

# Systems Analysis and Design

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## Introduction to the Course

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- ☑ Course structure
  - Lectures: material from the Dennis text
  - Labs: in-lab assignments, demonstrations, and consulting hours
  - Course web site:  
<http://www.bus.sfu.ca/bus362>
  - Office hours:
    - Me: Thursday “open door” after class until 5:30 PM
    - TAs: To Be Announced

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# Course Deliverables

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- ☑ Major project: 30%
  - analysis of a real-world system
    - As-is: system description (process and data)
    - To-be: process model, data model, interface mock-up (for computerized components)
  - done in teams
    - up to four people (not five)
    - all teams marked the same regardless of number
    - teamwork assessment at the end of the course

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# Course Deliverables

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- ☑ Assignments: 20%
  - nine assignments during the term
  - done in groups of up to four (not five)
    - may be same groups as major project
    - may be different groups
  - lab time and supervision is provided for completion of the assignments
  - each assignment is due the following week at the start of class
    - late assignments are not accepted
    - each group must register for each assignment using the student information system (see course home page)
    - keep a copy so that we may go over the tricky bits in class

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## Course Deliverables

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- ☑ Midterm exam: 20%
  - held in Week 8
  - covers planning and analysis stages
- ☑ Final exam: 30%
  - closed book
  - covers entire course

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## Blind Design Project

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- ☑ **As-is model**
  - create a model of the current business process
  - graphical or semi-graphical
- ☑ **Requirements specification**
  - identify the high-level requirements for a *better* business process
- ☑ **System concept (to-be model)**
  - describe the new business processes and any systems used to support the process

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# An Information System

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- ☑ Objectives
  - automate
  - informate
- ☑ Building blocks
  - data (database)
  - automation (programming language)
  - interface (forms, reports, etc.)

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# Introduction

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## Chapter 1

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## Key Ideas

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- ❑ Many failed systems were abandoned because analysts tried to build wonderful systems without understanding the organization.
- ❑ The primarily goal is *to create value* for the organization.

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## Key Ideas

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- ❑ The **systems analyst** is a key person analyzing the business, identifying opportunities for improvement, and designing information systems to implement these ideas.
- ❑ It is important to understand and develop through practice the skills needed to successfully design and implement new information systems.

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# THE SYSTEMS DEVELOPMENT LIFE CYCLE

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## Major Attributes of the Lifecycle

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- ☑ The project --
  - Moves systematically through phases where each phase has a standard set of outputs
  - Produces project deliverables
  - Uses deliverables in implementation
  - Results in actual information system
  - Uses *gradual refinement*

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## Project Phases

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- ☑ **Planning** (Why build the system?)
- ☑ **Analysis** (Who, what when, where will the system be?)
- ☑ **Design** (How will the system work?)
- ☑ **Implementation** (System delivery)

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## Planning

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- ☑ Identifying business value
- ☑ Analyze feasibility
- ☑ Develop work plan
- ☑ Staff the project
- ☑ Control and direct project

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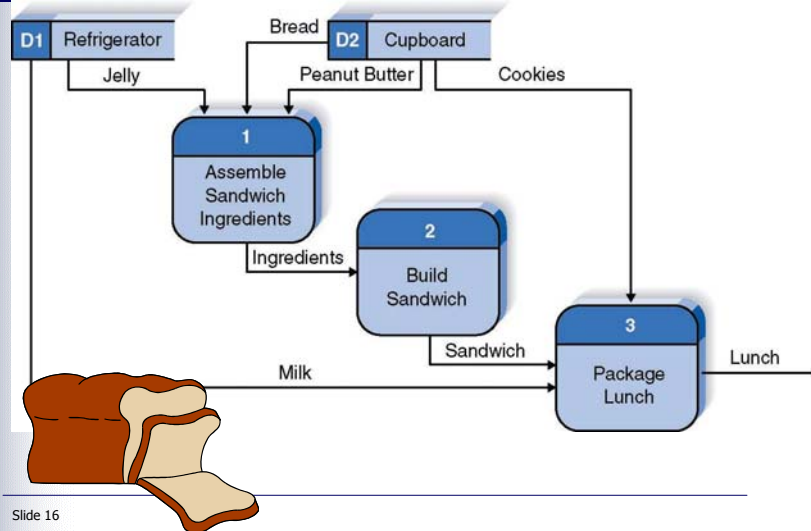


