IN5140 - Exam 2017

Exercise 2 (25%, ~4% each)

- Which types of waste (as defined in Lean) are you likely to encounter in Scrum?
- Define and describe the concept "technical debt”.
- Describe the concepts "feature team" and "composite team".
- Describe the concepts "standard process model" and "project process model”, and give an example of each of them.
- List and describe the four most popular agile meetings.
- Describe the concepts “Sprint” and “burndown chart”.

Which types of waste (as defined in Lean) are you likely to encounter in Scrum?

- Wishful thinking
  - Focusing on features and functionality which potentially can be useful in the future for customer ➔ can be regarded as non-added value, and therefore waste.
- Overengineering
  - Investing too much time into architecture and design of software product in the beginning is wasteful
- Unfinished work at the end of a sprint
  - Can cause team members to be idle
- Too much planning and documentation for a product which does not exist yet is also considered to be waste.

Define and describe the concept “Technical debt”

Technical debt is a term used to explain the phenomenon where you sacrifice long-term results for short-term results. It arises when you take shortcuts, or develop code in a lazy way to save a small amount of time, resulting in poor code quality that will lead to time wasted in the future. Technical debt can be "fixed" by refactoring the code base, to create better architecture, better design choices, more modular code etc.

Describe the concepts "Feature Team" and "Component Team"

Feature Teams:

- multi-purpose teams with multiple skill sets within the same team (multidisciplinary)
- Cross-functional and cross-component making end-to-end functionality
- Focus on value delivery

Component Teams:

- Have responsibility for a single component in a system
- Aggregate the needs of multiple features into the architecture for their component
- Focus on building the best possible, long-lived component for their area of responsibility.

Describe the concepts "standard process model" and "project process model”, and give an example of each of them.

Standard process models are the overall development process model that encapsulates the whole organization, such as the waterfall model. They involve every part of the organization, trying to model a process in which every team knows what they're supposed to do at every point during the process. So for example in the waterfall model requirements specification comes before design, which comes before development, which come before testing etc. This way of structuring the process should be the same across all teams working on the product, whether it is waterfall or agile.

Describe the concepts "standard process model" and "project process model”, and give an example of each of them.

Project process models are more low level and is more individual for each project and for each team (if we have autonomous self-managed teams such as Scrum teams). They tend to evolve during the project and from one project to the next, where the team focuses on continuous improvement in for example the Sprint retrospective in the case of Scrum, where the process is altered depending on what the team feels have to change. Projects and teams differ from each other, so different project process models will be made depending on the context.

List and describe the four most popular agile meetings

- Sprint planning
- Daily standup meeting
- Sprint review meeting
- Sprint retrospective meeting

Describe the concepts “Sprint” and “Burndown Chart”.

Sprint is used in Scrum to describe an iteration in development. Each sprint is time-boxed, usually 2 or 4 weeks long, where each Scrum team has a product backlog of items/tasks that are to be completely finished, tested and integrated by the end of the Sprint. The sprint has certain "ceremonies" (meetings) and the team consists of team members and the Scrum Master (in addition to an overall product owner that facilitates and prioritizes tasks for the backlog).

Describe the concepts “Sprint” and “Burndown Chart”.

A **Burndown Chart** is a visualization tool used to visualize which tasks have been completed, and which tasks work in progress (WIP). The chart implements a line that represents the "trend", showing how well (or bad) the team's progression is in accordance with where they should be in the schedule. Such visualization tools are helpful for the team to get an easy grasp on how they're doing, and can be a central part of, i.e. the daily standup meetings where the teams can see how they're doing, and discuss if necessary

Exercise 3 (20%)

Answer the following questions:

- Describe the difference between objective and subjective data.
- Describe the difference between quantitative and qualitative data.
- Give one example of each of the types objective, subjective, quantitative and qualitative data that you used or could have used in your compulsory project in IN5140.

Exercise 3 (20%)

Answer the following questions:

- **Describe the difference between objective and subjective data.**
- Describe the difference between quantitative and qualitative data.
- Give one example of each of the types objective, subjective, quantitative and qualitative data that you used or could have used in your compulsory project in IN5140.

