Introduction

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Lecture: Introduction to Software Development
Ian Sommerville Book: Read Chapters 1-3 (for basic concepts)

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Topics

- Professional software development
- Model driven software development
- Software development process
- Software development roles
- Agile software development
- Software development project

Professional software development

Individual Software Development

- Developed by individuals
- Developed for personal needs
- Consider mainly technical aspects
- Consider mainly coding stage

Professional Software Development

- Developed by team
- Developed for business needs
- Consider all technical, non-technical and global aspects of software development
- Consider full software development lifecycle stages involving planning, analysis, design, coding, testing, bug fixing, usages, maintenance & evolution

Software characteristics

Functionality or features

Performance

Maintainability

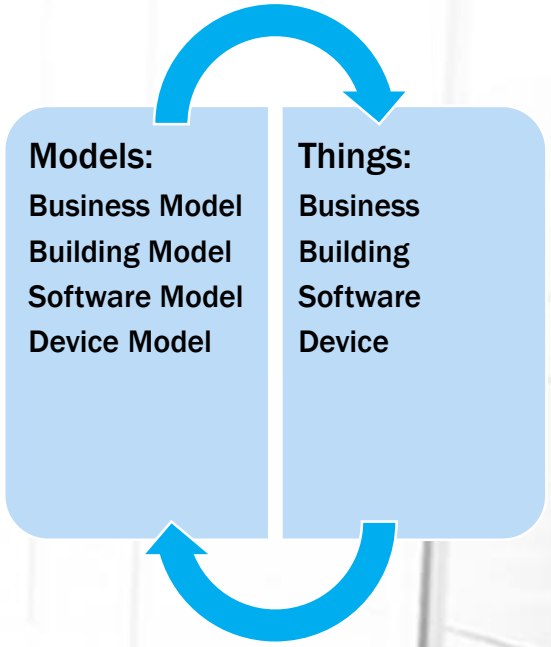
Dependability

Usability

Model driven software development

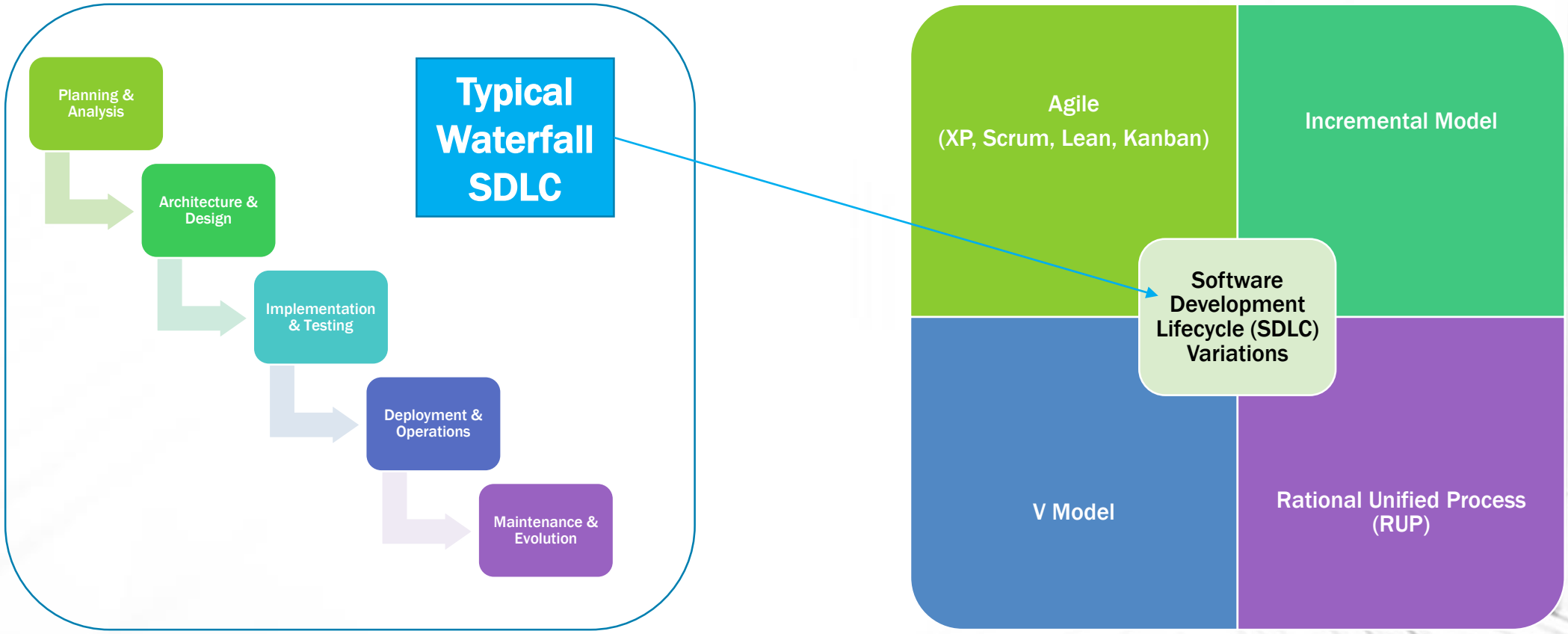
- Models
  - Stakeholders, concerns, views, viewpoints and **models**
  - Developing solution (systems) from models
- Model Representation (Modelling)
  - Textual, diagram, matrix, list, map, chart, media etc.
- Model Driven X (MDX)
  - Model Driven Development (MDD)
  - Model Driven Engineering (MDE)
  - Model Driven Architecture (MDA)
- Physical, Digital, Abstraction and Automation
  - Computation Independent Model (CIM)
  - Platform Independent Model (PIM)
  - Platform Specific Model (PSM)