# Analysis

- ☑ Analysis
- ☑ Information gathering
- ☑ Process modeling
- ☑ Data modeling

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## A "Simple" Process for Making Lunch



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## Design

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- ☑ Physical design
- ☑ Architectural design
- ☑ Interface design
- ☑ Database and file design
- ☑ Program design

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## Implementation

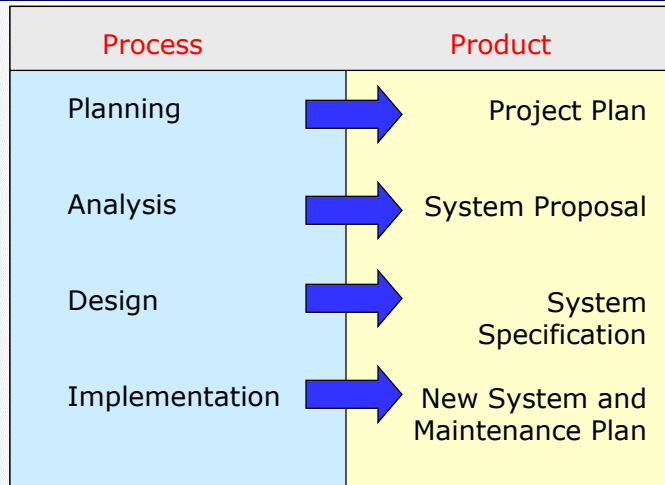
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- ☑ Construction
- ☑ Installation

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# Processes and Deliverables



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# SYSTEM DEVELOPMENT METHODOLOGIES

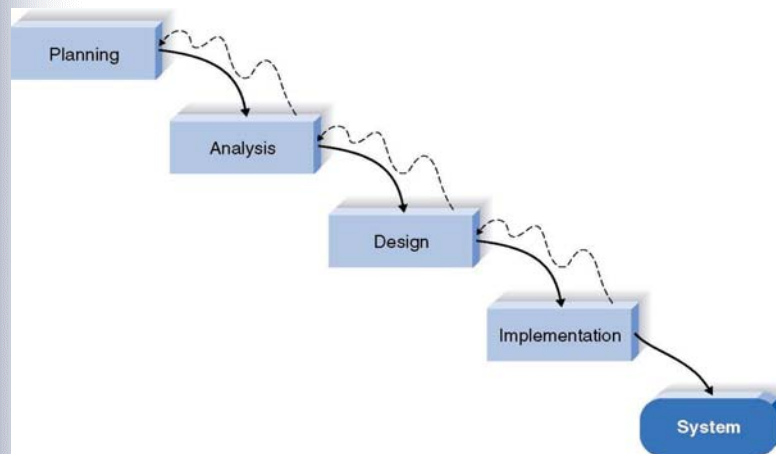
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# What Is a Methodology?

- ☑ A formalized approach or series of steps
- ☑ Examples
  - Process-Centered
  - Data-Centered
  - Object-Oriented

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# Waterfall Development Method



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# Pros and Cons of the Waterfall Method

Pros	Cons
Identifies systems requirements long before programming begins	Design must be specified on paper before programming begins
	Long time between system proposal and delivery of new system

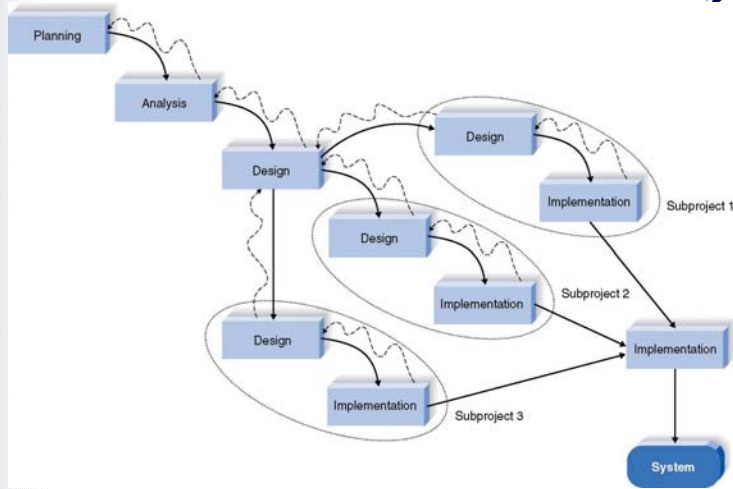
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# Alternatives to the SDLC

