DIT046 / DAT356 Requirements and User Experience
Final Exam

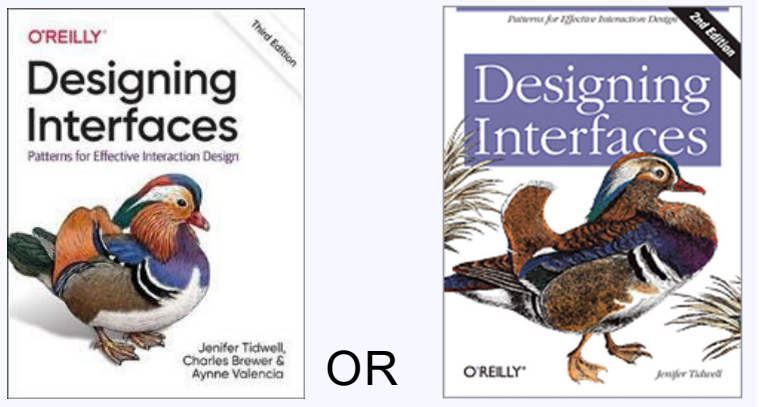
January 12, 2022

Examiner/Contact Person

Jennifer Horkoff
Jennifer will come to the room to check for questions roughly every hour.
Alternatively Phone: 0733 050517

Authorized Aids

Textbook: Designing Interfaces, 2nd or 3rd Edition, By Jenifer Tidwell (Charles Brewer & Aynne Valencia)



Grading Scale for Exams

% Grade	Final Grade
0-49	Fail (U)
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.
- This exam has 7 pages.

Part 1: Multiple item and Short-Answer Questions

Question 1: Multiple Choice Questions (15 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. Which of these requirements captures design information and is therefore not well-formed? Note that these are intended to be requirements from users, not constraints on the design. The requirements are about an application which must show and process files created by another tool. In this question there may be more than one correct answer, list them all.

   (a) The user should be provided with facilities to define the type of external files, i.e., to associate tools with files

   (b) Each external file type may be represented as a specific icon on the user's display

   (c) The icons used for external files must use a shade of blue

   (d) When a user select an icon representing an external file, they system shall display the warning "Opening file with external tool" in a pop-up message with options "OK" and "Cancel".

   (e) The software must provide a means of representing and accessing external files created by other tools

   (f) The icons and tool associations will be stored in a MySQL database

2. Which activities are part of the feedback loop according to the Lean Startup? One or more answers may be correct.

   (a) Requirements Analysis

   (b) Development

   (c) Build

   (d) Product

   (e) Test

   (f) Measure

3. Which of the following statements about desired qualities of SRS requirements and user stories are true? There may be more than one correct answer.

   (a) User stories should be small, consistent, and testable

   (b) User stories should be valuable, independent, and negotiable

   (c) User stories should be unambiguous, testable, and valuable

   (d) SRS requirements should be feasible, necessary and complete

   (e) SRS requirements should be implementation free, be small, and feasible

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

   (a) Exploratory creativity involves finding new ideas within the same space

   (b) Convergent creativity involves taking existing ideas and converging to an agreed upon set of new ideas

   (c) Exploratory creativity involves shifting the idea space (e.g., by questioning assumptions), leading to a new space of ideas

   (d) Convergent creativity involves finding new ideas within the same space

   (e) Transformational creativity involves taking existing ideas and converging to an agreed upon set of new ideas

   (f) Combinatorial creativity involves finding new ideas by examining the combination of existing ideas

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

   (a) Dependent variable is the influencing factor you are tweaking in order to see if it has an effect on the independent variable.

   (b) Dependent variable is the response/effect you are observing to see if it should be attributed to the independent variable.

   (c) Confounding factors are other influencing factors that, if left uncontrolled, won't let you prove the connection between variables.

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

   (a) Users are stakeholders, not all stakeholders are users.

   (b) Stakeholders are users, not all users are stakeholders.

   (c) Constraints are not requirements, they are properties of the domain.

   (d) Constraints are requirements, they are requirements that do not come from user needs.

   (e) Domain properties are requirements, they are requirements that come from the domain.

Question 2: Short-Answer Questions (15 points)

1. In requirements engineering, we often must scope the problem we are addressing. Why is this important? List two reasons. (2 points)

2. Name two methods to prioritize requirements as described in the course lectures. Describe briefly how they work. (4 marks)

3. Name the four types of metrics for measuring the usability of a system covered in the lectures. (4 marks)

4. In his book "the Design of Everyday Things", Norman describes seven fundamental principles of design. List and briefly describe two of them. (4 marks)

5. What is a blue ocean strategy? (1 mark)

Part 2: Domain Example and Long-Answer Questions

The remaining questions on the exam will relate to a problem in a domain, 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 and requests with the as is situation, trying to avoid problems and satisfy user needs.

As is Situation: Item Purchasing

Many employees must purchase supplies and equipment as part of their jobs (e.g., paper, electronics, office furniture). Employees need a way to have these purchases approved and reimbursed. Imagine that you are performing requirements analysis for a system for item purchasing and reimbursement.

When an employee plans to buy an item, they first get a quote or determine how much the item(s) will cost. Employees must get approval for buying the item from a manager when the item costs more than 1,000 SEK. To do this the employee sends the costs and a short description of the item and what it is needed for to the manager. Managers look at the importance of the item and check that it is within the company budget. The manager would like to see how much the employee spent on items recently, but usually it is hard to find this data.

