the system are described in terms of actions performed on or with objects
In the fifth stage, the social system is analyzed by considering existing internal and external work-groups and relationships
At the sixth stage, the technical system is described in terms of configuration and integration with other systems
At the seventh stage, the performance satisfaction criteria are established, indicating social and technical requirements of the system.
The last stage specifies the new technical system.

3.4 Soft systems methodology

The soft systems methodology considers the broader view of human and organizational issues
There is no assumption of technological solution here — emphasis is on understanding the situation fully This methodology was developed by Checkland.
The seven stages involved here are:

i. Recognition of problem and initiation of analysis
ii. Detailed description of problem situation; it is a rich picture stage
iii. Generation of the root definitions of system: this is known as CATWOE (see definition below)
iv. Conceptual model - this identifies transformations
v. This compares real world to conceptual model
vi. Identifies necessary changes
vii. Determines actions to effect changes

CATWOE (Clients, Actors, Transformation, World View, Owner, Environment) further defines and explains the soft systems methodology.
Clients: those who receive output or benefit from the system Actors: those who perform activities within the system Transformations: the changes that are affected bythe system
World View - how the system is perceived in a particular root definition
Owner: those to whom the system belongs, to whom it is answerable and who can authorize changes to it Environment: the world in which the system operates and by which it is influenced

3.5 Participatory design

In participatory design, workers enter into design context while in ethnography (as used for design), the designer enters into work context. Both make workers feel valued in design and encourages workers to 'own' the products. The user is an active member of the design team.

Characteristics
Participatory design is context and work oriented rather than system oriented. It is collaborative and iterative
Methods involved are: brain-storming, storyboarding, workshops, pencil and paper exercises.

Ethics
The ethics involved the participatory socio-technical approach devised by Mumford.
It states that the system development is about managing change and that non-participants are more likely to be dissatisfied.
There are three levels of participation: consultative, representative, and consensus.
Design groups including stakeholder representatives make design decisions and job satisfaction is the key to solution
(See the unit on Participatory Design for more details)

3.6 Ethnography

This is very influential in CSCW
It is a form of anthropological study with special focus on social relationships and does *not* enter actively into situation.
It seeks to understand social culture, it is unbiased and open ended.

3.7 Contextual inquiry

Here inquiry is conducted in ethnographic tradition but acknowledges and challenges investigator focus. It creates a model of investigator being apprenticed to the user in order to learn about the work.

The investigation takes place in the workplace with detailed interviews, observation, and analysis of communications, physical workplace, and artefacts.
Number of models created is according to sequence, physical, flow, cultural, and artefact
The models are consolidated across users, while the output indicates task sequences, the artefacts and communication channels needed, the physical and cultural constraints

4.0 Conclusion

Work groups and practices should be identified in organisational context
Many approaches including socio-technical modelling, soft system modelling, participatory design and contextual inquiry have been explained.
In concluding, there is the need to identify requirements within context of use and the need to take account of stakeholders.

5.0 Summary

The socio human thrust analysis explains the socio-technical models of human and technical requirements, the systems methodology that considers human and organizational issues, the participatory design that includes the user directly in the design process and the ethnographic methods that study users in context with unbiased perspective.

6.0 Tutor Marked Assignment

1. "Organizational factors can make or break a system". Explain the concepts of this expression as it affects users in an organization when designing a new interactive computer system.
2. What do you understand by a Computer Supported cooperative Work (CSCW) in an organization. Why is it important to identify and consider stakeholders when designing interactive systems in an organization?
3. What are the factors used in evaluating whether a designed and implemented system is successful in an organization?
4. Who is a stakeholder in a human computer interaction? Differentiate between a primary stakeholder, a secondary stakeholder and a facilitator of a newly designed interactive system.
5. Differentiate between the different goals of the six stage model of Stakeholders' focus and the eight stage model of ESTA within the human aspects of interactive design.
6. What is the full meaning of the acronym "CATWOE"?
7. Explain what you understand by Participatory Design of Human Computer Interaction. What are its characteristics and the Ethics involved?

7.0 Further Readings / References

- Reddy, R., "To Dream the Possible Dream (Turing Award Lecture)." *Communications of the ACM*, 1996. 39(5): pp. 105-112.
- Robertson, G., Newell, A., and Ramakrishna, K., *ZOG: A Man-Machine Communication Philosophy* . Carnegie Mellon University Technical Report Report, Number, August, 1977.