Architectural models

- Different architectural models may be produced during the design process
- Each model presents different perspectives on the architecture

Architectural models

- Static structural model
  - shows the major system components
- Dynamic process model
  -

Architectural styles

- The architectural model of a

Film and picture library

Abstract machine model

- Used to model the interfacing of sub-systems
- Organizes the system into a set of layers (or abstract machines) each of which provide a set of services
- Supports the incremental development of

Control models

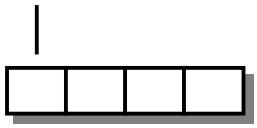
- Are concerned with the control flow between sub-systems. Distinct from the system decomposition model
- Centralized control
  -

Event-driven systems

- Driven by externally generated events
- Two principal types

Selective broadcasting

Interrupt-driven control



Object models

- Structure the system into a set of loosely coupled objects with well-defined interfaces
- Object-oriented decomposition is concerned with identifying object classes, their attributes and operations
-

Domain-specific architectures

- Architectural models that are specific to some application domain
-

Compiler model

Lexical
analysis

Symbol
table

Application

Characteristics of OOD

Advantages of OOD

- Easier maintenance. Objects may be understood as stand-alone entities
- Objects are appropriate reusable components
- For some systems, there may be an obvious mapping from real world entities to system objects

Object-oriented development

- Object-oriented analysis, design and programming are related but distinct
- OOA is concerned with developing an object model of the application domain
- OOD is concerned with developing an object-oriented system model to implement requirements
-

Objects and object classes

- Objects are entities in a software system that represent instances of real-world and system entities
- Object classes are templates for objects. They may be used to create objects
- Object classes may inherit attributes and services from other object classes

The Unified Modelling Language

Generalization and inheritance

- Objects are members of classes that define attribute types and operations
- Classes may be arranged in a class hierarchy where one class (a super-class)

Advantages of inheritance

- It is an abstraction mechanism that may be used to classify entities
- It is a reuse mechanism at both the design and the programming level
-

Servers and active objects

- Servers

An object-oriented design process

- Define the context and modes of use of the system
- Design the system architecture
- Identify the principal system objects
- Develop desi54(n)41.8d mote0.(lss)]TJ/TT4 1 Tf-0.8496

System context and models of use

-

Architectural design

- Once interactions between the system

Object identification

- Identifying objects (or object

Weather station object classes

- Ground thermometer, Barometer
  - Application domain objects that are ‘hardware’ objects related to the instruments in the system
- Weather station
  - The basic interface of Tw[Wea(herr)15(statr)1053(o)-3.9ne

Further objects and object refinement

- Use domain knowledge to identify more objects and operations

Examples of design models

- Sub-system models that show logical groupings of objects into coherent subsystems
- Sequence models that show the sequence of object interactions
-