DIT045 / DAT355 Requirements and User Experience
Final Exam

Aug 19, 2021, 14:00

Examiner/Contact Person
Jennifer Horkoff: jenho@chalmers.se / contact via Canvas
Email / message Jennifer via Canvas. She will check email at 14:30, 16:00, 17:30

Authorized Aids

- Textbook: Designing Interfaces, 2nd or 3rd Edition, Patterns for Effective Interaction Design, By Jenifer Tidwell
- Course slides and assignments.

Note: you have an open book exam and can access the internet but accessing random examples or information on the web is not recommended. You may find examples or advice which differs from course material.

Note: although the exam is open book, you are not allowed to collaborate with each other when creating answers. Any written or drawn answer which is very similar to another will be reported for plagiarism.

See announcement for detailed information on how to prepare and submit your file:
https://chalmers.instructure.com/courses/16641/discussion_topics/69559

GU Grading Scale for Exams

% Grade	GU Grading Scale
0-49%	Fail (U)
50-75%	Pass (G)
76-100%	Pass with Distinction (VG)

Chalmers Grading Scale for Exams

% Grade	Chalmers Grading Scale
0-49%	Fail
50-64%	3
65-79%	4
80-100%	5

PLEASE OBSERVE THE FOLLOWING:

- All answers must be in English. Answers must be legible and readable.
- Sort the questions in order before handing them in.
- Put the number of the question on every paper.

Part 1: Multiple Choice and Short-Answer Questions

Question 1: Multiple Choice Questions (11 points)

On your paper, write the name of the question, then the letter(s) of your chosen answer(s), e.g., 1.1: c., 1.3: a, d, e. For each question, there may be more than one correct answer. For full marks, list all the correct answers. Each correct answer listed is +1 point, each incorrect answer is -1 point.

1.1 Which of these requirements captures design information and are therefore not well-formed requirements? In this question there may be more than one answer, list them all.

a) The system will use a payment gateway which connects to a merchant account
b) The system will allow users to rent a bicycle
c) The bike will not be unlocked until the payment transaction has completed successfully
d) The system will implement an event-based architecture to satisfy rental demands
e) The system will include a lock sensor to detect the presence of bikes
f) The system should support payment by common credit and debit cards

1.2 Which of the following definitions is correct? One or more may be correct.

a) Exploratory creativity involves shifting the idea space (e.g., by questioning assumptions), leading to a new space of ideas
b) Convergent creativity involves coming up with many new ideas
c) Exploratory creativity involves finding new ideas within the same space
d) Divergent creativity involves taking existing ideas and converging to an agreed upon set of new ideas
e) Combinatorial creativity involves finding new ideas by examining the combination of existing ideas

1.3 Which descriptions of experimental terminology are correct? There may be more than one correct answer.

a) The independent variable is the influencing factor you are changing in order to see if it has an effect to the independent variable.
b) The independent variable is the response/effect you are observing to see if it should be attributed to the dependent variable.
c) Confounding factors are other influencing factors that, if left uncontrolled, won't let you prove the connection.
d) The dependent variable is the response/effect you are wondering if it should be attributed to the independent variable

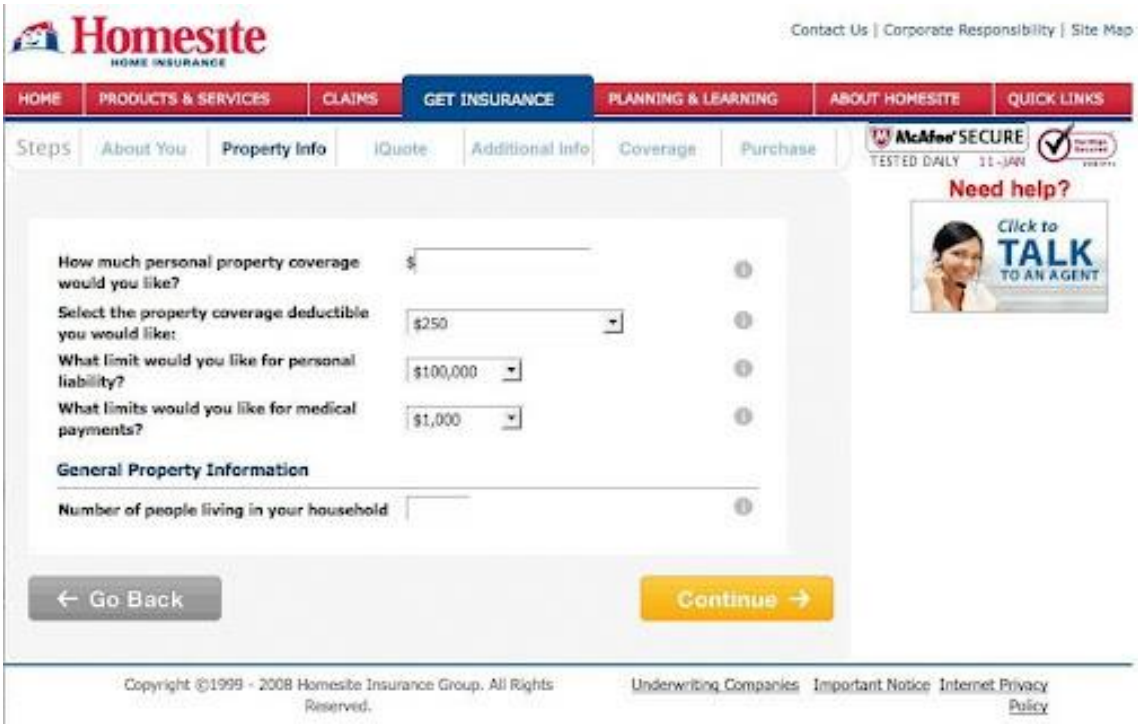
1.4 Which of the following statements is correct? One or more may be correct.

