ICT 3020 (2022/23)
Fundamentals of Software Engineering
Module 5: Class Theory Test #01 Guidelines & Review

Lighton Phiri <lighton.phiri@unza.zm>
Department of Library & Information Science
University of Zambia
http://bit.ly/39oHRDY

About Class Theory Test #01: Administrivia—Logistics

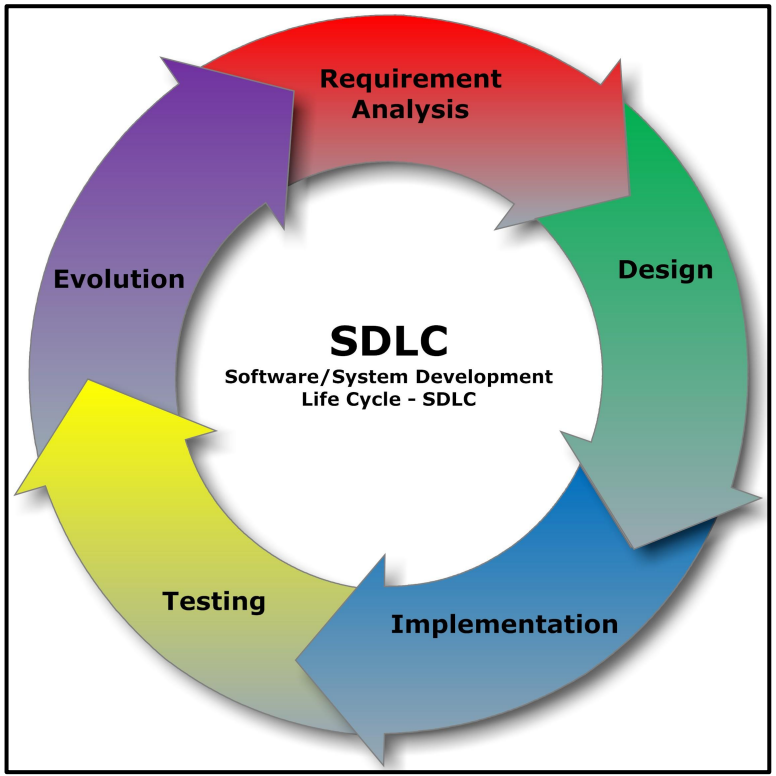
- Date: Thursday, June 1, 2023
- Time: 17H00 GMT+2
- Duration: ~60 minutes;
- Venue: 2C

About Class Theory Test #01: Coverage

- Module #2: Software Processes
- Module #3: Project Proposal Documentation and Presentation

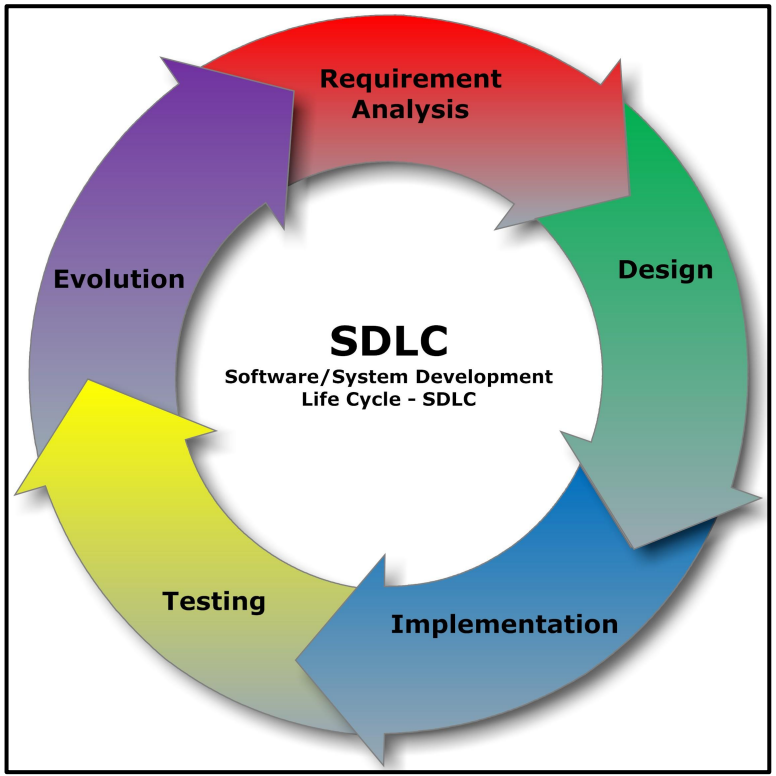
Module #2: Software Processes

- Process Activities
- Software Process Models
- Coping With Change
- Process Improvement



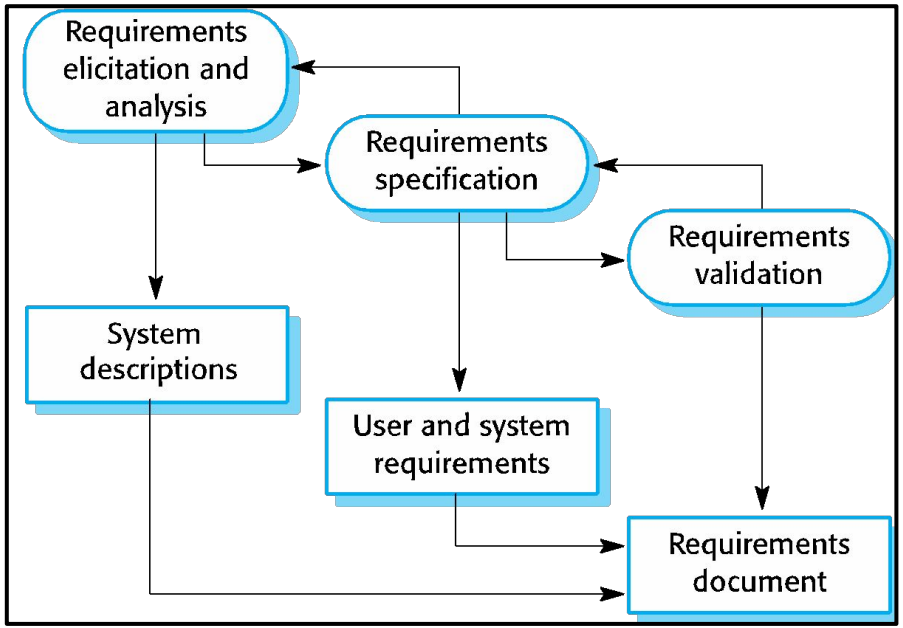
Module #2: Software Processes—Process Activities (1/6)

- **Process Activities**
  - Requirements Specification
  - Design
  - Implementation
  - Verification and Validation
  - Evolution
- **Software Process Models**
- **Coping With Change**
- **Process Improvement**



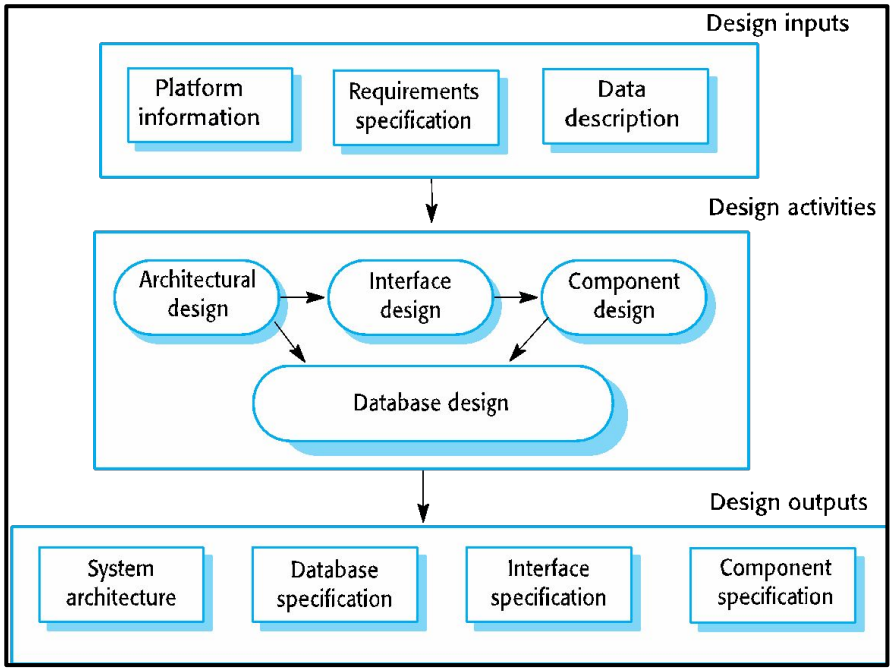
Module #2: Software Processes—Process Activities (2/6)

