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Information Systems Analysis

Topic 8:
Object-Oriented IS Methodologies

V1.0

Objectives

- Define and explain the term object-oriented IS methodology
- Identify the types of object-oriented IS methodologies
- Illustrate the construction of an object-oriented methodology
- Identify advantages, disadvantages of object-oriented methodologies
- Evaluate and discuss an object-oriented methodology in the context of a business scenario

Object-Oriented Methodology

- Object-oriented methodologies do not focus solely on the processes or data of a system but view an information system as a collection of interacting ***objects*** that work together to accomplish tasks.

Types of Object-Oriented Analysis Methodologies

- There are several object-oriented techniques and tools but only three widely used methodologies:
  - ***Object Modelling Technique (OMT)*** – this topic will focus on this technique
  - ***Object Process Methodology (OPM)***
  - ***Rational Unified Process (RUP)***

Application of an Object-Oriented Analysis

- Medium to large scale projects
- Departments which plan to develop similar areas
- Organisations including businesses, banks, airports, eCommerce, etc.

OMT Analysis

- Analysis using OMT aims to produce an overall model of an organisation.
- When problems are highlighted the following tasks are undertaken:
  - an object model is constructed
  - a dynamic model is constructed
  - a functional model is constructed
- The analyst discusses each model with management.

OMT Models

- ***The Object Model (OM):***
  - illustrates the object classes, their relationships and attributes and operations as a ***Class Diagram***, which represents the static structure of the system
- ***The Dynamic Model (DM):***
  - illustrate the behaviour of the system over time and the flow of control and events in ***Event-Trace Diagrams*** and ***State Transition Diagrams (State Charts)***
- ***The Functional Model (FM):***
  - a set of DFDs that illustrate the internal processes independently from how these processes are performed

Stages in Object-Oriented Analysis

- The structure of OOA is divided into stages and each stage consists of a number of tasks which are further broken-down into sub-tasks.
- The analyst interacts with the users to identify their requirements and examines the system to identify its functions.
- The analyst then constructs a model of what the system is required to do rather than how it will be done.
- This model is made up of a set of interacting objects.

Objects and Attributes

- ***Objects*** represent real items in an information system, such as:
  - management, end users, customers, suppliers, contracts, etc.
- Each object has its ***attributes*** which describes all the aspects associated with it, such as:
  - end user's name, customer details, supplier's location, contract's expiry date, etc.

Classes

- Objects can be grouped into ***classes*** (also referred to as ***object types***), for example:
  - an end user (object) can belong to a Data Entry Department (class)
- Each class has its own attributes.

Inheritance

- Inheritance refers to the relationship between classes.
- A class can have a ***parent*** class (also known as a ***superclass***) and can inherit attributes of its parent class.
- If it has a parent class, a class is then known as a ***subclass***.
- An example of this is:
  - a company is a superclass of several departments (subclasses) in an organisation

Modelling the Requirements

- The analyst will model and document the object model, dynamic model and functional model.

- The analyst discusses each model with management and when each is verified a specification drawn up prior to system design.

Advantages of Object-Oriented Analysis

- Re-usability of analysis, objects, design and programming
- Improved communication among users, analysts, designers and programmers
- Increased consistency among the models developed
- Easy to understand
- More flexible and easier to make update in response to changing user requirements
- Systems can be developed more rapidly.
- Systems can often be developed at a lower cost.

Disadvantages of Object-Oriented Analysis

- Has been accused of being too technical and complicated
- Limited to modelling and describing what should be done rather than how it should be done
- Processes and the data flow are often poorly illustrated and/or described.

Summary

This topic covers:

- Types of object-oriented Information Systems methodology
- Object-oriented terminology
- The construction of such a methodology
- Its advantages and disadvantages
- Its role in a business scenario
- An evaluation of its role

References

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Any Questions?