Name:	**Software Engineering**	**Topic**
Surname:	Homework 1, Solution	Software processes

Q1) What are the common phases of different software processes? Explain each of them briefly.

Altough plan-driven appoaches and agile approaches are different they both contain requirement specification, design, implementation, validation, and evolution phases.

Requirement specification → Investigation and analysis of the requirements of the software and constraints of the system. In waterfall output is SRS documents. In incremental (i.e. agile, or namely scrum), user stories an tasks.

Design → Software design is the process of envisioning and defining software solutions to one or more sets of problems. In waterfall output is design document. In incremental (i.e. agile, or namely scrum), code itself is thought as a design.

Implementation → Implementing the actual software based on the requirements specified and the design. In waterfall single release is produced. In incremental, several releases are produced in an incremental manners (i.e. agile, or namely scrum, each release is produced in each sprint)

Validation → Verification of the system by testing to see if it meets the needs of the customer. In waterfall, testing is realized for whole system using test document that is driven from requirement specification document. In incremental, test is done after each sprint.

Evolution → Modifying and maintaining the system (i.e. fixing bugs or issues) as new technologies are grown and new requirements are desired by the customer.

Q2) What are the major software processes branches? Explain each of them briefly. Name one software process for each branch.

Plan-driven Processes ⟶ They are the processes that are planned in detail by heavy documentation and the determined deliveries are done strictly in due date specified in the contract (i.e. Waterfall).

Incremental Processes ⟶ They are the processes that highly depends on individual interactions and customer cooperation, refuses heavy documentation and focuses on working software, and are highly adaptable to changes in the sector or changes wanted by the customer (i.e. Agile).

Integration and configuration ⟶ The system is assembled from existing configurable components

Q3) You have a friend whom works a software developer and he complains a lot about their software development process being to rigid and they need to develop to much documentation. Guess what software process this company is using.

They are probably using a plan-driven approach such as Waterfall model.

Q4) You work in Amazon as a software developer. Your company wants you to develop a novel product suggestion software for online shopping. In this tool, system will ask minimal number of questions to user and it will also show some product images to user and then system will suggest products for the customer based on the feedback of the customer. This is an in-house software development project. So put yourself into 3 different kind of software engineer person: (a) one who likes waterfall, (b) one who likes agile practices, (c) and one who likes to uses ready things. For these 3 approaches: give name of the process model, explain why it is suitable for this software-development project, state the disadvantages and the disadvantages (be an advocate and defend it, and be an prosecutor and try to show that this process model is not good). Finally, pick the best process model for this software development project and explain your reasonings.

a) Supporter: Waterfall model which is a plan-driven approach is suitable to this project because it is simple and easy to understand.

Opponent: It is not suitable because it needs the project to be immensely-documented, one phase must be completed strictly to go over the next one and the company has to wait until total completion of the product. Therefore, it prevents the system to withstand changes.

b) Supporter: Incremental development is suitable to this project because it is robust to changes that can be made during development of it; it facilitates delivery of a partially-completed working software so that a feedback can be provided by the company.
Opponent: Incremental development is not suitable to this project because management of the project is relatively harder with respect to a plan-driven approach.

c) Supporter: Amazon probably have similar software component at their repository. So, integration and configuration is suitable to this project because it enables faster development and delivery and risks are decreased since not all of the software is developed from beginning.
Opponent: Integration and configuration is not suitable to this project because it may not fit to the needs of the company and it is tough to make improvements on the ready-to-use components.

I think there is not much requirement for heavy documentation since this will be an in-house project and not a critical system project. Since customer analyses made on an online shopping are getting more realistic and powerful rapidly, I think the software should cope with the changes in analysis techniques and technologies. However, maybe several components that is less likely to change rapidly can be integrated from ready-to-use components. Therefore, I would use an approach that is a mixture of incremental development and integration and configuration.

Q5) Assume that you are using Agile approaches in your company (i.e. Scrum). And then you decide to improve the standard Scrum approach to make it more productive and fits better to your team and company to increase the capability of your company. What is the known name for this improvement of incremental (i.e. agile) process in the software engineering literature?

Process Improvement