- **Process Activities**
  - Requirements Specification
  - Design
  - Implementation
  - Verification and Validation
  - Evolution
- **Software Process Models**
- **Coping With Change**
- **Process Improvement**



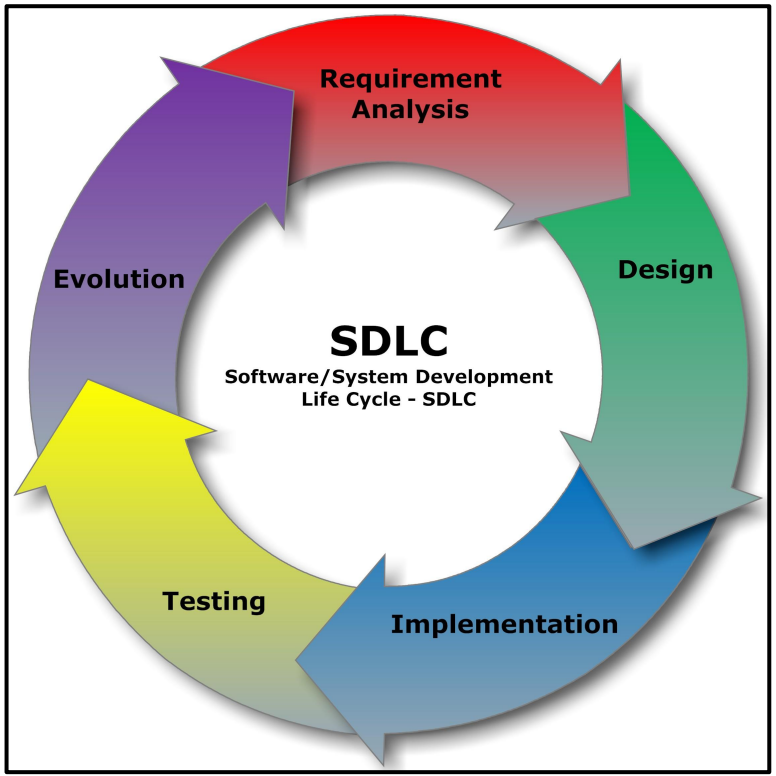
Module #2: Software Processes—Process Activities (3/6)

- **Process Activities**
  - Requirements Specification
  - Design
  - Implementation
  - Verification and Validation
  - Evolution
- **Software Process Models**
- **Coping With Change**
- **Process Improvement**



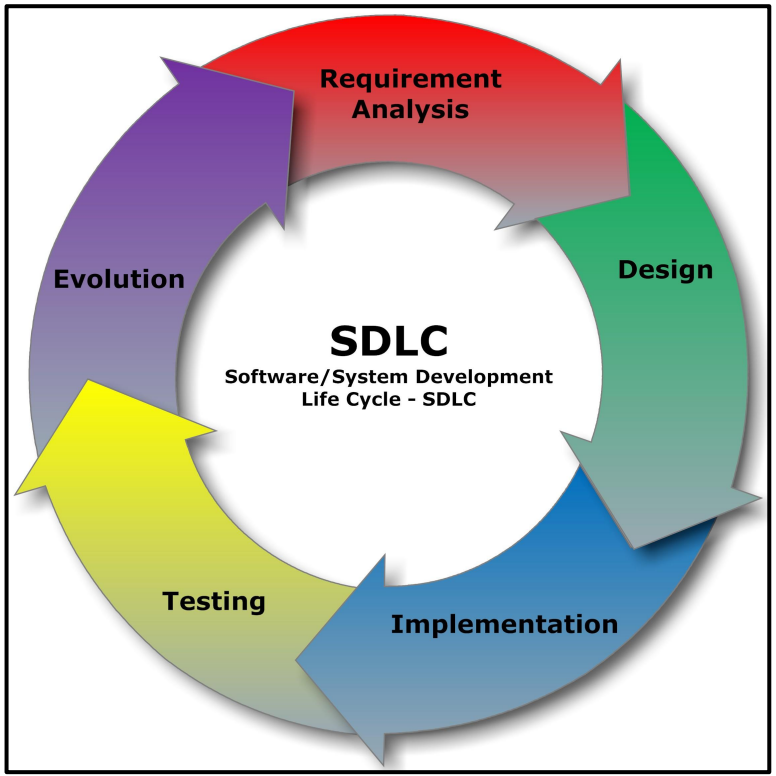
Module #2: Software Processes—Process Activities (4/6)

- **Process Activities**
  - Requirements Specification
  - Design
  - Implementation
  - Verification and Validation
  - Evolution
- **Software Process Models**
- **Coping With Change**
- **Process Improvement**

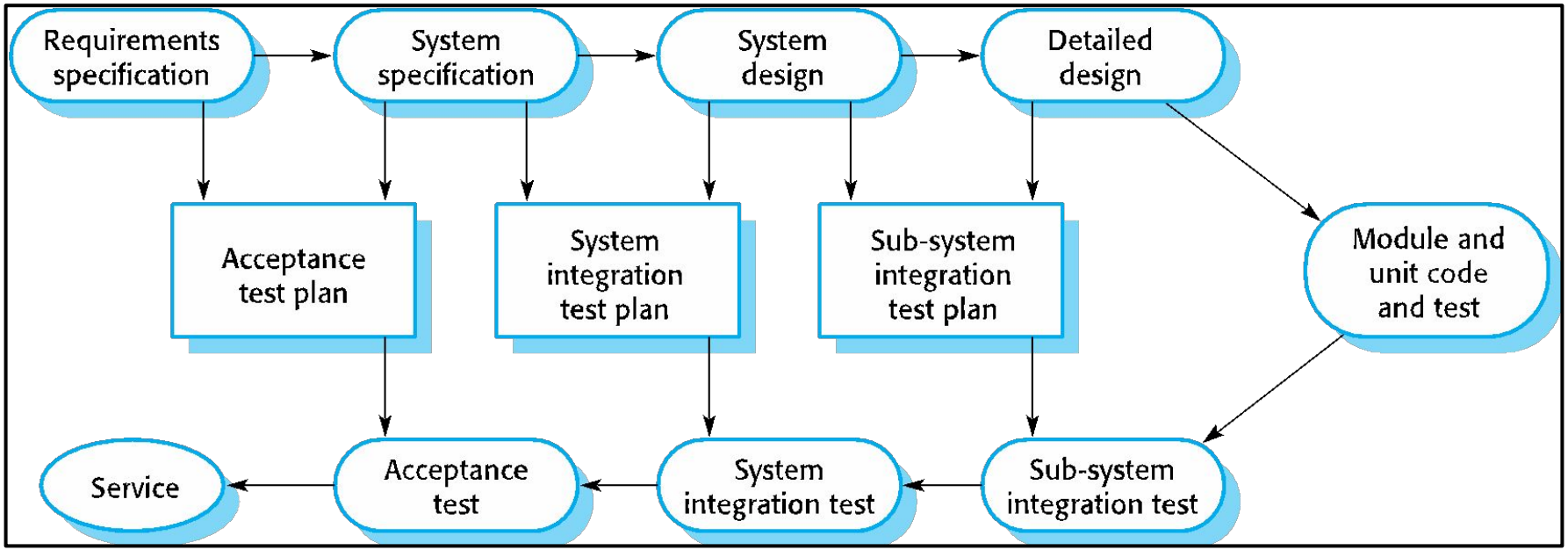


Module #2: Software Processes—Process Activities (5/6)

- **Process Activities**
  - Requirements Specification
  - Design
  - Implementation
  - Verification and Validation
  - Evolution
- **Software Process Models**
- **Coping With Change**
- **Process Improvement**