Objective data vs subjective data

Objective data is data based on facts. Sources for objective data is empirical research such as experiments, and to some extent case study (although this one can be either subjective or objective depending on the data collected, as well as other biases that may be present).

Subjective data is data based on emotions and/or personal beliefs. Any other "data" that is not objective, is subjective. This means that research methods like surveys, interviews, field studies (depending on how the field study is performed) are sources for subjective data, even if the data is "honest" or in huge amounts, it will still remain subjective as long as it's not based on factual evidence.

Objective data vs subjective data

It is important to differentiate between these two, and use the two kinds of data only where they are appropriate. For example, people tend to quote subjective data as if it was fact. Here it is important to be aware of not just what the data says, but also the sources for the data. If you are doing software process improvement in your organization or project team and want to use data to support your changes, you have to be aware of what kind of data you are using.

Exercise 3 (20%)

Answer the following questions:

- Describe the difference between objective and subjective data.
- **Describe the difference between quantitative and qualitative data.**
- Give one example of each of the types objective, subjective, quantitative and qualitative data that you used or could have used in your compulsory project in IN5140.

Quantitative data vs qualitative data

Quantitative data is data that is quantifiable such as numbers.

Qualitative data is data that comes in text form, or other representations that are not quantifiable, but can be a lot more in-depth.

Quantitative data vs qualitative data

There is a common misconception that quantitative data is objective data, and that qualitative data is subjective data. This completely depends on what kind of data representation the data is in. Quantitative data is often found in research methods like surveys, where you can either answer to questions in numbers, or you can use Likert scales that can be translated to numeric values (very bad = 1, neutral = 3, very good = 5, etc.), whereas qualitative data often comes from interviews and discussions where the data can be a lot more in-depth. The quantitative data is a lot more limited in its representation, so it is important to get the kind of data that you need for your purpose.

Quantitative data vs qualitative data

If you want to know the opinion of many people then it makes sense to collect quantitative data, instead of qualitative data. Imagine going through thousands of replies that are all in text form, describing indepth the positives and negatives (qualitative data), compared to data saying that 1200 people think this, and 500 people think that (quantitative). Big amounts of qualitative data has its place though, for example in product reviews online, it is nice knowing what people who bought the product thinks of it more in-depth than a number ranging from 1-10.

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Give one example of each of the types objective, subjective, quantitative and qualitative data that you used or could have used in your compulsory project in IN5140.

No clear answer, will depend on your project.

Most important that you know the difference between the data types attributes while discussing.

Exercise 4 (35%)

a) **Document the process described above in a process model using BPMN.**

b) Propose improvements to the process described in the case description.

c) Describe three measures (variables) that the project could use to evaluate the effects of the changes in the development process that you proposed in (b).

Exercise 4 - Case description

A software company in Norway (Company X) is developing an administrative system for the Norwegian public sector (the customer). The current development process is as follows: Company X receives a fixed list of requirements from the customer. Company X then first rewrites the requirements into user stories and then groups them into a set of deliverables. For example, requirements that deal with profile administration are grouped into a deliverable entitled “User Profile”. After defining a deliverable, Company X sends it to the customer representatives for approval. Once the customer approves the deliverable, Company X sends the deliverable to a development team in Ireland that is owned by company X. The Irish team codes the requested functionality and sends back a demo to Company X. Company X and the customer assess in collaboration the work of the Irish development team. If the deliverable (demo) is accepted by the customer, Company X starts to plan a new deliverable. However, if the deliverable (demo) is rejected, Company X must ensure the necessary changes, including fixing bugs, performed by the Irish development team. After implementation, they return a new demo for approval. This cycle is repeated until the customer finally approves the deliverable.

