Lab 1 solution

1. Describe the process and characteristics of building a house following the waterfall way of working. Describe the advantages and disadvantages of building a house this way

   a. We first write down **all** requirements: number of rooms, doors, which carpet in which room, which light at what location, etc.
   b. Then we make a detailed design that contains all details of the house.
   c. Then we build it based on the design documents.
   d. When the whole house is completely ready, an inspector will inspect the house.
   e. Then the customer can see the house for the first time.

   A project manager oversees the whole project.

Advantage: simple to plan
Disadvantages : very inefficient for the builders, risks are found late, …

Characteristics of waterfall

Document driven	The customer is involved only at the beginning of the project
Risks are found late in the project	Lot of different roles
Requirements are frozen	Software can be used only at the end of the project
Throw artefacts over the wall	Not much possibilities for reflection and improvement
Project status is not clear	No feedback
No possibilities to learn other disciplines	There is no time left for testing

High risks, inefficient and static

Waterfall works good for the project manager, but not for the development team

2. Describe the process and characteristics of building a house following the RUP way of working. Describe the advantages and disadvantages of building a house this way

   a. We first write down an overview of the requirements in use cases.
   b. Then we have a number of iterations where we build a part of the house
   c. Let's say in the first iteration we build the kitchen:
      i. We make a detailed design of the kitchen.
      ii. Then we build the kitchen based on the design documents.
      iii. When the kitchen is ready, an inspector will inspect the kitchen.
      iv. Then the customer can see the kitchen.
   d. At the end of the iteration we find out how we can improve the next iteration
   e. Then we start the next iteration (maybe the living room)

   A project manager oversees the whole project.

   Advantages: faster feedback compared to waterfall, process improvement in every iteration,…
   Disadvantages : document driven, long iterations means late feedback, every team member still works on an island using documents,…
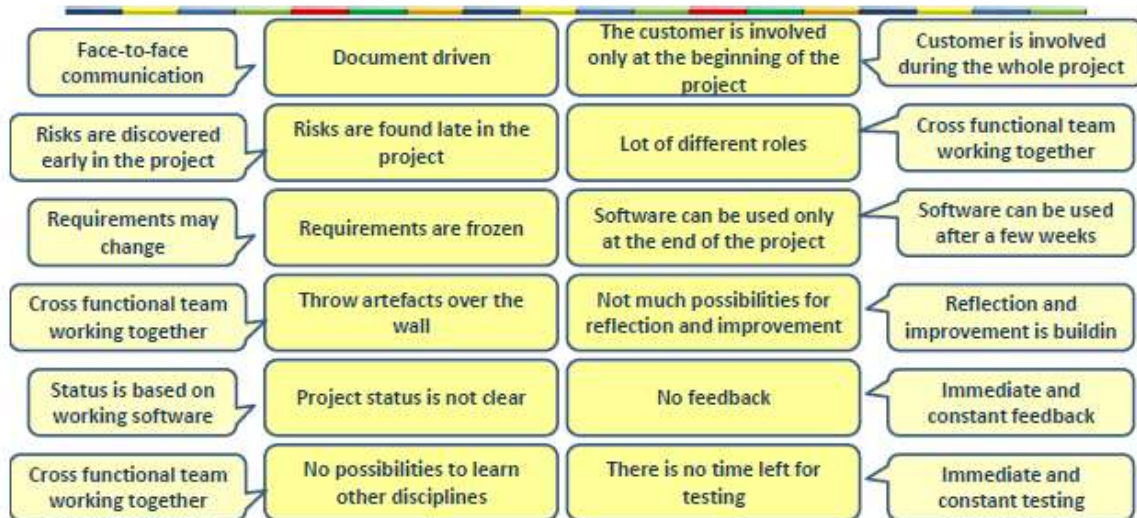
3. Describe the process and characteristics of building a house following the SCRUM way of working. Describe the advantages and disadvantages of building a house this way

   a. We first write down an overview of the requirements in user stories.
   b. Then we have a number of 2-week sprints where we build a part of the house
   c. Let's say in the first sprint we build a part of the kitchen:
      i. We make a list of user stories what we want to do this sprint.(sprint backlog)
      ii. Then we build the kitchen based on face-to-face communication.
      iii. When one user story is ready and is inspected by the inspector, the customer gets to see this user story.
   d. At the end of the sprint we show our work to the rest of the family that is going to live in the house.
   e. At the end of the sprint we find out how we can improve the next sprint
   f. Then we start the next sprint (other things in the kitchen)

   There is no project manager who oversees the whole project. The team takes care of this.

Advantages:

How is agile different?

Face-to-face communication	Document driven	The customer is involved only at the beginning of the project	Customer is involved during the whole project
Risks are discovered early in the project	Risks are found late in the project	Lot of different roles	Cross functional team working together
Requirements may change	Requirements are frozen	Software can be used only at the end of the project	Software can be used after a few weeks
Cross functional team working together	Throw artefacts over the wall	Not much possibilities for reflection and improvement	Reflection and improvement is buildin
Status is based on working software	Project status is not clear	No feedback	Immediate and constant feedback
Cross functional team working together	No possibilities to learn other disciplines	There is no time left for testing	Immediate and constant testing

Lower risks, efficient and dynamic

Agile works good for the development team

Disadvantage:

Agile/Scrum challenges

- The organizational culture needs to change
- Scaling scrum
- Scrum but
- Scrum does not solve all your problems
- The Product Owner role is difficult
- Scrum does not always fit

4. Describe how devops is different from other software development methods. What are the advantages and disadvantages of devops.

Devops is like scrum only with 2 main differences:

- Next to PO and developers we also have one or more operations person in our team.
- The team builds and maintains the application. A devops team stays together (as much as possible) during the lifetime of the application. The team members are experts in both the domain and in the technical understanding of the system.

5. What kind of projects can be best done using the waterfall way of working? What kind of projects can be best done using the RUP way of working? What kind of projects can be best done using the SCRUM way of working? What kind of projects can be best done using the devops way of working?

Waterfall: only simple projects with no uncertainty

RUP: only simple projects with a little bit of uncertainty

Scrum: good for building software in small sprints.

Devops: for systems where maintenance and support is important during the lifecycle of the system

6. What are the characteristics of documentation in a software project? How do you think we should document our software system: extended and detailed documentation or only small overview documents. What are the consequences or problems of your choice and how can we manage these problems?

Characteristics of documentation

- Takes a lot of time
- Developers are not good in writing documentation
- Documentation is not always kept up-to-date
- Large documents are not read

Agile documentation

What you always want

The application
The code
The tests
- Unit
- Integration
- Acceptance

The user manual

Overview of requirements
Overview of architecture
Decisions taken and why

Do you really need
more documentation?

- ?
- ?