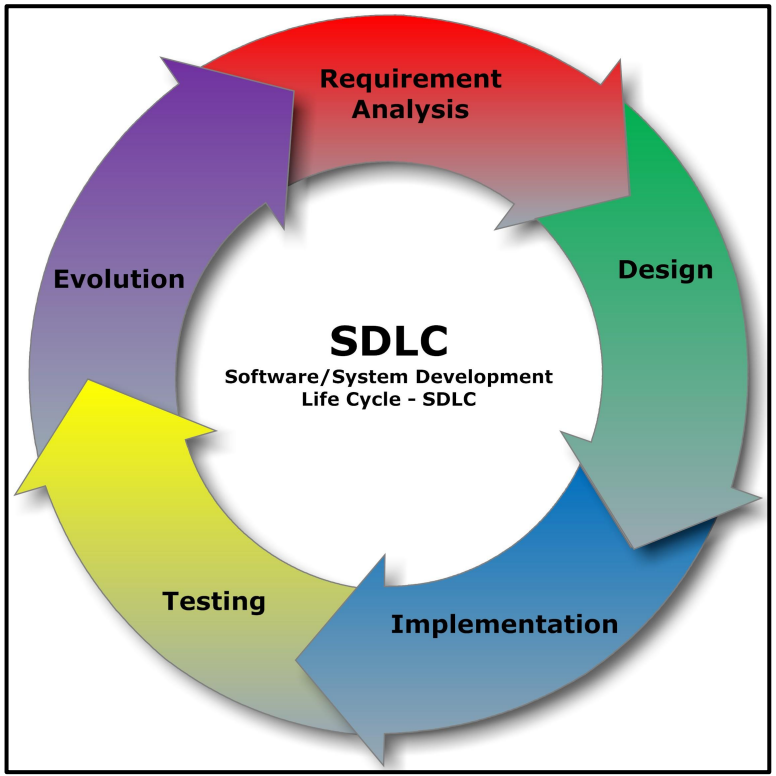
Module #2: Software Processes—Process Activities (5/6)



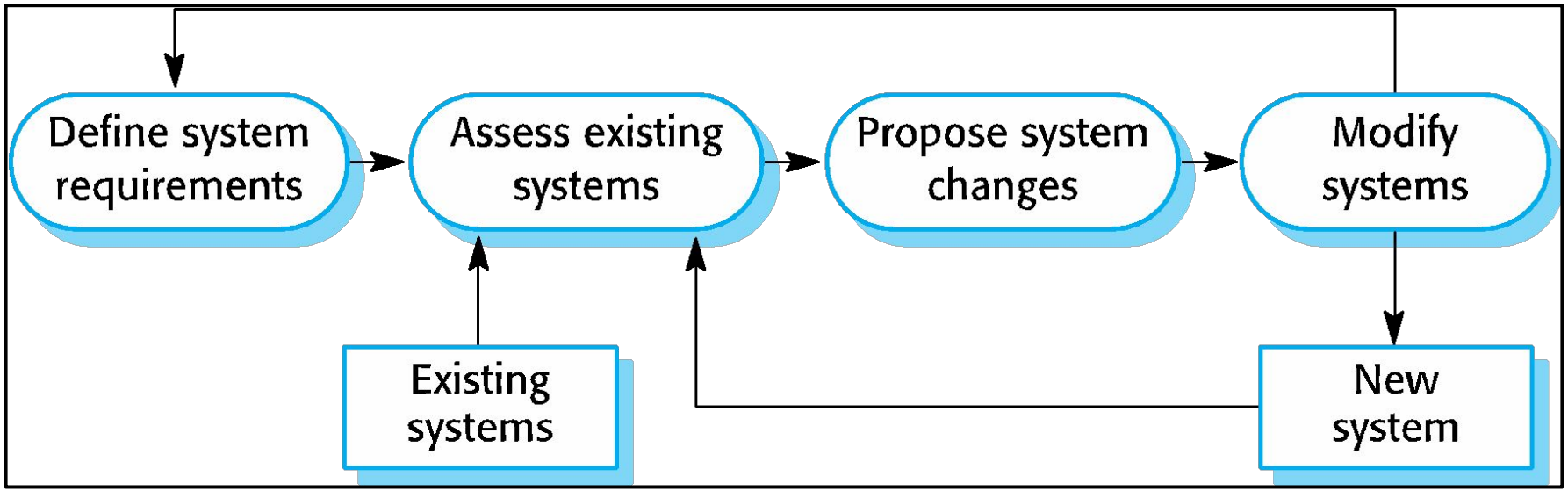
- Software testing stages

Module #2: Software Processes—Process Activities (6/6)

- **Process Activities**
  - Requirements Specification
  - Design
  - Implementation
  - Verification and Validation
  - Evolution
- **Software Process Models**
- **Coping With Change**
- **Process Improvement**



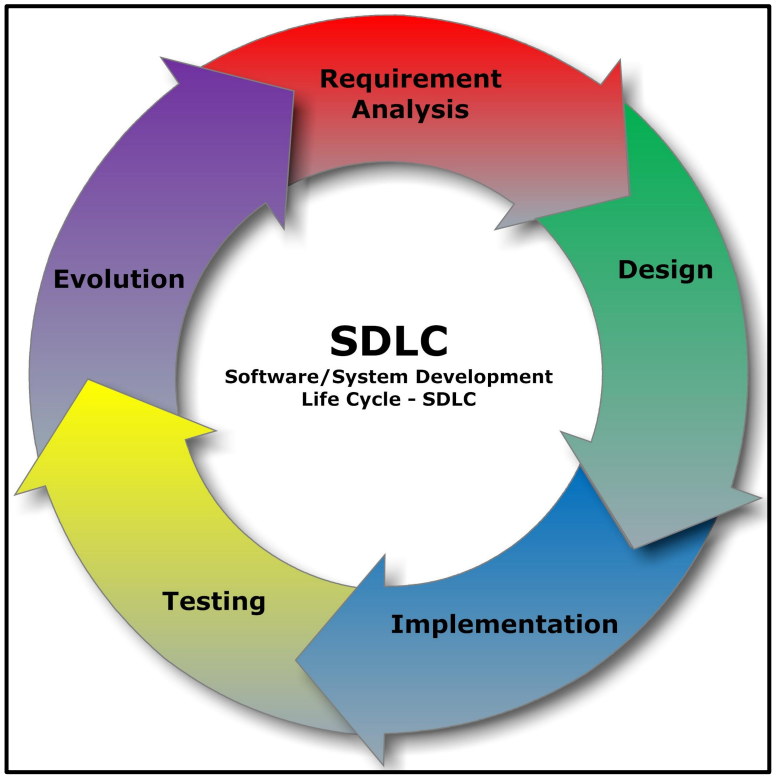
Module #2: Software Processes—Process Activities (6/6)



