**Large Scale Systems Design**

**G52LSS**

**Lecture 2 – Large Systems Development**

- Phases of the SDLC
- Methodologies for SDLC
- Selecting Methodologies

**Learning outcomes**: describe phases, steps and deliverables of the SDLC; understand the different structured and non-structured SDLC methodologies; appreciate advantages and disadvantages of the different SDLC methodologies.

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**Phases of the SDLC**

The Systems Development Life Cycle is a gradual refinement process traditionally consisting of 4 phases:

- Planning
- Analysis
- Design
- Implementation

Each phase is composed of steps that rely on techniques. Each step is meant to produce a specific deliverable.

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**Planning Phase**

- Opportunity Identification
- System Request
- Feasibility Analysis (technical, economic, organisational)
- Project Management

→ **Project Workplan**

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**Analysis Phase**

- Develop Analysis Strategy
- Define Requirements
- Use Cases, Process Model, Data Model

→ **Systems Proposal**

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**Design Phase**

- Design Selection
- Architecture Design
- Interface Design
- Data Storage Design
- Program Design

→ **System Specification**

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**Implementation**

- System Construction
- Installation Process
- Support Plan

→ **Functional, Efficient and Robust System**
Methodologies for SDLC

- Structured Design
  - Waterfall development
  - Parallel Development

- Rapid Application Development
  - Phased Development
  - Prototyping
  - Throwaway Prototyping

- Agile Development
  - Extreme programming
  - Other agile methodologies include: Crystal, Scrum, Adaptive Software Development, Dynamic Systems Development, Feature Driven Development.

Waterfall Development
Sequential process

Parallel Development
Division into subprojects

Phased Development
Versions-based process

Prototyping
Performs phases concurrently and repeatedly

Throwaway prototyping
Uses disposable design prototypes
**Large Scale Systems Design**

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**Exercise 2.1** Suppose you are a project manager using the waterfall development methodology on a large and complex project. Your manager has just read a recent article in a magazine that advocates replacing the waterfall methodology with prototyping and comes to your office requesting you to switch approaches. What would you say? Exercise taken from (Dennis et al. 2006)

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**Selecting Methodologies**

- Difficult because no methodology is always the best
- Standards and practices vary between organisations
- Important criteria are the following

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**Exercise 2.2** Suppose you were to combine throwaway prototyping with parallel development. What diagram would illustrate the hybrid methodology? What would be the pros and cons of the hybrid methodology? Exercise taken from (Dennis et al. 2006)

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**Additional Reading**

Chapter 1 of (Dennis, Wixom and Roth, 2006)
Chapter 1 of (Kendall and Kendall, 2005)