

PART II
Database Development
**Requirements Collection/
Fact Finding Techniques**

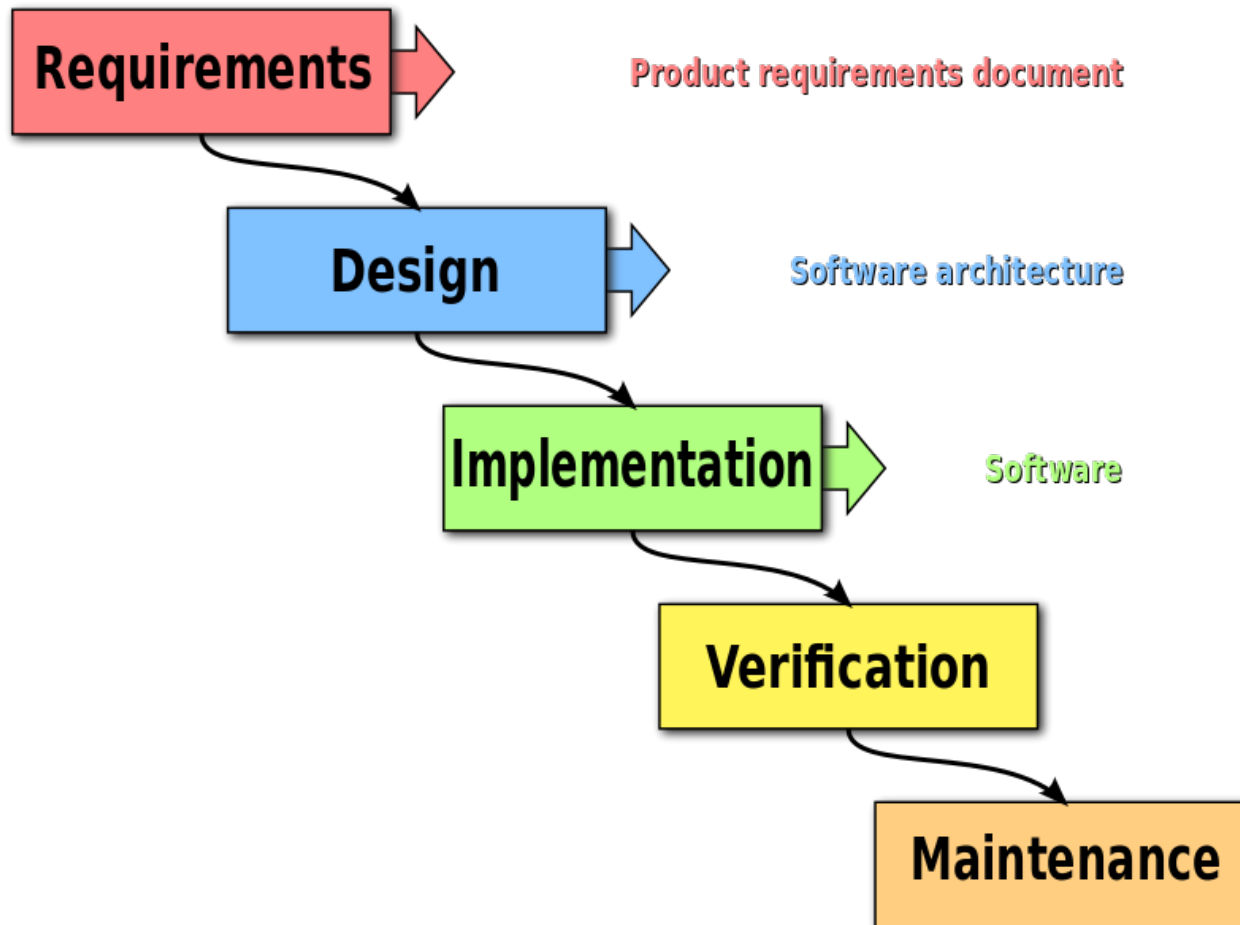
Software Development Lifecycle

- Requirements Analysis: SRS
- Design: Design Document
- Implementation: Software (*partially covered in PART I : Query Languages*)
- Testing
- Installation
- Maintenance