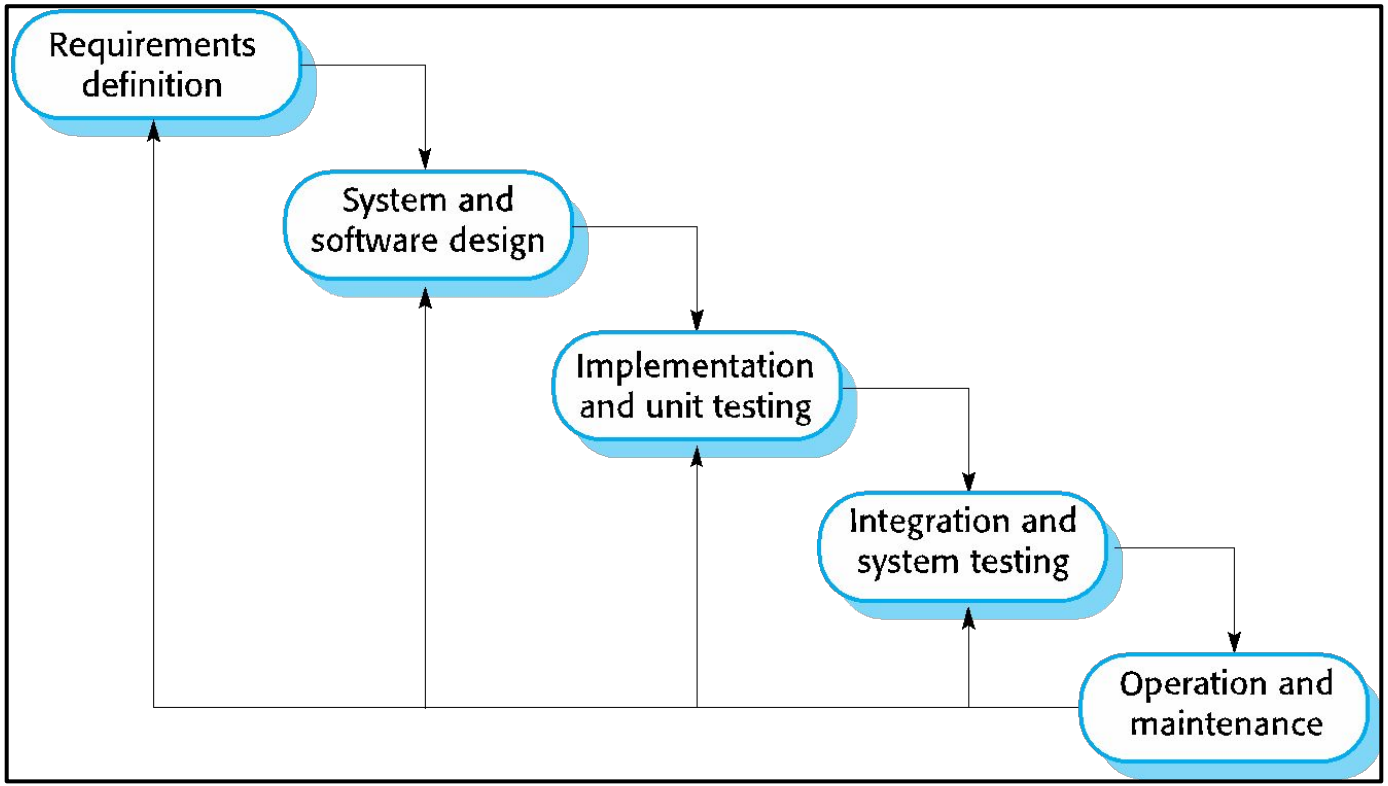
- Software system evolution

Module #2: Software Processes—Process Models (1/9)

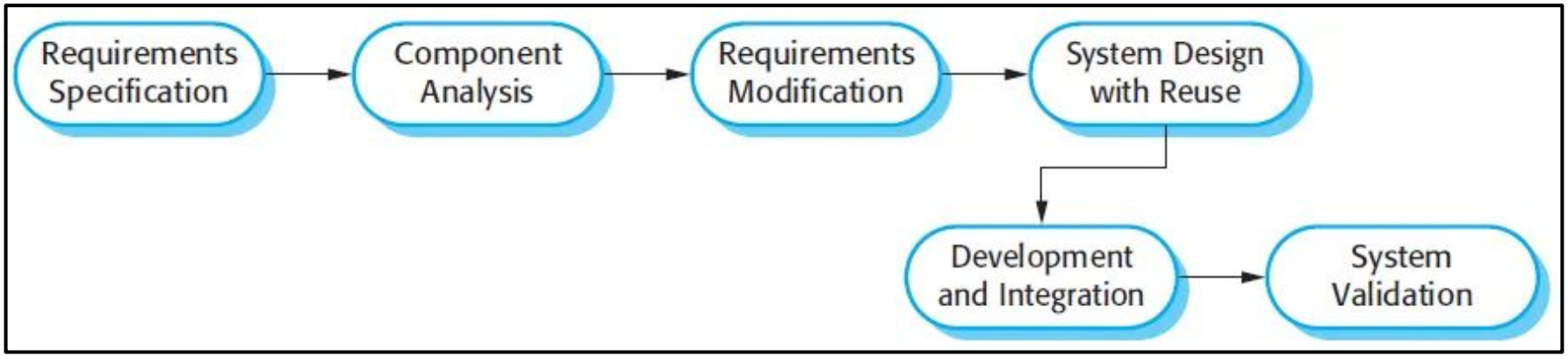
- Process Activities
- Software Process Models
  - The Software Process
  - Waterfall Model
  - Integration and Configuration
  - Incremental & Iterative Dev.
    - Rapid Application Development
    - Spiral Model; Rational Unified Process
    - Agile Methodologies
- Coping With Change
- Process Improvement



Module #2: Software Processes—Process Models (2/9)

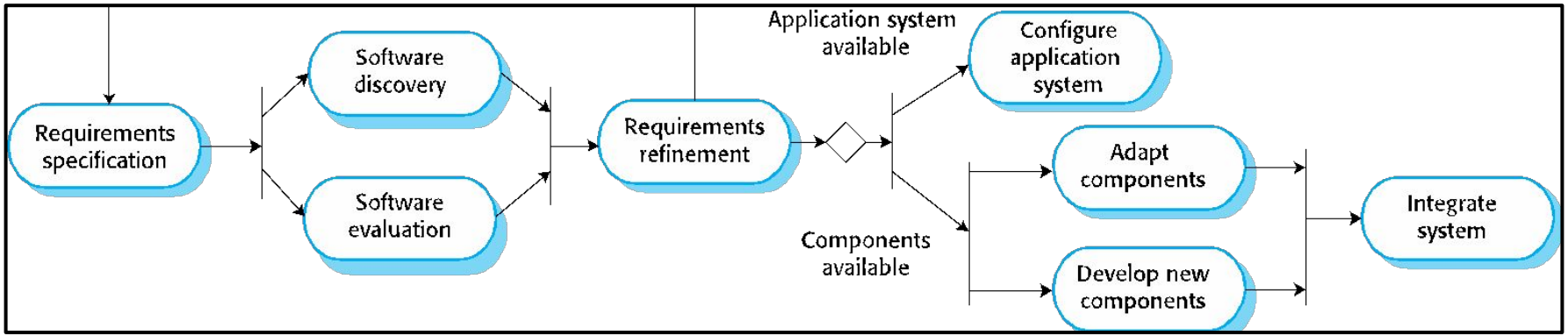


Module #2: Software Processes—Process Models (3/9)



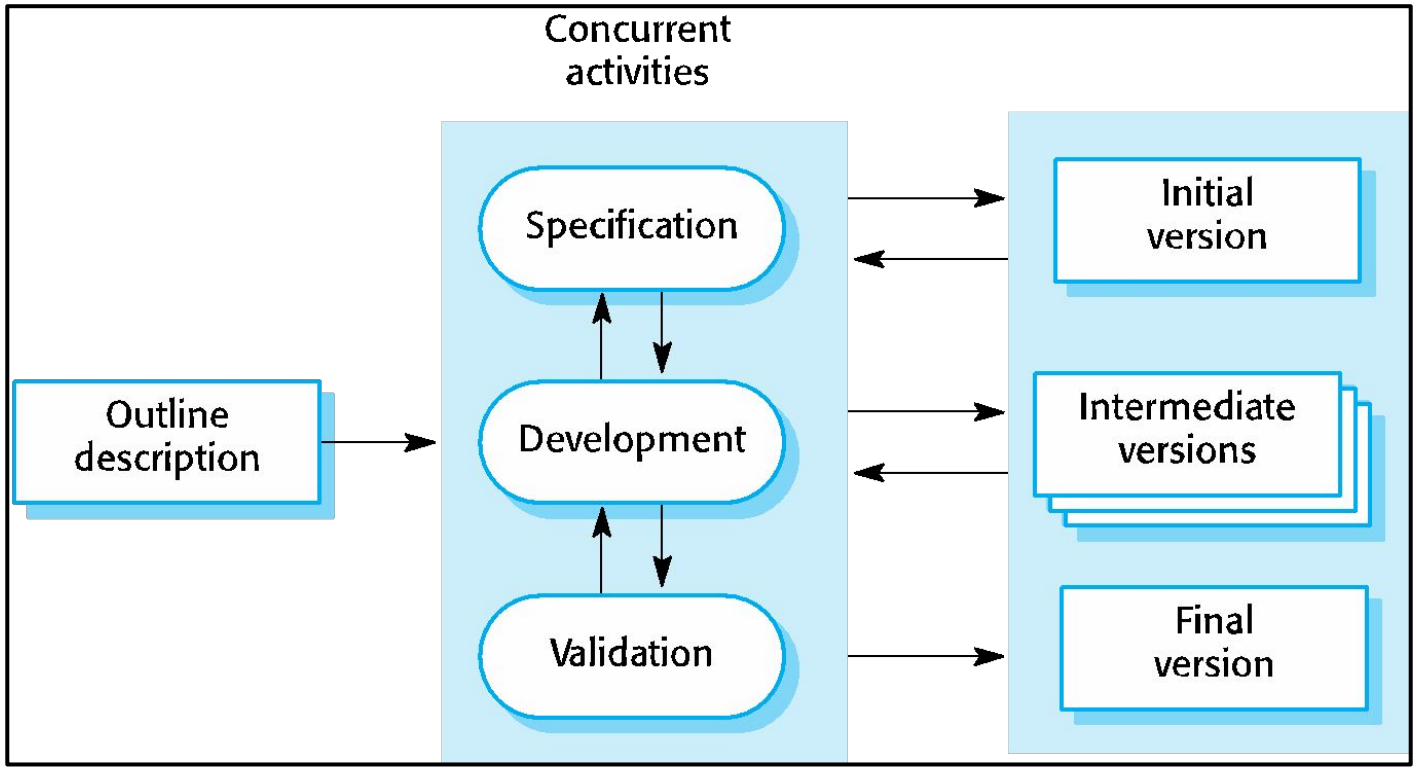
- **Reuse is crucial to modern day software development**
  - Standalone Applications
  - Modules, Libraries, Packages and Frameworks
  - Web Services
  - AI-Powered Code Generators