When the employee has bought the item(s), he/she collects the receipt(s) and writes a reimbursement statement. Currently, the employee fills out a form, prints it out, signs it, and sends it with internal physical mail. This is tedious, and sometimes forms get lost.

When the manager receives the form, they would like to compare the statement with the budget to check that deviations are reasonable (e.g., the employee said the item was 1,500 SEK, but it's actually 3,000 SEK). If the manager cannot accept the reimbursement claim, the employee gets it back with a note on what is wrong. If everything is okay, the manager passes it on to accounting that ensures that the amount is transferred to the employees bank account. This process takes time and can often get stuck somewhere.

Desired to be Situation

With the new IT-based system for item purchase reimbursement, employees create a purchase budget for one or more items over 1,000 SEK and later make a purchase reimbursement statement. Budgets and statements are electronically passed on for approval and finally payment in the accounting department.

The system knows which manager can approve a specific purchase. It sends an email to the correct manager. When the manager gets the email, they must use the new system to see details of the purchase. It is expected that managers have so many purchases to deal with that they cannot keep track of them as emails. For this reason, the system should provide the necessary overview of the purchases.

In case the purchase isn't approved, the manager sends an explanation through the system to the employee. The employee must then make the necessary changes through the system.

The purchaser employee must always be able to see the current status of their requests. They receive email notifications of status changes. Notice that a employee may have several reimbursement claims in progress at the same time. When submitting the reimbursement statement, the purchaser must upload receipts in the system (PDFs or scans). The budget and reimbursement approvals should be relatively fast, no more than three days each.

The system must be ready by July 2023. The software can work on a computer or a phone, using versions of Apple, Windows or Android within the last 3 years.

Question 3: Context Diagram (10 points)

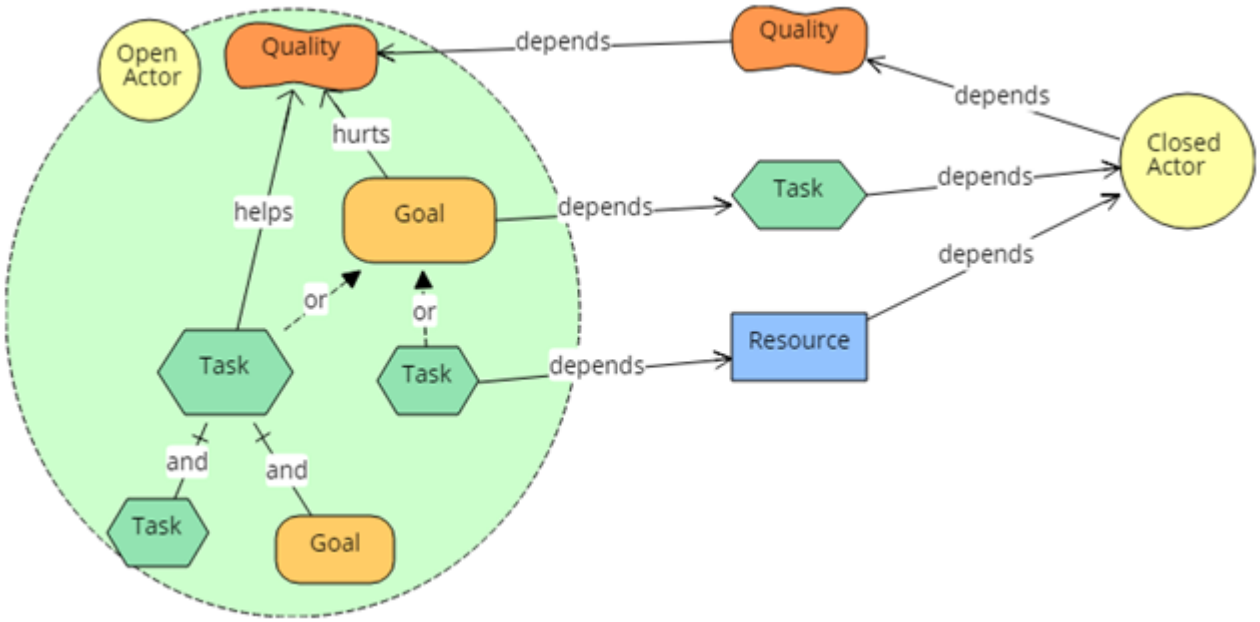
For the given case, draw a context diagram. Add the system actor, identify the relevant stakeholder/actor entities, and the relationships between the system and these entities, labelled with high-level inputs and outputs. Try to capture at least four actors, and appropriate relationships. Supplement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

Question 4: Goal Model (10 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: four 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 domain 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 5: Customer Journey Map (10 points)

Draw a customer journey map for the given case. Indicate who is your customer. Think about the channels and touchpoints that she would have to go through when using the system. Try to include three channels and at least five touchpoints.

Question 6: Textual Requirements (15 points)

Record requirements for the case provided. List four functional requirements in SRS form, two non-functional requirements in SRS form, two domain assumptions, and two constraints. 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 given case implementation. Screens can include pop-up windows, just be clear how and why they appear. Each screen should use at least two different patterns from either Tidwell book, four different patterns in total. Each screen should implement at least two functional requirements (they do not have to be the requirements from question 6, just make it clear what requirements the screens implement). 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 tested by at least one task, for at least two tasks, indicate which of your two screens they test. The tasks should cover some of the main use cases or requirements of your system. Tasks should conform to the desirable qualities of user test tasks as discussed in the lecture.