CONCEPT

Systems Analysis and Design: UML, Data Flow Diagrams and Design Specification

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Dubai - Five-star CBD venue



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Introduction:

Information systems often reach developers as loose feature lists, so screens, data and processing rules are reinvented during coding and testers discover missing logic late. Systems analysis and design closes that gap by modelling how a system works today, how it should work and how it will be built. This Core Concept course takes analysts through feasibility, fact-finding, data flow diagrams, UML use case, activity, class, sequence and state models, then interface, report and control design. Each participant produces an Analysis and Design Specification for a case information system.

Course Objectives:

- Define a system problem, scope boundary and feasibility case within a chosen SDLC delivery model
- Gather facts on current operations with interviews, questionnaires, observation and record sampling
- Model current and target processing with levelled, balanced data flow diagrams and a supporting data dictionary
- Build UML use case, activity, class, sequence and state machine diagrams that describe system behaviour and structure
- Convert logical models into physical design specifications for screens, reports, input validation and processing controls
- Assemble an Analysis and Design Specification that developers and testers can build and verify from

Target Audience:

- IT staff who analyse existing information systems and specify changes for development teams
- Business analysts extending their work from requirements into system models and design specifications
- Junior architects and technical designers who translate models into component and interface designs
- Application support staff who document how in-house and packaged systems process data
- Test designers who derive test conditions from process, data and behaviour models

Course Outline:

Day 1: Systems Development Life Cycle, Feasibility and Fact-Finding

- SDLC Phases and the Systems Analyst's Deliverables at Each Gate
- Waterfall, Iterative and Agile Delivery Models Compared for Analysis Work
- Problem Definition Statement and System Scope Boundary
- Technical, Operational, Economic and Schedule Feasibility Assessment
- Fact-Finding Toolkit: Interviews, Questionnaires, Observation and Record Sampling

Day 2: Structured Analysis: Process Models, Data Flow Diagrams and Data Structures

- As-Is and To-Be Process Models with Swimlane Charts
- Context Diagram and Level 0 Data Flow Diagram in Gane-Sarson Notation
- DFD Decomposition, Numbering and Balancing Rules Across Levels
- Data Dictionary Entries, Process Specifications and Decision Tables
- Entity Relationship Diagram and Normalisation Overview for Analysts

Day 3: Object-Oriented Analysis with UML Diagrams

- UML Diagram Families: Structure Views and Behaviour Views
- Use Case Diagram with Actors, Include and Extend Relationships
- Activity Diagram with Decision Nodes, Forks and Partitions
- Analysis Class Diagram: Attributes, Operations, Associations and Multiplicity
- Sequence Diagram for Use Case Realisation with Lifelines and Messages

Day 4: From Logical to Physical Design: Behaviour, Interfaces, Controls and Prototypes

- State Machine Diagram for Record Lifecycle and Status Transitions
- Logical-to-Physical Design Mapping and Design Class Refinement
- Screen Layout, Navigation Map and Report Design Specifications
- Input Validation Rules, Processing Controls and Audit Trail Design
- Throwaway and Evolutionary Prototyping with Usability Walkthroughs

Day 5: Case Information System: Analysis and Design Specification

- Case Briefing: Service Request Tracking System for a Multi-Site Organisation
- Case DFD Set, Use Case Model and Class Model Build
- Sequence, State and Screen Designs for Priority Use Cases
- Developer and Tester Handover Pack with Design-to-Test Traceability
- Analysis and Design Specification Walkthrough and Peer Critique

Skills You Will Gain:

- Feasibility Analysis
- Fact-Finding
- Data Flow Modelling
- UML Behaviour Modelling
- UML Structure Modelling
- Interface and Report Design
- Input and Processing Control Design
- Design Handover Documentation

Why Attend This Course:

- Leave with an Analysis and Design Specification for a case information system, reviewed by peers
- Replace ambiguous feature lists with diagrams that developers, testers and business owners read the same way
- Spot missing processing rules, unbalanced flows and unhandled states before coding starts
- Compare modelling practice with analysts working on finance, healthcare, logistics and public service systems

Conclusion:

Well-modelled systems reach development with their processing, data, behaviour and controls already decided. The week moves from the SDLC, feasibility and fact-finding, through structured analysis with levelled data flow diagrams and a data dictionary, to UML use case, activity, class and sequence models, then state machines, physical design of screens, reports and controls, and prototyping. The final day applies every technique to a case information system and produces an Analysis and Design Specification ready to hand to developers and testers.