Module #2: Software Processes—Process Models (3/9)

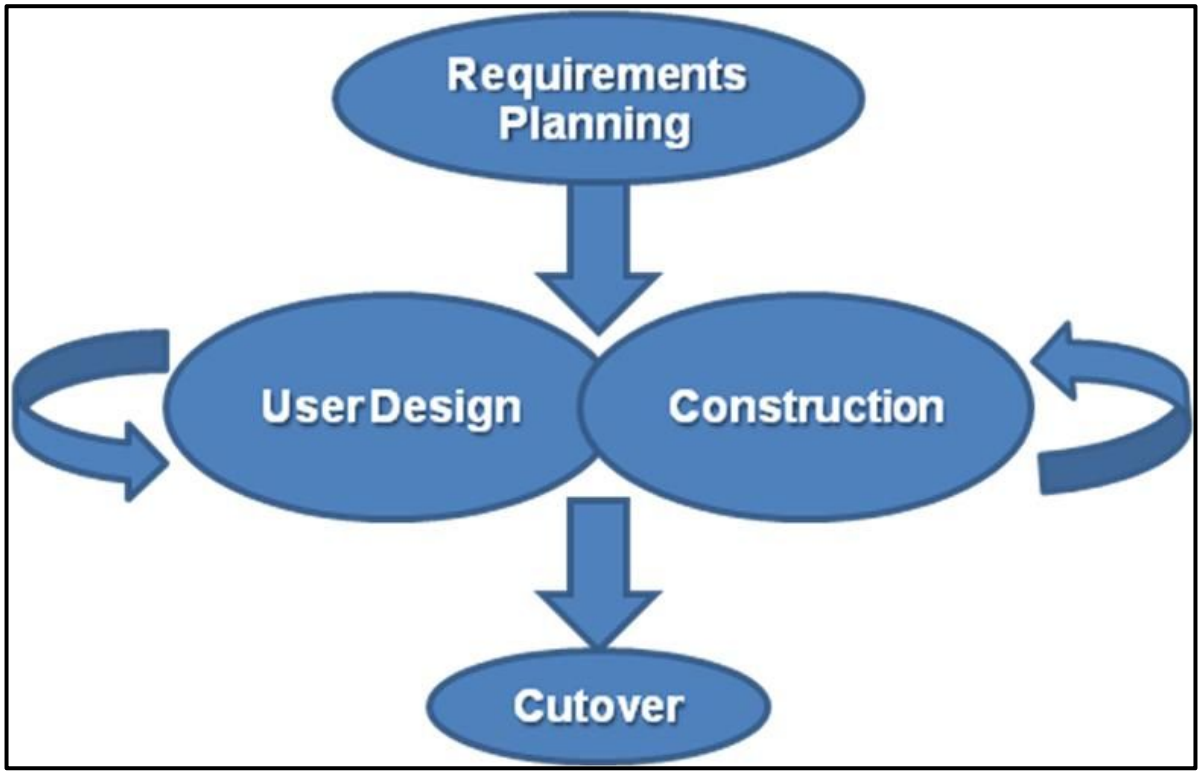


- Requirements specification
- Software discovery and evaluation
- Requirements refinement
- Application system configuration
- Component adaptation and integration

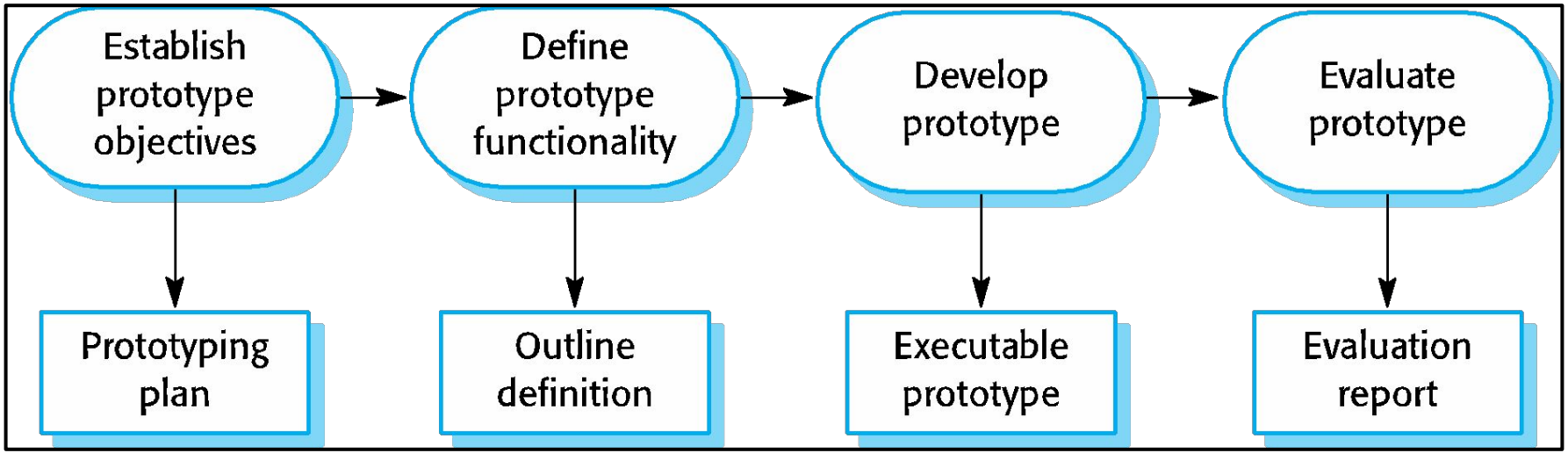
Module #2: Software Processes—Process Models (4/9)



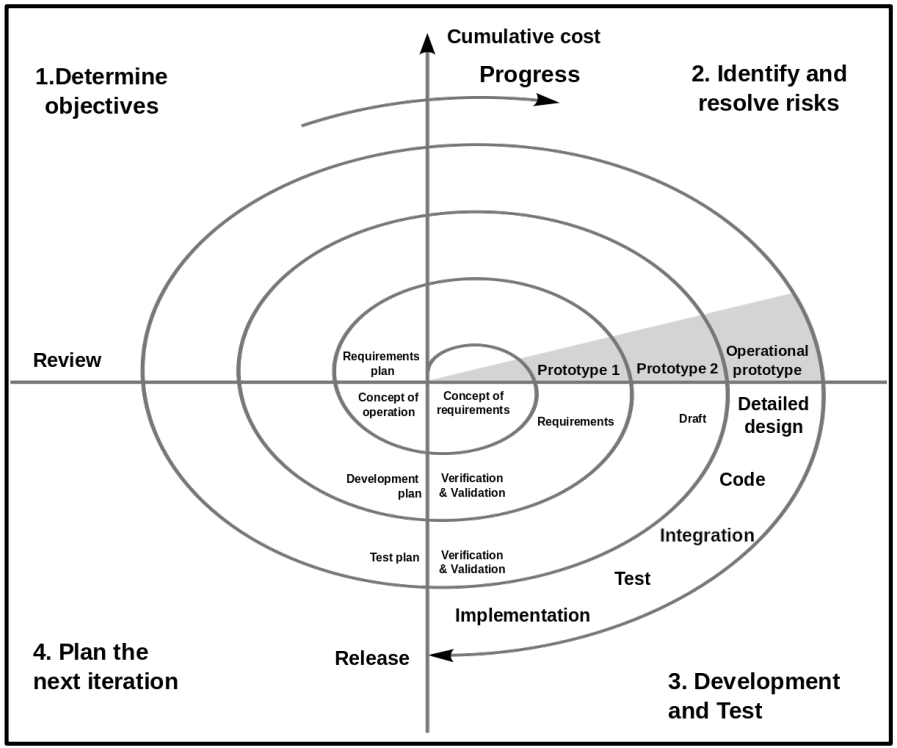
Module #2: Software Processes—Process Models (5/9)