Exercise 4 - Find organizations

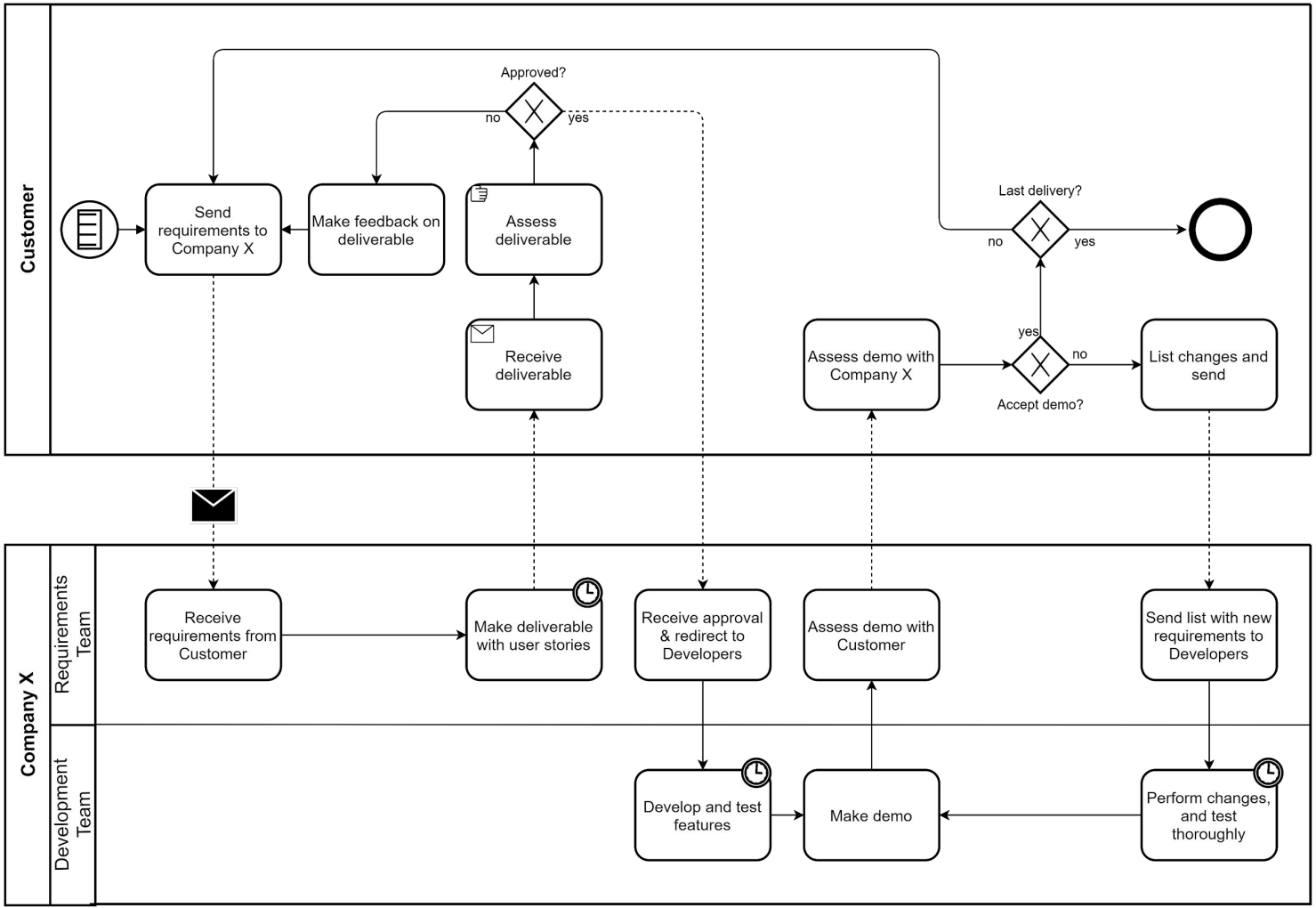
A software company in Norway **(Company X)** is developing an administrative system for the Norwegian public sector **(the customer)**. The current development process is as follows: Company X receives a fixed list of requirements from the customer. Company X then first rewrites the requirements into user stories and then groups them into a set of deliverables. For example, requirements that deal with profile administration are grouped into a deliverable entitled “User Profile”. After defining a deliverable, Company X sends it to the customer representatives for approval. Once the customer approves the deliverable, Company X sends the deliverable to a development team in Ireland that is owned by company X. The Irish team codes the requested functionality and sends back a demo to Company X. Company X and the customer assess in collaboration the work of the Irish development team. If the deliverable (demo) is accepted by the customer, Company X starts to plan a new deliverable. However, if the deliverable (demo) is rejected, Company X must ensure the necessary changes, including fixing bugs, performed by the Irish development team. After implementation, they return a new demo for approval. This cycle is repeated until the customer finally approves the deliverable.

