Software Engineering

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Agile Software Development

- **eXtreme Programming(XP)**
- **Scrum**

Rapid software development

- Rapid development and delivery is now often the most important requirement for software systems
  - Businesses operate in a fast –changing requirement and it is practically impossible to produce a set of stable software requirements
  - Software has to evolve quickly to reflect changing business needs.
- Rapid software development
  - **Specification, design and implementation are inter-leaved**
  - **System is developed as a series of versions with stakeholders involved in version evaluation**
  - **User interfaces are often developed using an IDE and graphical toolset.**

Agile methods

- Dissatisfaction with the overheads involved in software design methods of the 1980s and 1990s led to the creation of agile methods. These methods:
  - **Focus on the code rather than the design**
  - **Are based on an iterative approach to software development**
  - **Are intended to deliver working software quickly and evolve this quickly to meet changing requirements.**
- The aim of agile methods is to reduce overheads in the software process (e.g. by limiting documentation) and to be able to respond quickly to changing requirements without excessive rework.

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 principles of agile methods

Principle	Description
Customer involvement	Customers should be closely involved throughout the development process. Their role is provide and prioritize new system requirements and to evaluate the iterations of the system.
Incremental delivery	The software is developed in increments with the customer specifying the requirements to be included in each increment.
People not process	The skills of the development team should be recognized and exploited. Team members should be left to develop their own ways of working without prescriptive processes.
Embrace change	Expect the system requirements to change and so design the system to accommodate these changes.
Maintain simplicity	Focus on simplicity in both the software being developed and in the development process. Wherever possible, actively work to eliminate complexity from the system.

Agile method applicability

- Product development where a software company is developing a **small or medium-sized** product for sale.
- Custom system development within an organization, where there is a **clear commitment from the customer to become involved in the development process** and where there are not a lot of external rules and regulations that affect the software.
- Because of their focus on small, tightly-integrated teams, there are problems in scaling agile methods to large systems.

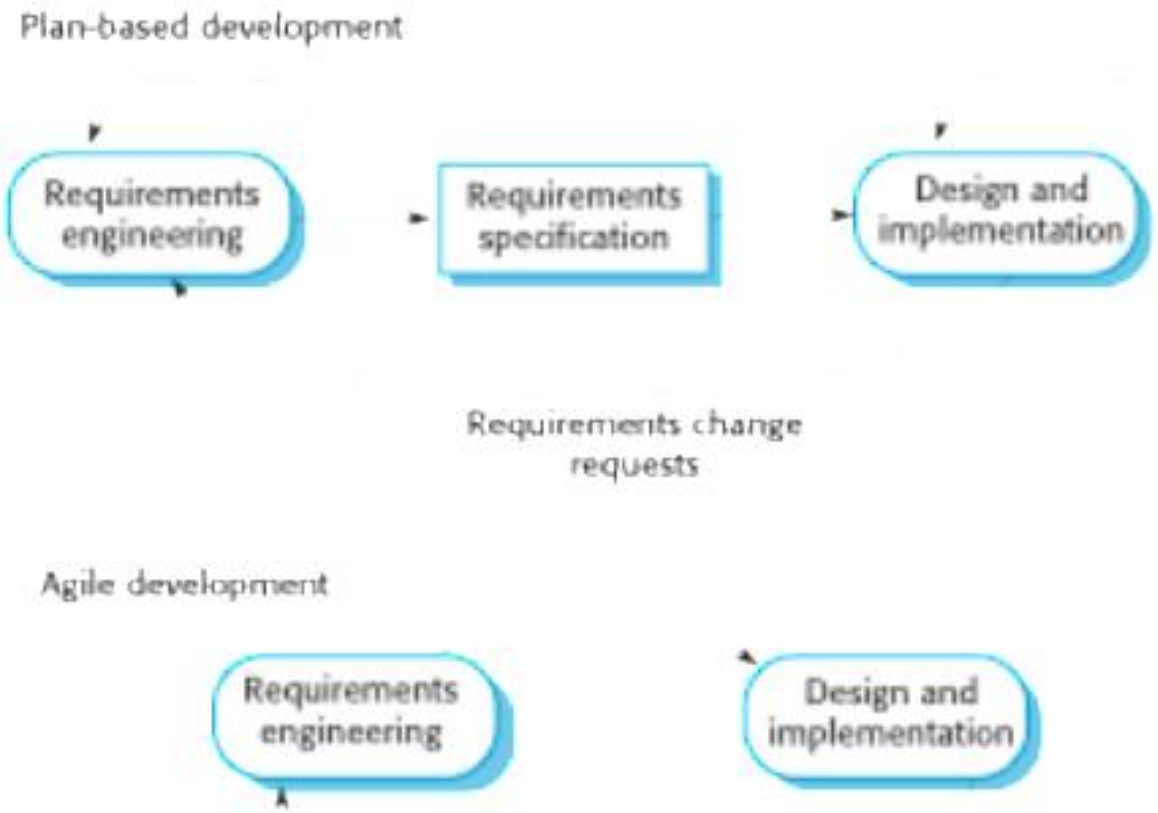
Problems with agile methods

- It can be difficult to keep the **interest of customers** who are involved in the process.
- Team members may be unsuited to the **intense involvement** that characterizes agile methods.
- **Prioritizing changes** can be difficult where there are multiple stakeholders.
- **Maintaining simplicity** requires extra work.
- **Contracts may be a problem** as with other approaches to iterative development.

Plan-driven and agile development

- **Plan-driven development**
  - A plan-driven approach to software engineering is based around separate development stages with the outputs to be produced at each of these stages planned in advance.
  - Not necessarily waterfall model – plan-driven, incremental development is possible
  - Iteration occurs within activities.
- **Agile development**
  - Specification, design, implementation and testing are inter-leaved and the outputs from the development process are decided through a process of negotiation during the software development process.

Plan-driven and agile specification



Agile Methods

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- **Scrum ?**

Thank You!