Module #2: Software Processes—Process Models (5/9)

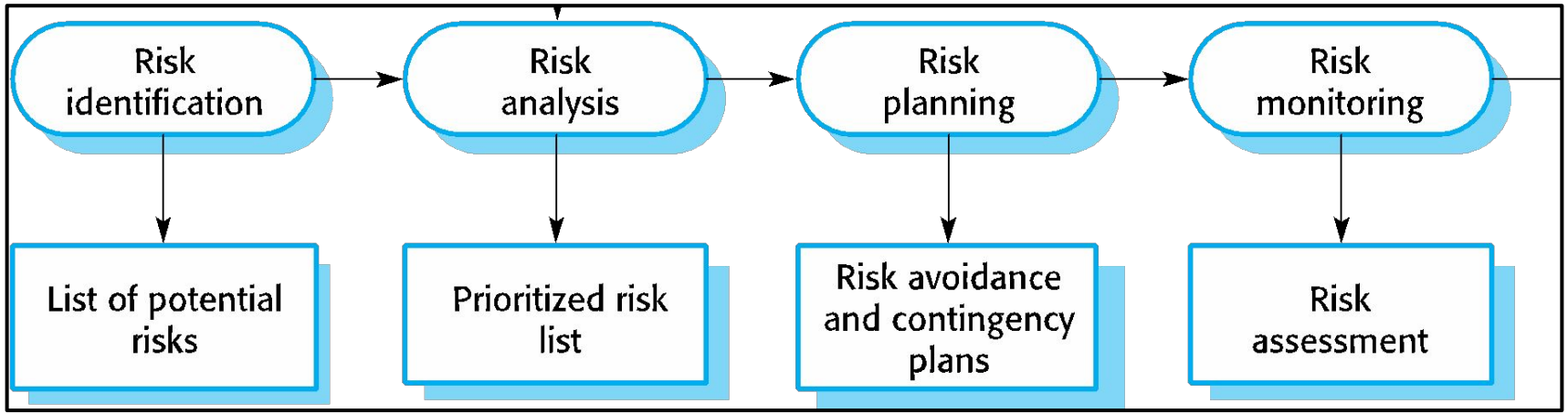


Module #2: Software Processes—Process Models (6/9)



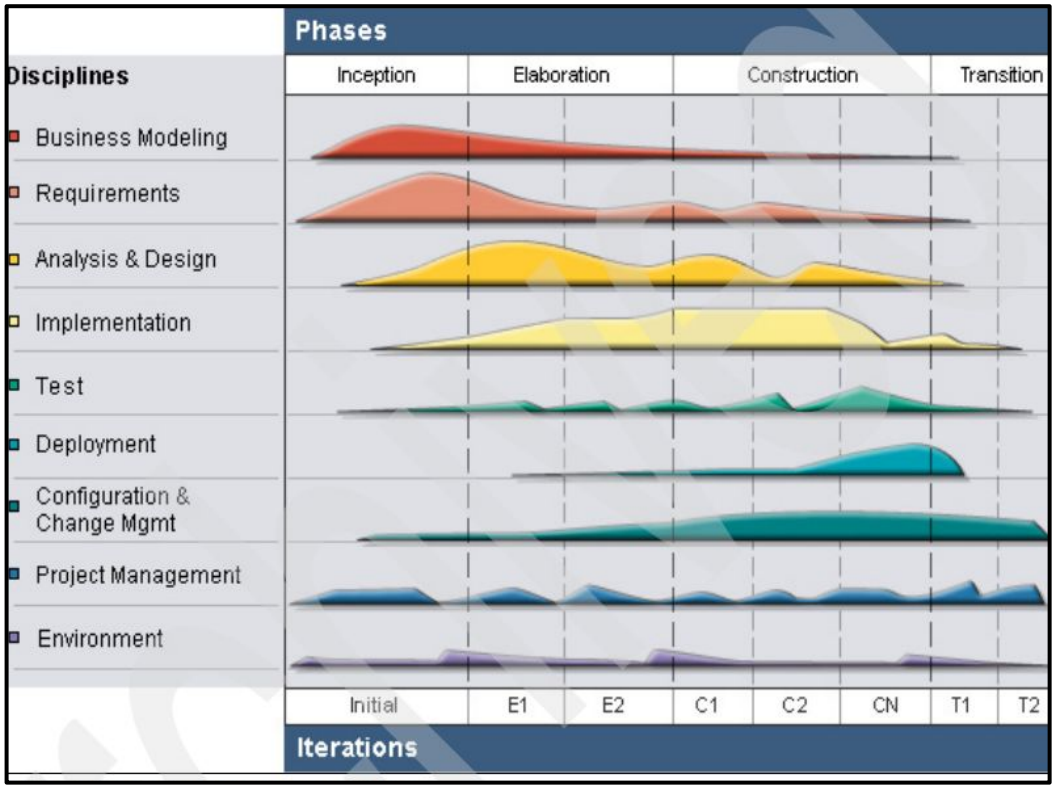
- **Spiral model focuses on how to control risk**
  - Risk assessment is crucial in identifying factors that may affect a project
  - Risks should be anticipated and their impact on the project, product and the business understood
  - Steps need to be taken to avoid these risks

Module #2: Software Processes—Process Models (6/9)



- **Risk Identification**
  - Risks are typically associated with different categories: organisational, estimation, technology
  - Identify project, product and business risks

Module #2: Software Processes—Process Models (7/9)



- Rational Unified Process (RUP) best practices and guidance for development and a disciplined approach to assigning tasks and responsibilities within a development organization

Module #2: Software Processes—Process Models (8/9)

The Agile Manifesto

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan

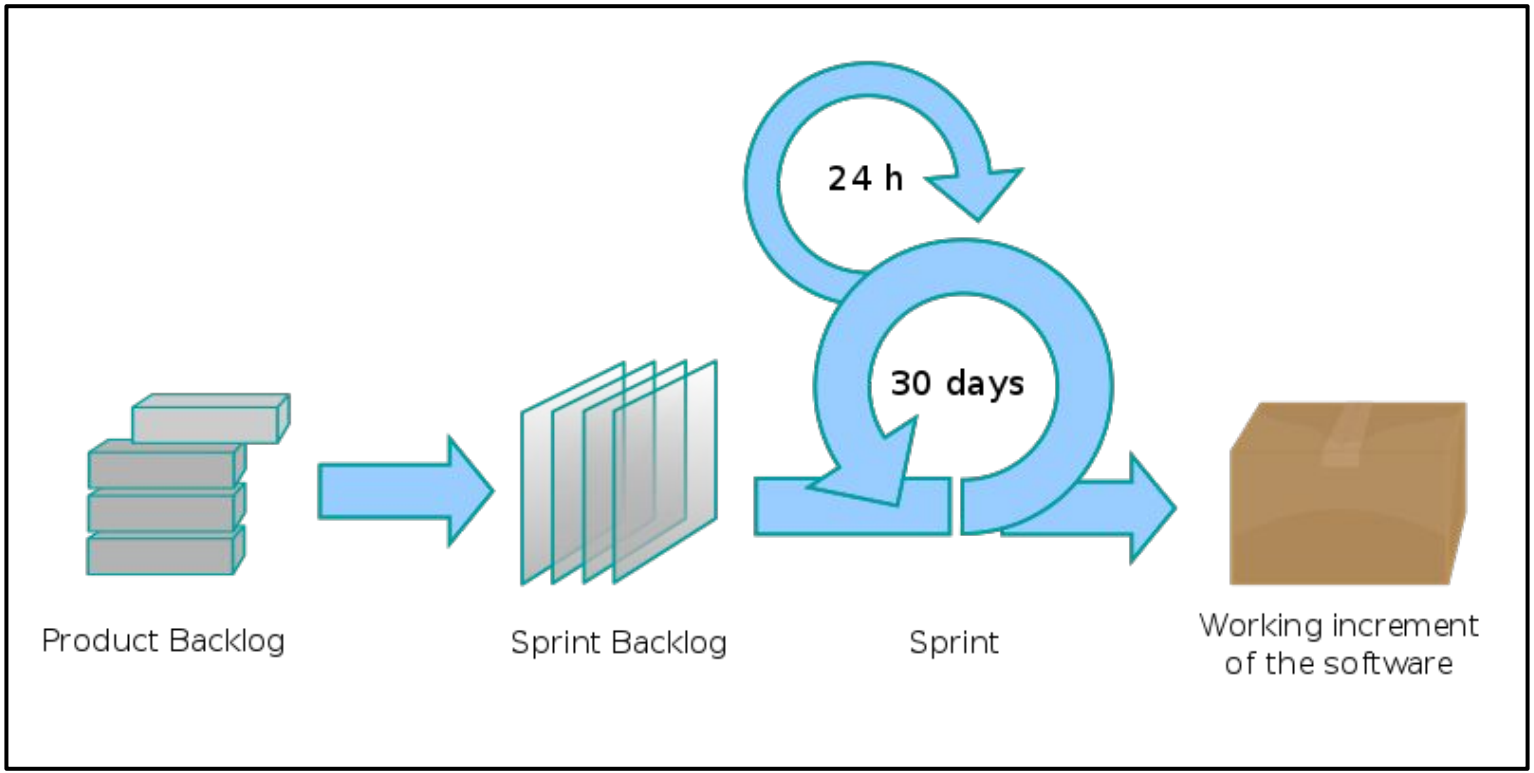
That is, while there is value in the items on the right, **we value the items on the left more.**