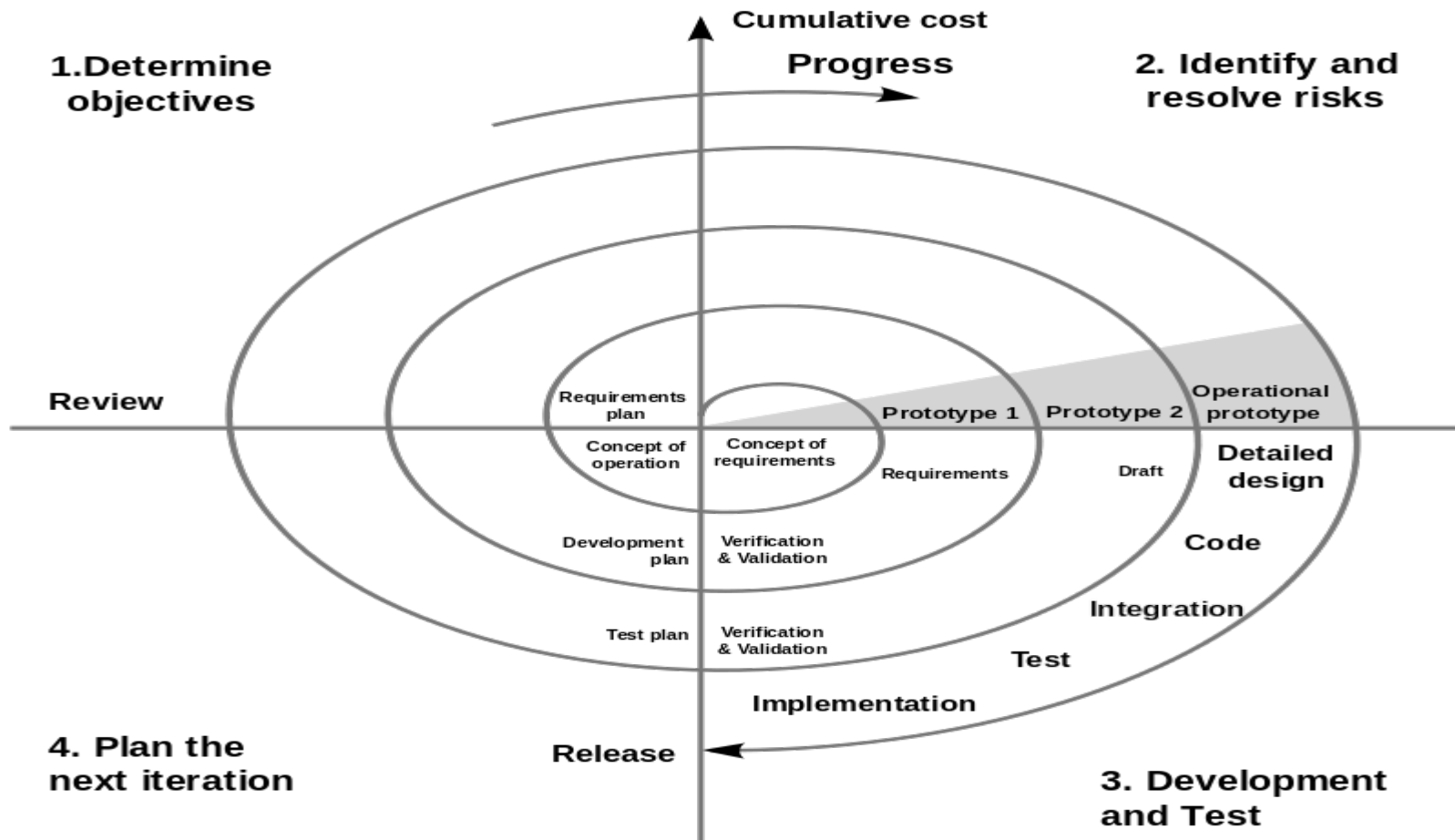
Software Development Lifecycle

- Traditional lifecycle
 - Sequential
 - Real projects rarely follow it
- Spiral lifecycle
 - Suitable for unknown domain
 - Partial development of each phase
- Prototyping lifecycle
 - User involvement large
 - User interface issues important
- **Iterative lifecycle** (we are going to follow)