a) Domain properties are requirements, they are requirements that come from the domain.
b) Domain properties are not requirements, they do not have to be satisfied by the system.
c) Users are stakeholders, not all stakeholders are users.
d) Stakeholders are users, not all users are stakeholders.
e) Constraints are not requirements, they are properties of the domain.
f) Constraints are requirements, they are requirements that do not come from user needs.

Question 2: Short-Answer Questions (14 marks)

2.1 Modeling (e.g., context diagrams, use case diagrams, goals models) is used more often as part of requirements engineering (RE) compare to user experience (UX) design. One exception is customer journey maps, which comes from the world of UX. Why are models like context diagrams, use case and goal models more typically used for RE than UX? Think of the types of models we have used in the course and what they contain. Why are customer journey maps often used in UX? (4 marks)

2.2 Name three design patterns appearing in the following UI. What is each of the three patterns used for/what are the benefits of the pattern in this example? (6 marks)



2.3 What is wrong with the following SRS requirements? Keeping in mind the desired qualities of requirements, list 4 quality issues found in the requirements below. (4 marks)

1. A system interface for both first- and second-year courses should be created
2. The interface described in requirement 1 should have a login button and should allow users to select a language
3. The system must facilitate multiple Markers marking the same assignment
4. Markers should be able to see what marking they have been assigned
5. Markers should be happy with their experience using the system
6. Markers should be able to see which assignments they have been assigned, but that have not been marked yet

Part 2: Domain Example and Long-Answer Questions

The remaining questions on the exam will relate to a problem in a case, as described below. The scenario describes the situation today and the expectations for the new system. Focus your analysis and modeling on the envisioned (to be) system, but keep in mind the problems with the way of working, trying to avoid some of the issues reported.

Employee Education

Many companies need to manage training and courses for their employees. Various systems are available to support this. Imagine that you work for the supplier of such a system. Your job is to perform requirements analysis and (some) UX design for a new system for planning and recording of courses taken by individual employees for a particular company, X.

The situation today
The current system for company X was abandoned because the system provided a poor overview and was hard to use. As a result, the manager had to plan which employees needed which course and enroll them. The manager maintains a list of all the employees. The list shows the courses taken by the employees and when they were taken. It is hard to get an overview, of course, particularly if there are more than 50 employees. It is also hard to see who needs a course in the near future.

When an employee has taken a course, the manager has to record it. They easily forget. Or they erroneously record that the employee has completed the course, when in fact the employee stayed at home because of illness.

Vision (system to be)
Around every two weeks, the manager plans whom to enroll on the next courses. For this purpose, it must be possible to see who needs the course in the near future. It would also be nice to see the courses offered in the near future to make it easier to distribute the employees over the period. In order to check that an employee has the necessary preconditions, it must be possible to see which courses the employee has completed already.

The manager must be able to record in the system which employees to enroll in which courses in the near future. Employees can be enrolled for courses by both themselves and managers, but when enrolling themselves, the enrollment must be approved by a manager before the course is taken. The employees can get information about their final enrollment in the system.

Company X has a training department which organizes, hosts, and records who has completed the courses. The training department announces the courses in the company news and online so that employees see them and can enroll.

Company X has a finance department who keeps track of internal costs. The finance division must also know how many employees took what courses and when, and how much money it takes to put on a course. The finance division creates yearly reports for managers which describe total training costs for his/her employees. They also advise on which courses are not economically viable, e.g., those which are expensive and/or who have few enrollments.

The system should protect the privacy of employees in that other employees, except the managers and training department, can't see who has taken what course.

The new system should be available by the end of 2022. It must work on the computers currently available in the company.

Question 3: Context Diagram (10 points)

For the case, draw a context diagram. Add the system actor, identify the relevant stakeholder/actor entities, and the relationships between the system and these entities, labelled with high-level inputs and outputs. Try to capture 5 actors, and appropriate flows. Supplement the diagram with text to explain any ambiguous or unclear parts of the model.