- ☑ Parallel Development
- ☑ Rapid Application Development (RAD)
- ☑ Phased Development
- ☑ Prototyping
- ☑ Spiral Development
- ☑ Packaged Systems

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# Parallel Development Method



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# Pros and Cons of Parallel Development

Pros	Cons
Reduces Scheduled Time	Still Uses Paper Documents
Less Chance of Rework	Sub-projects May Be Difficult to Integrate

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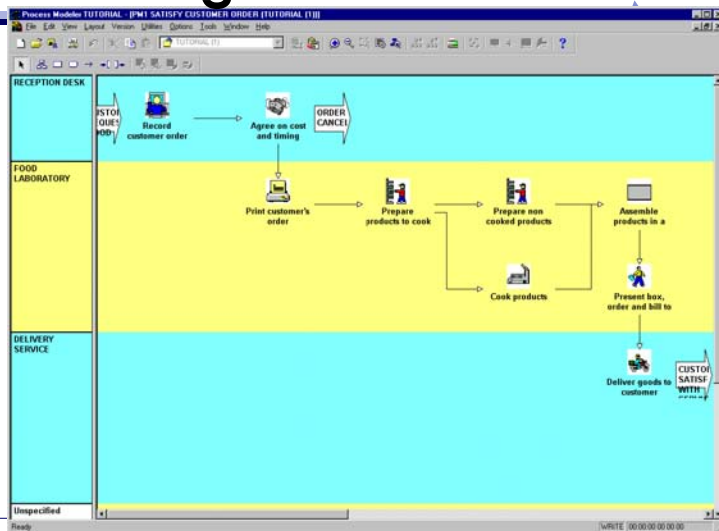
# Rapid Application Development

- ☑ CASE tools
- ☑ JAD sessions
- ☑ Fourth generation/visualization programming languages
- ☑ Code generators

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# Oracle's Designer Tool

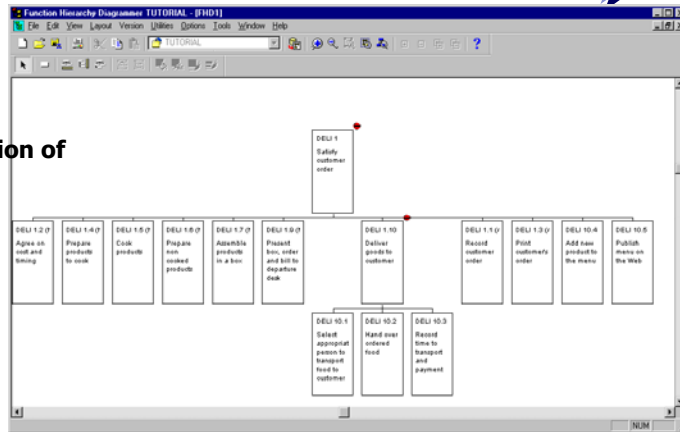
Process modeling  
(with swim lanes)



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# Oracle's Designer Tool

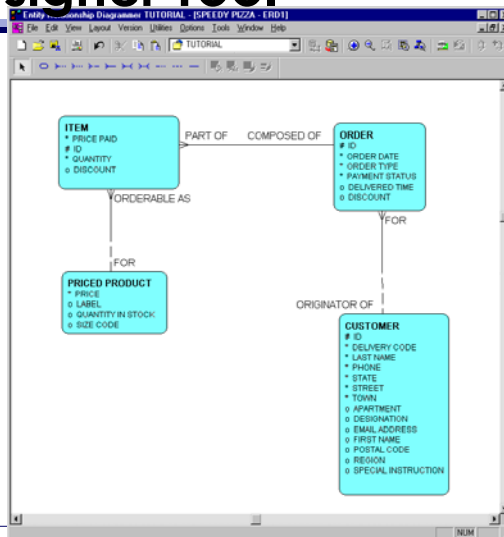
Functional decomposition of processing



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# Oracle's Designer Tool

Create an Entity-Relationship Diagram



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# Oracle's Designer Tool

Specify logical and physical details for entities in ERD

Short Name: PDT Name: PRODUCT

Plural: PRODUCTS Type Of:

