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Information Systems Analysis

Topic 4:

Combined Soft/Hard Approaches to the Analysis of Information Systems

V1.0

Objectives

- Define and explain the term combined soft/hard approach to information systems analysis
- Identify business situations where a combined soft/hard approach might be appropriate
- Define and explain the term Multiview
- Identify advantages, disadvantages of Multiview
- Provide solutions to business problems using Multiview
- Compare and contrast soft, hard and combined approaches to information systems analysis

Combined Soft/Hard Approach to Information Systems Analysis

- Although SSADM can be used solely as a methodology for analysis, it is not usual for SSM to be used alone.
- For a system to be developed that is complete in both technical and human aspects, a combined approach of hard and soft methods can be used for analysis.

When a Combined Approach might be Appropriate

- A combined approach is suitable for both small and large systems.

Examples of Combined Approach Methodologies

- ***Multiview*** – its procedures ensure that the analysis of an information system refers to the:
  - human and social activity and needs
  - technical functions and requirements

Multiview

- Multiview helps to provide answers to the following questions:
  - How does the information system further the aims of the organisation?
  - What information processing functions does it perform?
  - How does it fit into the working lives of the users?
  - How do the users relate to the interface?
  - What is its technical specification?

Steps when undertaking Multiview

- There are a number of stages to be undertaken when using the Multiview approach:

1. Analysis of human activity
2. Analysis of information and information modelling
3. Analysis and design of socio-technical aspects
4. Design of the human-computer interface
5. Design of technical aspects (hardware, software, computers, databases, control and maintenance)

Stage 1 - Analysis of Human Activity

- Human activity refers to an individual, organisation, department, etc.
- The analyst constructs a rich picture of the whole system, including the human and social aspects.
- A root definition and conceptual model of a potential system is then produced.

Stage 2 - Analysis of Information -1

- Here the entities and functions of the information system are analysed.
- The rich picture, the root definition and conceptual model produced in Stage 1 are referred to.
- The following developments are undertaken:
  - the development of a functional model
  - the development of an entity model
  - interactions of the functions and entities

Stage 2 - Analysis of Information - 2

- Development of a ***functional model***
  - The main function is identified.
  - The main function is then broken down into sub functions, normally about three or four, depending on the function's complexity.
  - The events are defined that initiate the activities specified in the functional modelling.
  - A series of DFDs are developed.
  - The functional model and DFDs are used in the next stage.

Stage 2 - Analysis of Information - 3

- Development of an ***entity model:***
  - Entities are identified.
  - Entity relationships are identified.
  - The rich picture, root definition and conceptual model should contribute to this development.
  - An entity model can then be constructed.

Stage 3 - Analysis and Design of the Socio-Technical Aspects

- Analyst constructs a design that takes into account:
  - users and their roles
  - the working environment
  - the structure of the organisation
  - hardware and software tasks
  - work-related tasks
- These are described as socio-technical alternatives and are ranked in order of their fulfilment of the system objectives and in terms of how feasible they are, e.g. costs, resources and any constraints.
- These alternatives then become inputs for the design of the human-computer interface

Stage 4 – Design of the Human-Computer Interface - 1

- This stage is concerned with the technical design of the human-computer interface .

- It takes into account the entity model, hardware and software tasks, users and their roles and work-related tasks.

Stage 4 – Design of the Human-Computer Interface - 2

- The decisions taken on how to display the information, generate user responses and interact with users will be based on the information gathered during the first two stages.

- The technical requirements become the output of this stage and the input of the next stage which is the design of the technical subsystems.

Stage 5 – Design of the Technical Aspects

- The inputs to this stage are the entity model from stage 2 and the technical requirements from stage 4.
- The entity model describes the entities and their relationships for the whole system.
- The technical requirements describe the specific hardware, software and human computer interface interaction requirements.

Advantages of Multiview

- It includes both the human and technical aspects of information systems analysis.
- It facilitates user participation in the analysis and design of the system.
- It enables the input of user knowledge and skills.
- It considers job satisfaction an important aspect of the overall system.
- It offers the analyst flexibility in approach.

Disadvantages of Multiview

- It does not offer the structured approach provided by SSADM.
- Some stages of the methodology are not always undertaken and some others are followed in a different sequence.
- It is essential that as many people as possible participate in order to achieve success.
- Users are often reluctant to participate or may not co-operate fully and therefore a detailed analysis of the human activity may not be achieved.

A Comparison and Contrast of Soft, Hard and Combined Approaches to Information Systems Analysis

- The success of what approach is taken depends on several factors:
  - size of the organisation and project
  - type of system being analysed
  - expertise and skills of the Analysts
  - participation and cooperation of all those invited to take part in the analysis

Summary

- Combined soft/hard approach methodologies
- The purpose and potential of Multiview
- Advantages and disadvantages of Multiview
- Comparison and contrast of soft, hard and combined approaches to information systems analysis

References

- Avison D. and Fitzgerald G. (2002). *Information Systems Development: Methodologies, Techniques and Tools*, 3rd Edition. McGraw-Hill Education