Question 4: Use Case Diagram (10 points)

For the case, draw a use case diagram. Capture the system and other relevant stakeholders. Identify the major use cases and relationships, both between the stakeholders and the use cases, and, if relevant, between use cases. Try to capture 4 actors, and appropriate use cases. It's helpful to use the information already captured in the other diagrams; however, we won't mark you on consistency between diagrams. Supplement the diagram with text to explain any ambiguous or unclear parts of the model.

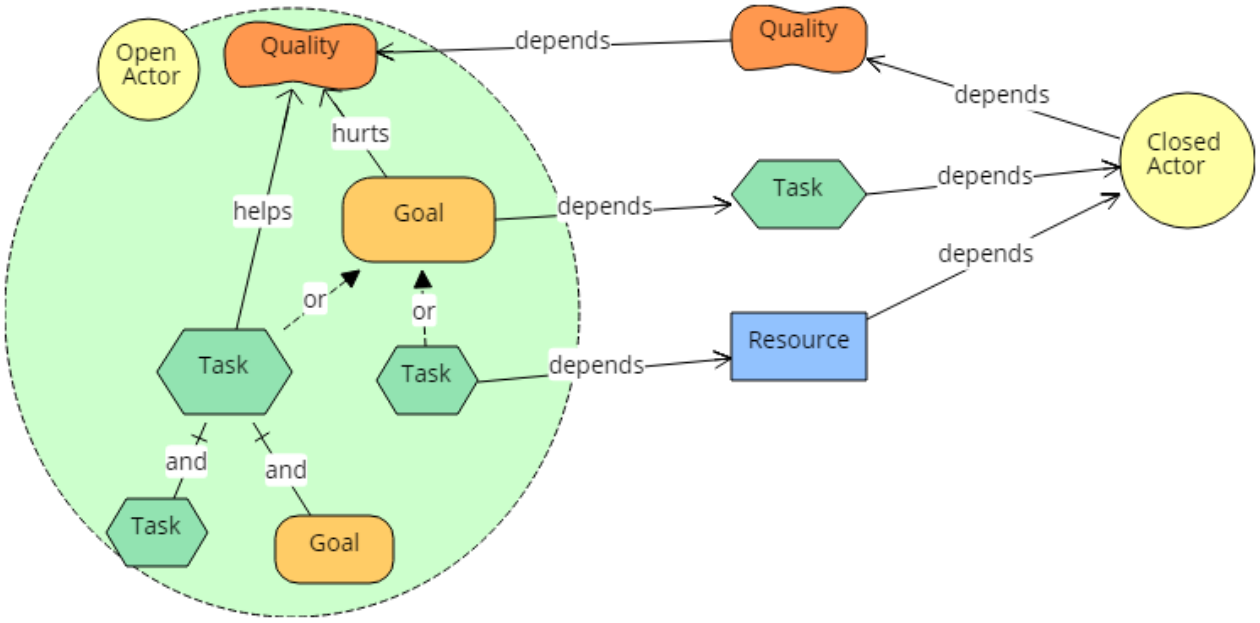
Question 5: Goal Model (15 points)

For the given case, draw a goal model. Identify the relevant actors, including the system actor. Try to capture four actors, and important dependencies between actors. Show the internal goals/tasks/resources/qualities for at least one actor, the others can be "closed" showing only dependencies to and from the actors. See the legend below for open and closed actors. For the open actor, capture the desired goals, tasks, resources, and qualities. Add some internal relationships between these elements.

There are many elements that can be included in the model. Aim for: 4-5 actors including one open actor with an actor boundary, at least one goal, quality, resource, task, four dependency links, two contribution links and two AND/OR links. In other words, the model does not have to be complete as per the case description.

It's helpful to use the information already captured in the other diagrams; however, we won't mark you on consistency between diagrams. Supplement the diagram with text to explain any ambiguous or unclear parts of the model.

Goal Model Legend (note, can use alternative shapes and labels as long as the mapping to the original concepts is clear).



Question 6: Textual Requirements (15 points)

Record requirements for the case. List four functional requirements in SRS form, two non-functional requirements in SRS form, two domain assumption in SRS form, and two constraints in SRS form. In addition, list five user stories. The user stories should be unique, i.e. not a repeat of one of the SRS requirements. Remember the desired characteristics of user stories and SRS requirements when recording your requirements.

Question 7: UI Design & Patterns (20 points)

Draw two UI screens for the domain solution. Screens can include pop-up windows, just be clear how and why they appear. Each screen should use at least two different patterns from the Tidwell book, four different patterns in total. Each screen should implement at least two functional requirements. For each screen write: the two requirements implemented (and how, if not obvious), the two patterns implemented, and why the patterns are a good choice for the screen and its functions.

Question 8: User Testing Tasks (5 points)

Come up with a list of five test tasks for the users to perform during usability tests for the two designed screens. Each screen should be used in at least one task. The tasks should cover some of the main use cases or requirements of your system which are implemented in the two screens. Tasks should conform to the desirable qualities of user test tasks as discussed in the lecture.