Volume:

Initial: Average:

Maximum: Growth Rate:

Datawarehouse Type: <null>

Buttons: OK, Cancel, Apply, Help

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# Oracle's Designer Tool

Generate relational database from CASE tool

Mode

Run the Transformer in Default Mode

Running the Transformer in default mode creates database design elements based on:

Selected entities

All entities

Customize the Database Design Transformer

Customizing the Transformer enables you to select elements, specify how they are transformed, and define settings to meet individual requirements.

Show this tab at startup

Summary of run set

Entities	5
Tables (Mapped)	0

Buttons: Run, Commit, Show Run Set, Settings, Cancel, Help

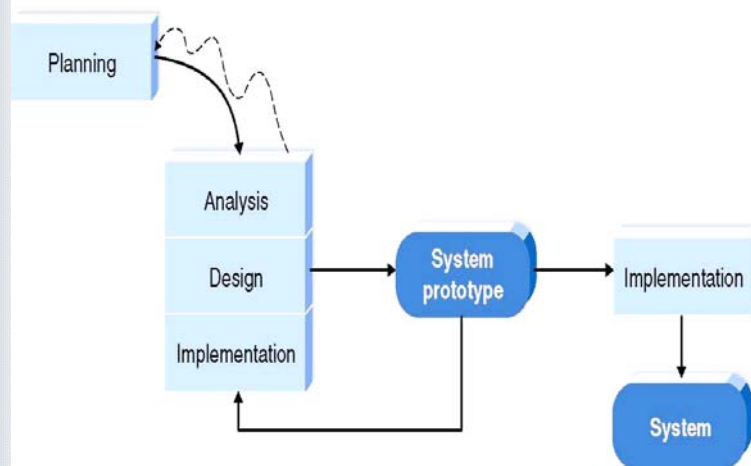
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## Three RAD Categories

- ☑ Phased development
  - A series of versions
- ☑ Prototyping
  - System prototyping
- ☑ Throw-away prototyping
  - Design prototyping

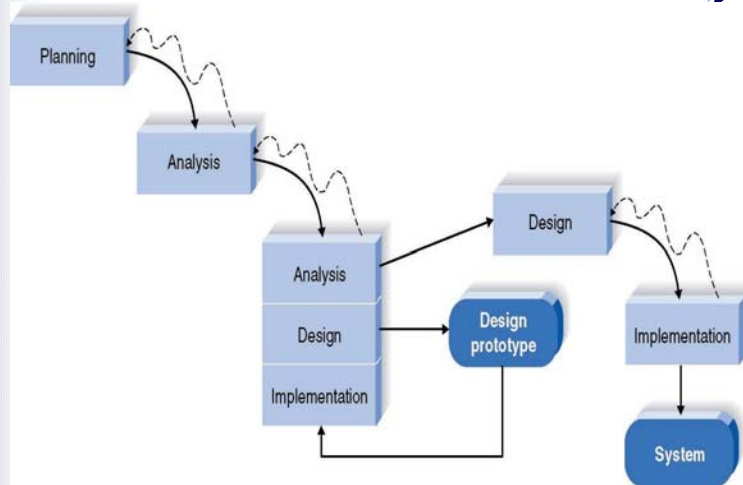
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## How Prototyping Works



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# Throwaway Prototyping



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# Criteria for Selecting the Appropriate Methodology

- ☑ Clear user requirements
- ☑ Familiar technology
- ☑ Complexity
- ☑ Reliability
- ☑ Time schedule
- ☑ Schedule visibility

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## TEAM ROLES AND SKILLS

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## Information Systems Roles

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- ☑ Business analyst
- ☑ System analyst
- ☑ Infrastructure analyst
- ☑ Change management analyst
- ☑ Project manager

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# Summary

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- ❑ The Systems Development Lifecycle consists of four stages: Planning, Analysis, Design, and Implementation
- ❑ There are five major development methodologies: the waterfall method, the parallel development method, the phased development method, system prototyping and design prototyping.
- ❑ There are five major team roles: business analyst, systems analyst, infrastructure analyst, change management analyst and project manager.