Object Management Group (OMG)

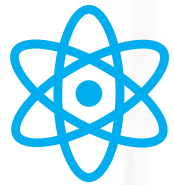


Reference: http://www.omg.org/mda/mda_files/Cephas_MDA_Fast_Guide.pdf

Software development process



Software development roles



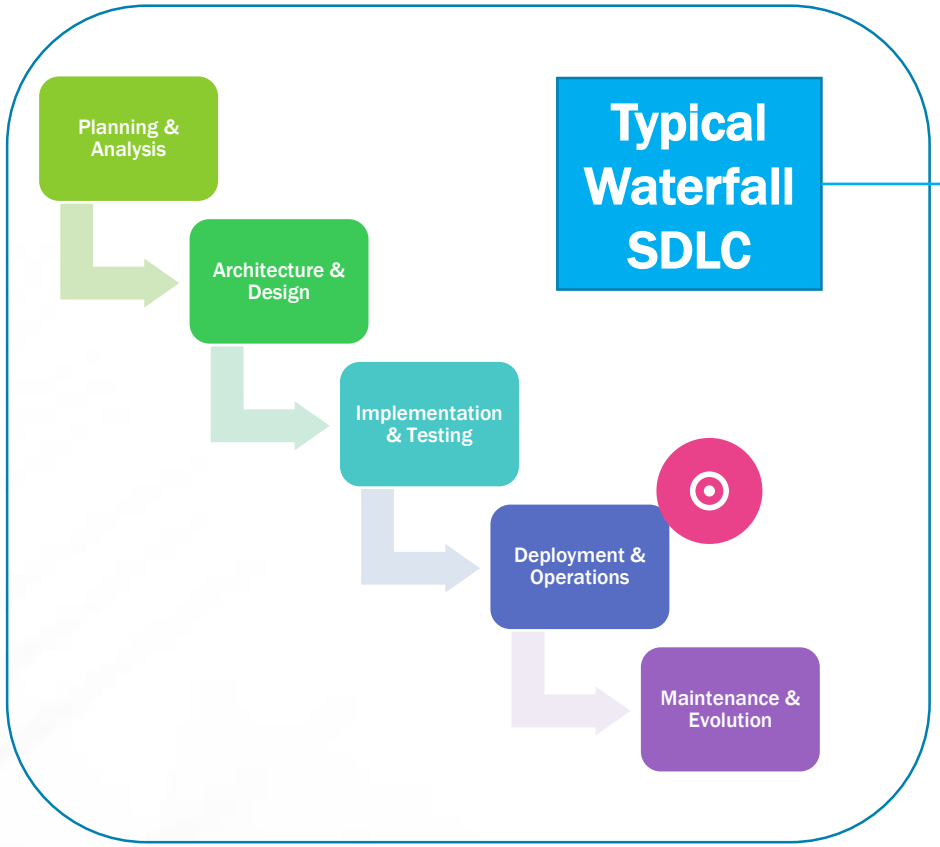
IT team

- Project Manager (IT)
- Coach
- Scrum Master
- Business Analyst (IT)
- Architect
- Developer
- Tester
- Security SME
- Integrator
- Trainer
- IT Operations
- ..