Waterfall/ Sequential SDLC

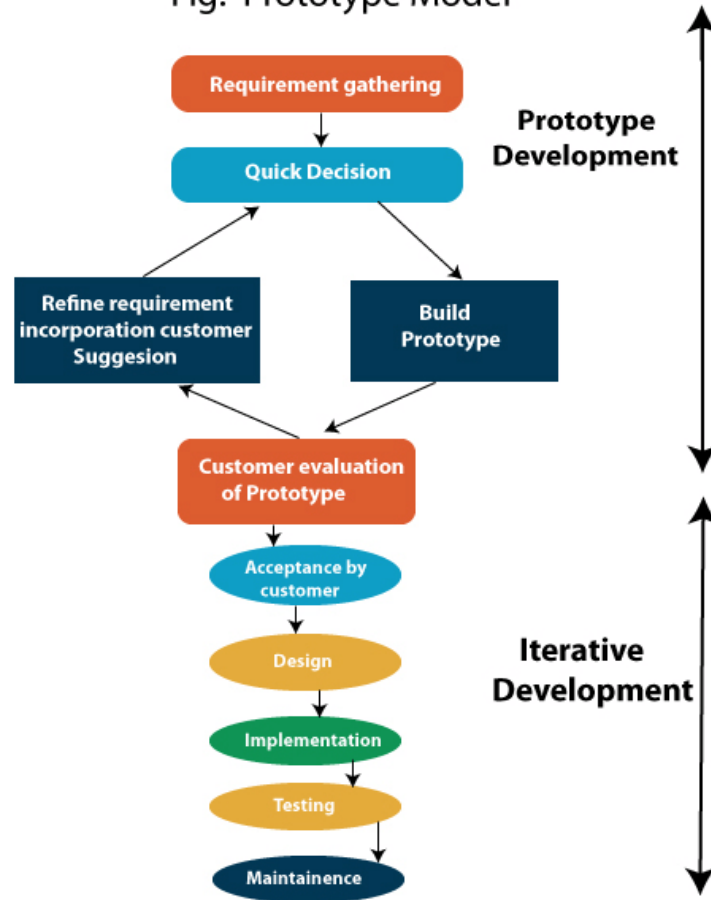


Spiral SDLC

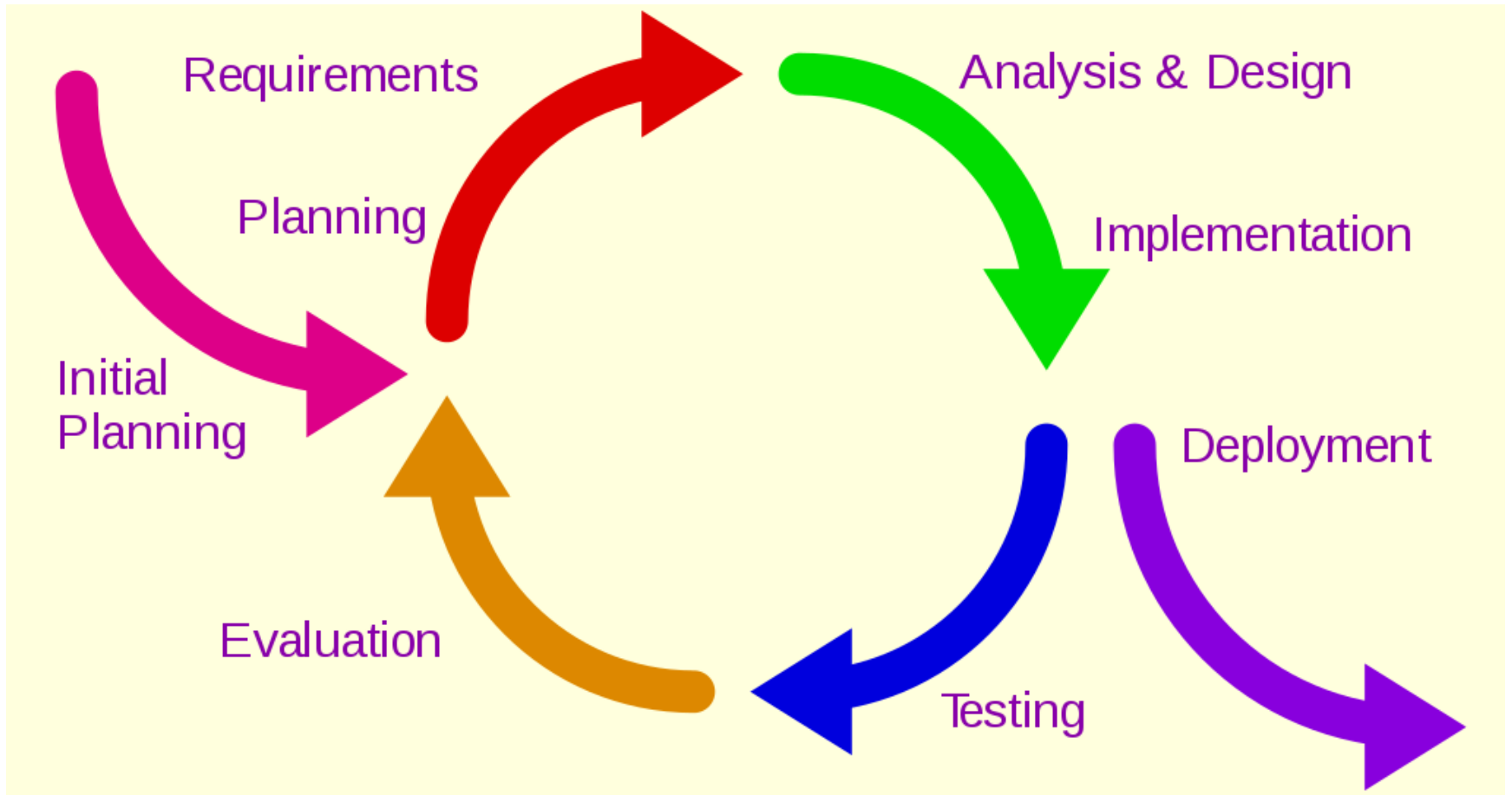


Prototype SDLC

Fig: Prototype Model



Iterative SDLC



Database Development

- Problem Definition
- Requirements Analysis
- System Requirements Specification (SRS)
- Conceptual Design (E-R, E-R to Relational, Schema Refinement)
- Physical Database Design (data volume, performance criteria, tuning)
- Hierarchy of users and securities
- Implementation
- Testing
- Maintenance

Database Design Process

- Requirements Analysis
 - What data?
 - Categories of users
 - Constraints
- Conceptual Design
 - High level description of data
 - Entity-Relationship model can be used
- Logical Design
 - E-R to Relational Mapping
- Schema Refinement
 - Analyze collection of relations
 - Identify potential problems
 - Normalization

Database Design Process

- Physical Database Design
 - Database load
 - Performance criteria
 - Building indexes on tables
 - Clustering tables
 - Database tuning
- Application and Security Design
 - Hierarchy of users and access

The complete design requires tuning where all these steps are interleaved and repeated until design is acceptable

Analysis & Design

- **Analysis:** A description of the problem & requirements: what the problem is about and what a system must do?
- **Design:** High level & detailed descriptions of the logical solution & how it fulfills requirements & constraints

Requirements Analysis

- What data is to be stored in the database?
- What users want from the system?
- Frequent queries, performance requirements (functional/ non-functional)
- Discussions with potential users, study of the existing system, study of the available documents, questionnaire
- The output is **SRS** System's Requirements Specification
- Well documented using the appropriate templates

Analysis

- **Problems**
 - Communication gap
 - Facts will rarely emerge in a neatly ordered fashion
 - Facts found by the developers are usually detailed, unstructured and sometimes conflicting
 - Clear, precise documentation

Requirements

- Create a specification of the problem domain & the requirements from the perspective of
 - Classification by objects
 - Understanding the terms used in the problem domain
- Conceptual model does not describe software components, it represents concepts in real-world problem domain
- Understanding the requirements includes understanding the domain processes & the role of the external entities
