

Unit II — Analysis Techniques & Tools

Software Engineering and Management | BMB IT 01

Unit II: Analysis Techniques and Tools

Syllabus: Study of existing systems — information requirement analysis, system documentation; Structured analysis — Data Flow Diagrams (DFD), data dictionary concepts; Application prototype development — steps, uses, tools and strategies; Computer-Aided System Tools (CASE); Project planning fundamentals — cost estimation, work and resource estimation, risk analysis in software projects.

Exam Blueprint (2025-26 paper)

YE QUESTION BAAR-BAAR AAYA HAI

Ye unit 2025-26 ke paper me **sabse zyada** aaya — Section A me do questions (DFD, CASE, Prototype), Section B me do (Information Requirement Analysis, Risk Management), aur Section C me do (DFD symbols, Cost estimation elements). **Poore paper ka lagbhag ek tihaai is unit se tha.**

Topic	2025-26 paper	Marks
DFD — definition and symbols with example	Section A + Section C	2 & 7
Cost estimation elements	Section C	7
Risk management importance	Section B	7
Information Requirement Analysis process	Section B	7
CASE tools	Section A	2
Prototype	Section A	2

1. Study of Existing Systems

1.1 Why Study the Existing System

To understand **what** the current system does and **how**; to identify **problems, bottlenecks and gaps**; to determine the requirements of the new system; to establish a **baseline** for measuring improvement; and to understand the **data, volumes and business rules** already in use.

1.2 Information Requirement Analysis — 7-mark question

DEFINITION - RATTA MAARO

Information Requirement Analysis is the systematic process of determining **what information** the users and the organisation need from the proposed system, **in what form, how often, and for what purpose**.

The process — steps:

1. **Identify the users and stakeholders** whose requirements matter, at all three levels (operational, tactical, strategic).
2. **Understand the organisation and its business processes** — objectives, structure, existing procedures.
3. **Determine the information needs of each user group** — what decisions they take and what data those decisions need.
4. **Select and apply fact-finding techniques** (see below) to gather the requirements.
5. **Analyse and structure the collected facts** — remove duplication, resolve conflicts between users, identify missing information.
6. **Prioritise requirements** — separate the *must-have* from the *nice-to-have* (MoSCoW: Must, Should, Could, Won't).
7. **Verify and validate with the users** — confirm that the analyst has understood correctly.
8. **Document the requirements** formally in the **SRS (Software Requirement Specification)**.

Types of requirements:

Type	Meaning	Example
Functional	What the system must do	"The system shall generate a monthly sales report"
Non-functional	Quality attributes — how well it must do it	Response time under 2 seconds; 99.9% availability; security
Domain / business	Rules from the business area	"GST must be calculated at the prevailing rate"

1.3 Fact-Finding Techniques

Technique	Description	Advantages	Limitations
Interview	Face-to-face questioning of users	Deep, flexible; can probe and clarify; picks up non-verbal cues	Time-consuming; costly; interviewer bias
Questionnaire	Written set of questions distributed widely	Reaches many people cheaply and quickly; anonymous responses	Low response rate; no chance to clarify; rigid
Observation	Watching users actually do the work	Reveals what people really do , not what they say they do	Hawthorne effect (people behave differently when watched); time-consuming
Record / document review	Studying existing forms, reports, manuals, files	Objective, factual; shows actual data formats and volumes	Documents may be outdated or incomplete
JAD (Joint Application Development)	Structured workshop with users and analysts together	Fast consensus; reduces rework	Needs skilled facilitation; hard to schedule everyone

1.4 System Documentation

DEFINITION - RATTA MAARO

System documentation is the complete written record of a system — its requirements, design, code, testing, operation and use — maintained throughout its life.