Exercise 4 - Find actors within the organization

A software company in Norway (Company X) is developing an administrative system for the Norwegian public sector (the customer). The current development process is as follows: **Company X receives a fixed list of requirements** from the customer. Company X then first rewrites the requirements into user stories and then groups them into a set of deliverables. For example, requirements that deal with profile administration are grouped into a deliverable entitled “User Profile”. After defining a deliverable, Company X sends it to the **customer representatives** for approval. Once the customer approves the deliverable, Company X sends the deliverable to a **development team in Ireland** that is owned by company X. The Irish team codes the requested functionality and sends back a demo to Company X. Company X and the customer assess in collaboration the work of the Irish development team. If the deliverable (demo) is accepted by the customer, Company X starts to plan a new deliverable. However, if the deliverable (demo) is rejected, Company X must ensure the necessary changes, including fixing bugs, performed by the Irish development team. After implementation, they return a new demo for approval. This cycle is repeated until the customer finally approves the deliverable.

Exercise 4 - Figure out the current process

A software company in Norway (Company X) is developing an administrative system for the Norwegian public sector (the customer). The current development process is as follows: Company X receives a fixed list of requirements from the customer. Company X then first rewrites the requirements into user stories and then groups them into a set of deliverables. For example, requirements that deal with profile administration are grouped into a deliverable entitled “User Profile”. After defining a deliverable, Company X sends it to the customer representatives for approval. Once the customer approves the deliverable, Company X sends the deliverable to a development team in Ireland that is owned by company X. The Irish team codes the requested functionality and sends back a demo to Company X. Company X and the customer assess in collaboration the work of the Irish development team. If the deliverable (demo) is accepted by the customer, Company X starts to plan a new deliverable. However, if the deliverable (demo) is rejected, Company X must ensure the necessary changes, including fixing bugs, performed by the Irish development team. After implementation, they return a new demo for approval. This cycle is repeated until the customer finally approves the deliverable.


Customer
Approved?
no
yes
Send requirements to Company X
Make feedback on deliverable
Assess deliverable
Receive deliverable
Last delivery?
no
yes
Assess demo with Company X
yes
no
Accept demo?
List changes and send
Company X
Requirements Team
Development Team
Receive requirements from Customer
Make deliverable with user stories
Receive approval & redirect to Developers
Assess demo with Customer
Send list with new requirements to Developers
Develop and test features
Make demo
Perform changes, and test thoroughly

Exercise 4 (35%)

a) Document the process described above in a process model using BPMN.

b) Propose improvements to the process described in the case description.

c) Describe three measures (variables) that the project could use to evaluate the effects of the changes in the development process that you proposed in (b).

Propose improvements to the process described in the case description

I would start by letting the customer directly communicate with the development team in Ireland after the initial deliverable have been accepted. This will ensure that the exact information is delivered from the customer to the development team without any intermediary link.

Second of all, I would have a product owner be in constant contact with the actual development team in Ireland. Currently the development team creates the whole deliverable before it is assessed, which is a huge waste. Instead they should have a product owner either on-site in Ireland, or communicate through other means on a weekly or even daily basis to ensure that the development team is on the right track. This would remove any situation where the development team creates something that is not wanted by the customer, and it will reduce the overall time spent on useless/unwanted functionality.

Propose improvements to the process described in the case description

Separate actions will however have to be implemented if the development team continues to create bugs in the system, which is a sign of incapability or inexperience. It has to be fixed with other means such as an assessment of whether or not the some team members needs to be replaced, or if the development practices have to be changed. It is not stated in the case study what type of development process the team in Ireland uses, but I would suggest adopting a more agile process like Scrum, which would work swimmingly with my second suggestion of continuous communication with the product owner.

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Three measures used in project

- **Measure one:** Number of iterations needed for complete acceptance of a delivery.
- **Measure two:** Data about the overall time spent on each deliverable, averaged out over certain period of time can be compared to data before the process changes to see how the changes affected the average time per deliverable.
- **Measure three:** Data about the total number of bugs on average in a deliverable.

END Exam 2017