- Functionalities/Use Cases: Textual narrative descriptions of the processes in an enterprise or system

Requirements

Functional: what a system does or is expected to do (functionality)

- Descriptions of the processing the system will be required to carry out
- Details of the inputs for the system
- Details of the outputs expected from the system
- Details of the data that must be held in the system

Nonfunctional : these describe the aspects of the system that are concerned with how well the system provides the functionality

- Performance criteria such as the response time for the updation of the data or retrieving the data
- Anticipated volumes of data
- Security considerations

Requirements Collection/ Fact Finding Techniques

- Background Reading
 - Interview
 - Observation
 - Survey/ Questionnaire
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- Input and output of each technique
 - Actual FF process is a combination of any number of these 4 processes in some sequence

Background Reading

- Company reports
- Organisation charts
- Policy manuals
- Job description
- Reports
- Documentation of the existing system

Interviewing

- Most widely used fact finding technique
- Questionnaires are used if the interviewees are geographically dispersed(video conferencing??)
- Requires good planning, alertness, good interpersonal skills

Observation

- watching people carrying out their job in natural setting
- Can sort out conflicting information gathered during interviews

Survey/ Questionnaires

- Aims to obtain the views of a large number of people in a way that can be analysed statistically
- Includes:
 - postal, web-based and email questionnaires
 - open-ended and closed questions
 - gathering opinion as well as facts

YES/NO Questions

Do you print reports from the existing system?	YES	NO	10
(Please circle the appropriate answer.)			

Multiple Choice Questions

How many new clients do you obtain in a year?	a) 1–10	<input type="checkbox"/>	11
(Please tick one box only.)	b) 11–20	<input type="checkbox"/>	
	c) 21–30	<input type="checkbox"/>	
	d) 31 +	<input type="checkbox"/>	

Scaled Questions

How satisfied are you with the response time of the stock update?
(Please circle one option.)

1. Very satisfied	2. Satisfied	3. Dissatisfied	4. Very dissatisfied	12
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Open-ended Questions

What additional reports would you require from the system?

_____	_____	_____
_____	_____	_____
_____	_____	_____