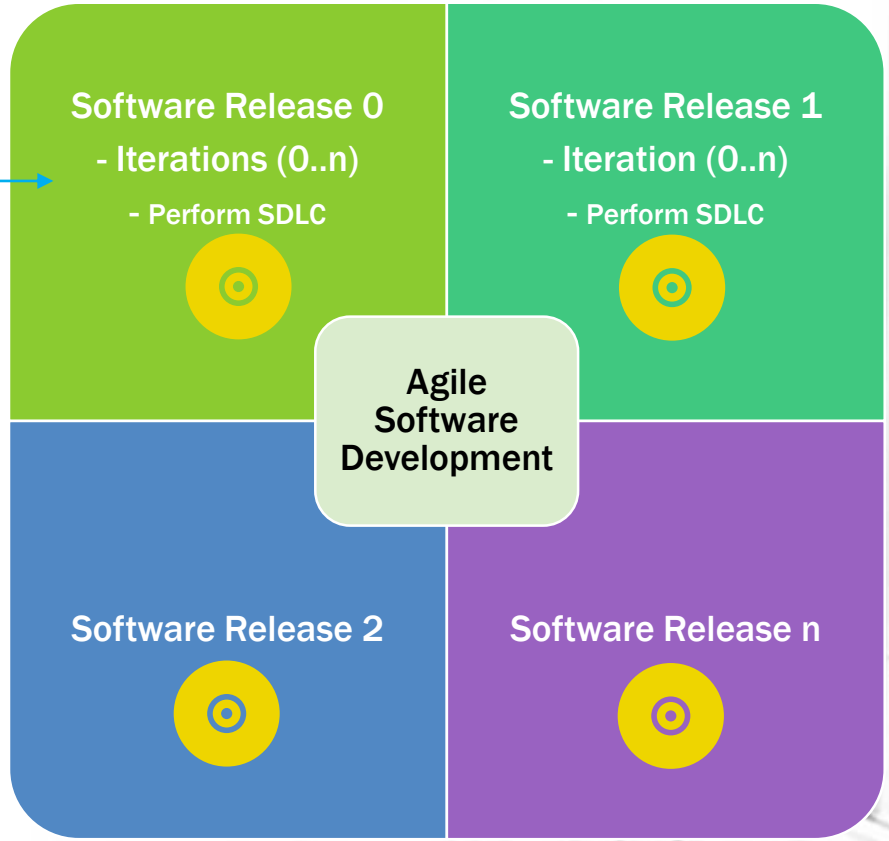
Business team

- Project Manager (Business)
- Business Analyst (Business)
- Software Product Sponsor
- Software Product Owner
- Software Product User
- ...

Agile software development

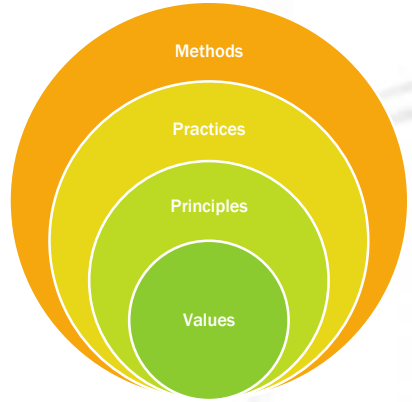


Big bang Software Delivery



Incremental Software Delivery/ Release

Agile software development



Agile Manifesto

Agile Values & Principles

Agile Methods & Practices

Agile Benefits

Agile Challenges

Agile Manifesto: http://agilemanifesto.org/

Agile Methods: An evaluation of the degree of agility in six agile methods and its applicability for method engineering by A Qumer, B Henderson-Sellers. Information and software technology 50 (4), 280-295.