The Authors

Kent Beck
Mike Beedle
Arie van Bennekum
Alistair Cockburn
Ward Cunningham
Martin Fowler
Robert C. Martin
Steve Mellor
Dave Thomas
James Grenning
Jim Highsmith
Andrew Hunt
Ron Jeffries
Jon Kern

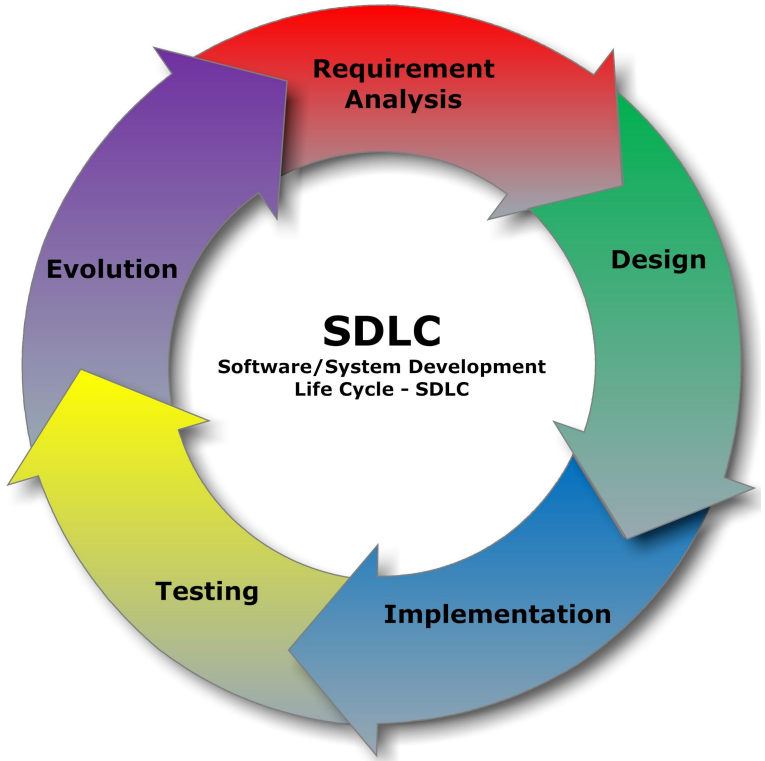
https://www.agilealliance.org/agile101/the-agile-manifesto

Module #2: Software Processes—Process Models (9/9)

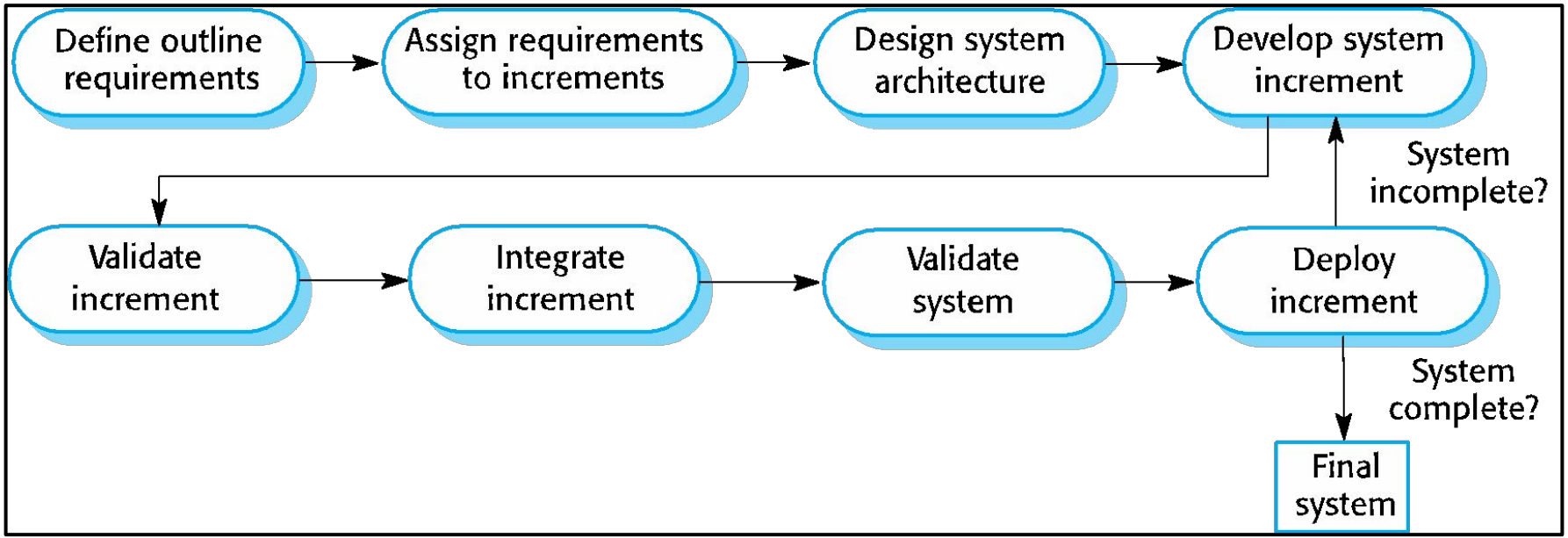


Module #2: Software Processes—Coping With Change (1/2)

- Process Activities
- Software Process Models
- Coping With Change
  - Contextualising Software Change
  - Adapting to Changing Requirements
  - Software Prototyping
  - Incremental Delivery
- Process Improvement

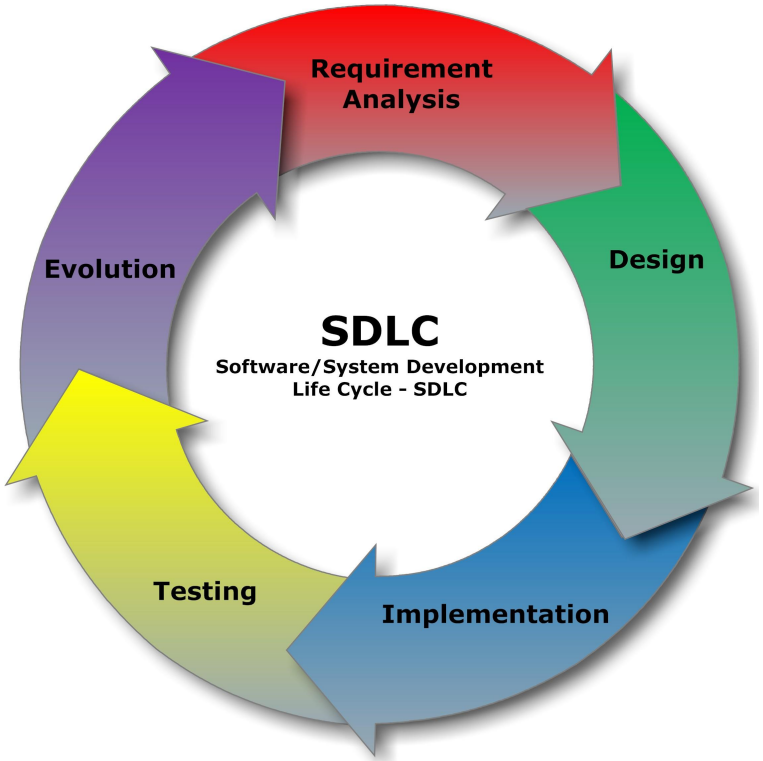


Module #2: Software Processes—Coping With Change (2/2)

