EDA397 / DIT191 Agile Development Processes
Exam

Friday, April 17th, 2015

Examiner

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Allowed tools / material

None except pen/pencil and eraser

General information

Numbers within parentheses show the maximal points awarded for each question. Maximal points can be given if:

- The answer is correct and correctly motivated.
- The presentation of the answer is readable and clear.
- The answer is given in <u>English.</u>

One sheet of paper may only contain parts of solutions belonging to one question.

Grading

The grades on this exam are based on your total score on the questions. For Chalmers students:

0 – 29 points:	Fail
30 – 38 points:	3
39 – 47 points:	4
48 – 60 points:	5

For GU students:

0 – 29 points:	Fail
30 – 47 points:	G (Pass)
48 – 60 points:	VG (Pass with distinction)

Results

Exam results will be made available through Ladok.

Review

The exam review will take place from 3pm – 4pm on 20-May-2015, House Jupiter, Room J473

The Agile Manifesto states the following **fundamental 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

These values are complemented by the following core **principles**:

1. Early and continuous delivery of valuable software
2. Welcome changing requirements, even late
3. Deliver working software frequently
4. Business people and developers must work together
5. Build projects around motivated individuals
6. Face-to-face communication is most effective and efficient
7. Working software is the primary measure of progress
8. Sustainable development
9. Continuous attention to technical excellence and good design
10. Simplicity is essential
11. Self-organizing teams
12. Regular reflection

General hint: Please be concise in your answers and make sure that you answer the question. Keep in mind that we always require you to motivate your answer and to demonstrate a good understanding of the subject matter. Points will be given for a) correctness of your answer, b) soundness of your argumentation, and c) general demonstration of knowledge.

Task 1: Agile Principles (12p)

Based on the fundamental values of the agile manifesto, take a position and discuss the following statements about disadvantages of agile or traditional, plan-driven software development. Note that the statements might be wrong.

a) "In comparison to plan-driven development, agile development wastes resources through constant change and rework." **(3p)**

b) "In comparison to plan-driven development, the lack of documentation in agile development will lead to severe problems in the software maintenance phase." **(3p)**

c) "In comparison to agile development, the focus on contracts in plan-driven development reduces the risk of failure but also the chance to win." **(3p)**

d) "In comparison to agile development, plan-driven development is more likely to satisfy the customer by delivering the software the customer has ordered according to agreed contracts and plans." **(3p)**

Task 2: Agile Principles (10p)

Suppose you are to create an agile team to work on a web based information system with strong focus on User Interface. Which of the following roles would you include in the team and which roles would you on outside the team? Give a **short** statement (1-2 sentences) of what the role would be doing inside or outside the team and a **short** statement (1-2 sentences) to motivate your decision.

a) Software Tester (testing knowledge, incl. Unit and Integration Tests) **(2p)**
b) Software Architect (architectural knowledge and vision for future architecture) **(2p)**
c) User Experience Specialist (expert in enhancing user satisfaction during interaction between user and product: usability, ease of use, pleasure) **(2p)**
d) Business Intelligence Specialist (expert in transforming raw data into meaningful and useful information for making business decisions) **(2p)**
e) Database Expert (expert in designing, managing, and using databases) **(2p)**

Task 3: Lean vs. agile (12p)

Lean Software Development advocates perceiving software development as a manufacturing process.

a) Discuss, how the manufacturing process metaphor can be applied to software engineering, i.e. to identify waste, streamline the value chain, produce on request (just-in-time). Give specific examples. **(6p)**
b) Give an example of a software development scenario that is suitable for lean software development and one example that is more suitable for agile software development (e.g. XP or Scrum). Discuss similarities and differences between agile software development and lean software development. **(6p)**

Task 4: People-centric development (12p)

Steve Jobs famously said, *"A small team of A-plus players can run circles around a giant team of B and C players."* By this he suggests to hire the best developers, even at a high cost. Assume you are in a situation where you need to develop software with the players that are currently available.

a) Discuss why doubling the amount of developers does not double the development capacity. **(6p)**
b) Discuss what kind of development process you would recommend for the small team with excellent developers and what kind of development process you would recommend for the large team with average developers. **(6p)**

Task 5: Communication and Feedback in Agile (8p)

Agile methods focus on face-to-face communication and feedback. Discuss:

a) Discuss two advantages and two disadvantages of relying mainly on face-to-face communication? **(4p)**

b) Consider a distributed agile team (where some team members are located in different cities, time zones, or even continents). Revisiting your answers to Task 5.a: To what extend can the advantages be leveraged / the disadvantages be mitigated in distributed agile projects? **(4p)**

Task 6: Automated Testing in an Agile Environment (6p)

For each of the test related statements below, state if the statement is true or false and write a **brief** motivation (1-3 sentences) why such is the case. Hence, if the statement is true you should discuss why it is true in the described context. However, if the statement is false you should describe why such is the case and what to change to make it true.

a) Automated unit test cases can replace manual test cases for individual software components as well as GUI components **(1p).**

b) Unit tests are required for test first to be applicable for regression testing of evolving software **(1p).**

c) Regression testing is a practice performed after a change request from a customer has been implemented to ensure that the previously developed system still works **(1p).**

d) Visual GUI Testing test cases can be developed from the very start of a new project for automated GUI based regression testing **(1p).**

e) A company with automated test cases for component, integration, system and acceptance testing does not have to do any manual testing **(1p).**

f) Automated test cases are cheaper to execute than manual test cases but automated testing is generally equally, or more expensive, in the long run than manual testing **(1p).**