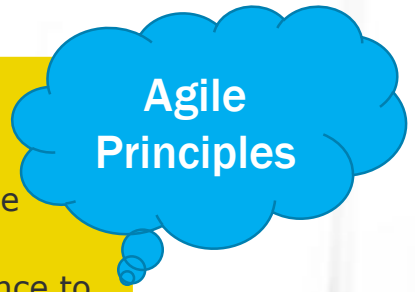
Agile software development

Agile Values

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

Agile Manifesto: http://agilemanifesto.org/

Agile software development



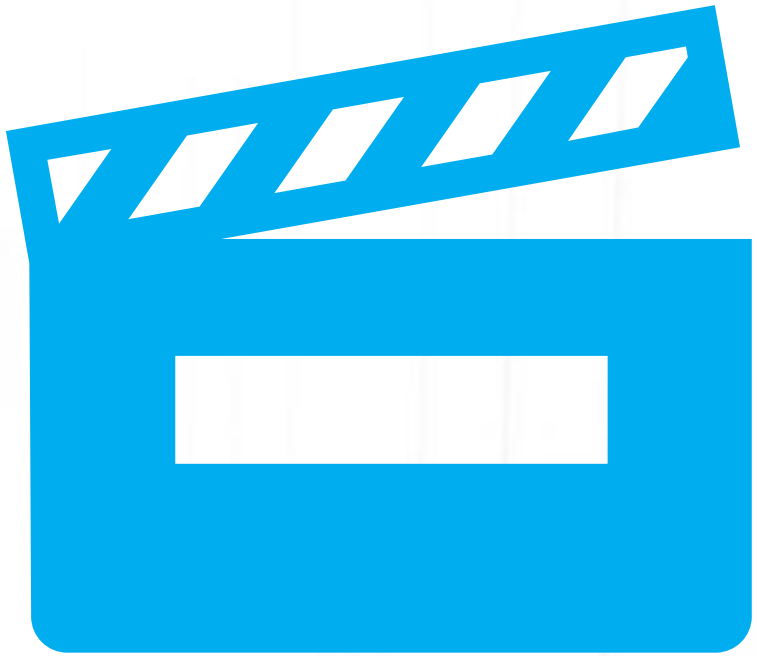
1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity—the art of maximising the amount of work not done—is essential.
11. The best architectures, requirements, and designs emerge from self-organising teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly.

Agile Manifesto: http://agilemanifesto.org/

Agile software development

Agile software development methods - videos

- Scrum
- XP
- Lean
- Kanban



Source: See UTS Online for the video links

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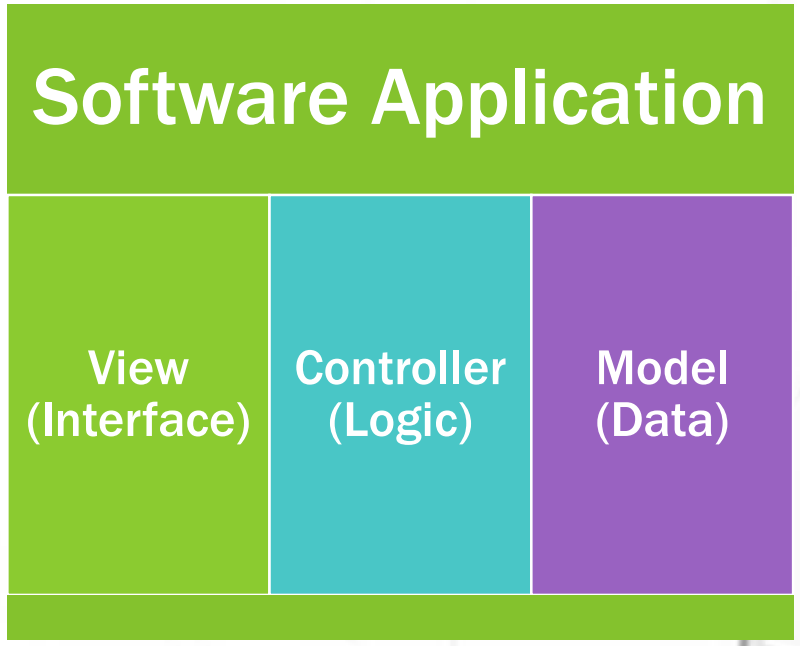
Software development project

Project stack



A simple application stack

Note: This subject will focus on developing a small software application.

Conclusion

- Individual vs professional software development
- Models and model driven software development
- Agile vs traditional software development
- Software development project and application stack