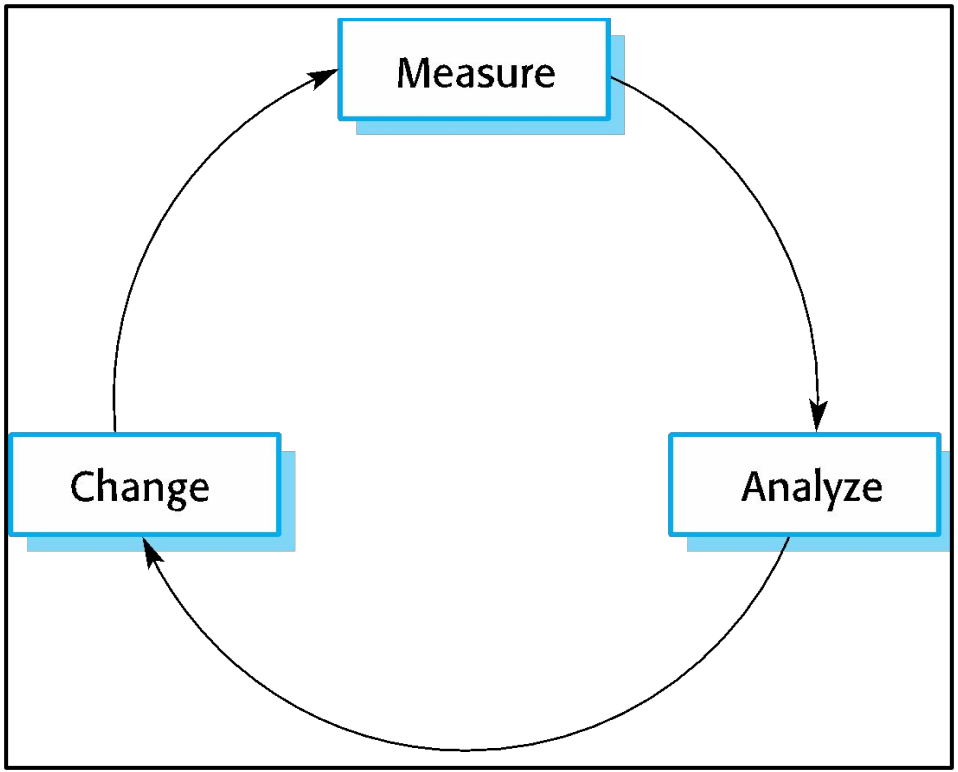


Module #2: Software Processes—Process Improvement (1/3)

- Process Activities
- Software Process Models
- Coping With Change
- Process Improvement
  - Process Improvement Techniques
  - Process Improvement Cycle
  - Process Measurement & Metrics
  - SEI Capability Maturity Model

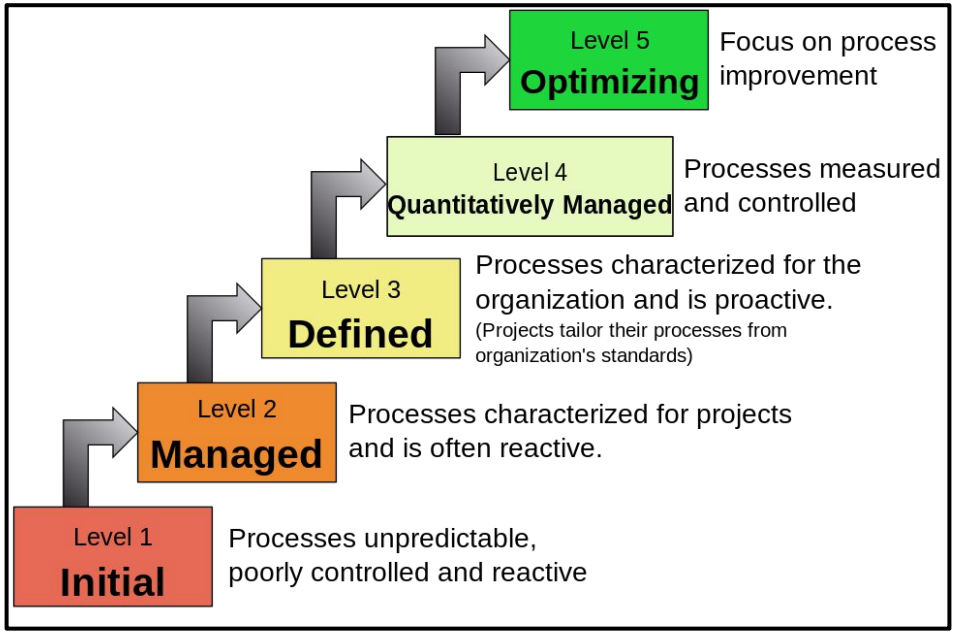


Module #2: Software Processes—Process Improvement (2/3)



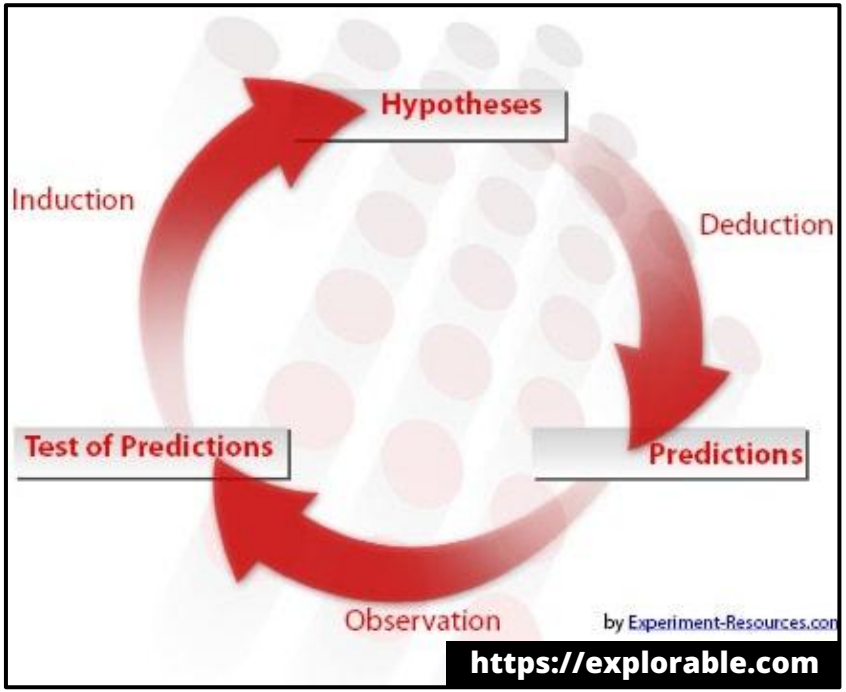
Module #2: Software Processes—Process Improvement (3/3)

- **Software Engineering Institute (SEI) proposed the Capability Maturity Model (CMM) in 1986**
  - Process maturity framework to enable organizations improve their software processes
  -



Module #3: Project Proposal Documentation and Presentation

- The Research Process
- Research Life Cycle
- Literature Review
- Proposal Document Structure
- Formatting Guidelines
- Proposal Presentation Guidelines



Q & A Session

- Comments, concerns and complaints?

ict3020@unza.zm
http://bit.ly/39oHRDY
http://bit.ly/2kK2ZkA

Bibliography

[1] **2022/23 ICT 3020 Syllabus**
http://lis.unza.zm/~lightonphiri/teaching/unza/2023/ict3020

ICT 3020 (2022/23)
Fundamentals of Software Engineering
Module 5: Class Theory Test #01 Guidelines & Review

Lighton Phiri <lighton.phiri@unza.zm>
Department of Library & Information Science
University of Zambia
http://bit.ly/39oHRDY