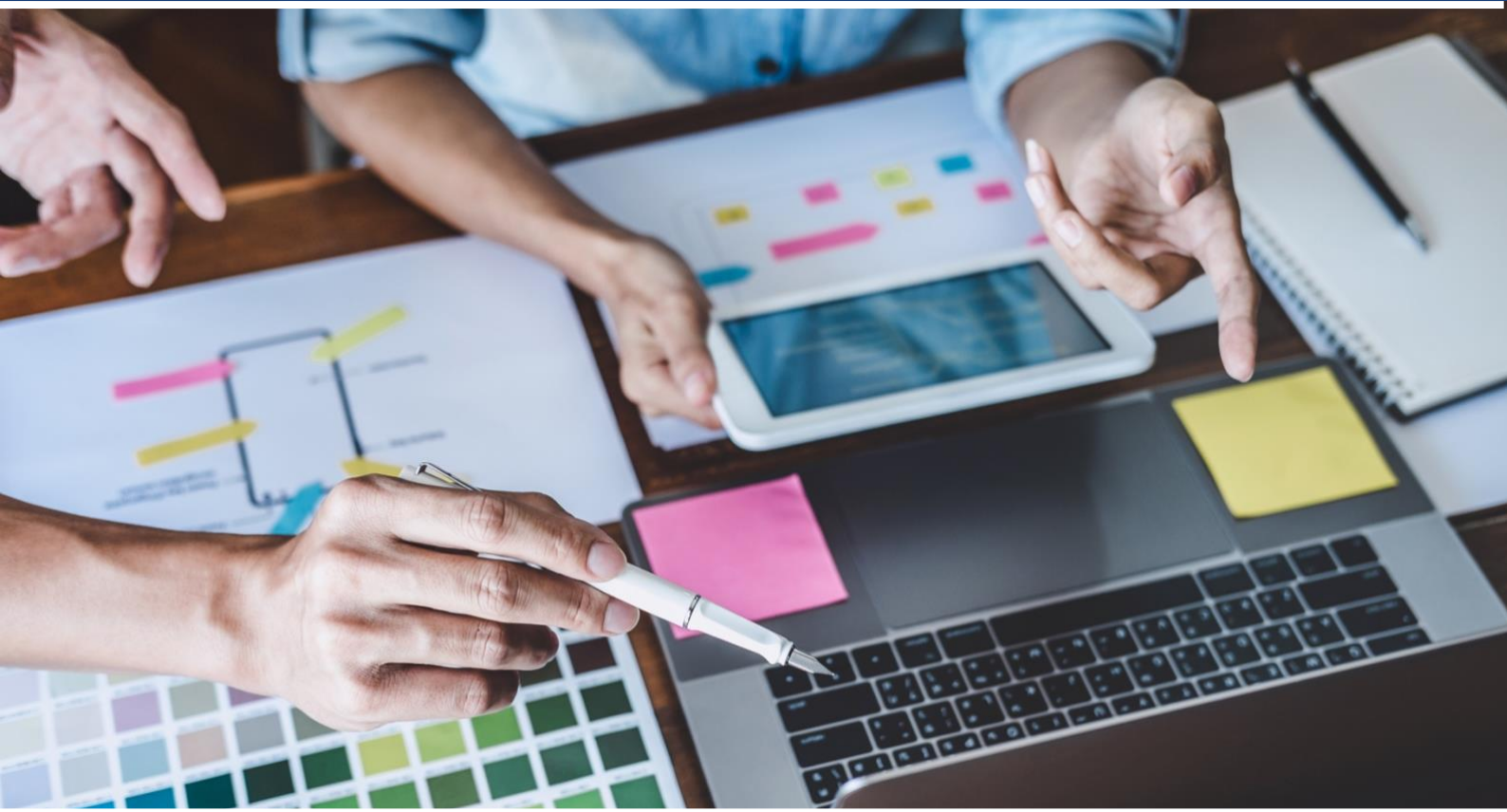# IFN552: Systems Analysis and Design Assessment Task 1 – Requirements Analysis, Use Case and Activity Diagram

Assessment Task 1 – Individual
Task overview

Assessment name:	Requirements Analysis, Use Case and Activity Diagram
Task description:	In this Assignment, you will take what you have learnt in weeks 1, 2 and 3 and apply this to a case. You will develop a list of questions that you would ask key stakeholders to elicit requirements, distil stakeholder needs into functional requirements in a **Requirements Matrix**, draw a **Use Case Diagram** and **Activity Diagram**. You will also justify your designs in short descriptions accompanying each of these outputs.
Learning outcomes measured:	This assignment will assess your understanding of the material taught in weeks 1, 2 & 3, your ability to apply what you have learnt to a particular business case, and communicate effectively through your written and diagrammatic outputs (i.e. the matrix, diagrams and their accompanying descriptions). The skills you will develop as part of this process will be useful when you move forward into your careers.
Due date:	Friday, 19th August 2022
Weighting:	50%
Individual/Group:	Individual
Authentic Assessment:	☒ Yes ☐ No
Formative/Summative:	Summative
How will I be assessed:	7-point grading scale using a rubric

Task details

What you need to do:	1. Read the Criterion-Referenced Assessment Rubric at the end of this document. 2. Read Case 1 (below) which pertains to all elements of this assignment. 3. Develop and document a **list of questions** for two of the key stakeholders to specifically gather _functional requirements_. Aim for approximately **10 key questions for each stakeholder** type (you can also choose to add follow-up sub-questions if necessary). 4. Try out your questions on the _Grower, Customer_ and _Business_ chatbots (available by the end of Week 1) on Slack by entering a conversation with each under the "Apps" dropdown in the IFN552 Slack channel. _Note the chatbots are there to provide you with an opportunity to practice asking stakeholder questions and to provide additional 'bonus' information about the case; they will not be able to answer all of your questions, but can help you explore and_

*brainstorm some of the needs for the stakeholders. **Please <u>do not</u> rely solely on these to develop your list of requirements***.

5. Develop a **Requirements Matrix** to show the functional requirements of the new system. ***Aim for:***

   a) ***15 Essential*** Functional Requirements

   b) ***5 Desirable*** Functional Requirements

   c) ***1 Optional*** Functional Requirement

   You should include the suggested number for each priority of requirements, totalling around 21 Functional Requirements in your matrix. A small amount less or more may be ok depending on the quality of the ones you include, but you will need to stay around the number stated above. Whilst each will have certain priority, and the list may not be comprehensive, you need to ensure that *all are relevant* to the case and are **concise**, **specific**, **measurable** and **actionable**.

6. In <u>250 words or less</u>, **justify your choices** (i.e. How/why did you decide to split the system into the modules you chose? How did you decide on priorities? Is there a particularly novel or unusual requirement that you have identified – if so, how does it meet the needs of your stakeholders? etc.).

7. Draw <u>1 (one)</u> **Use Case Diagram** representing the new integrated system described in the case.

   a) Aim to include around **15-20 Use Cases** in your diagram (no more than 23). Ensure that the use cases you do include are *important* and *relevant* to the process being represented.

8. In <u>250 words or less</u> also **introduce** your use case diagram (i.e. what is it describing? At which points do users interface with the system? What is outside the scope of your diagram? Etc.).

9. Draw an **Activity Diagram**, representing how a grower would order a kit on the website, monitor the growth of their produce, organize a swap for their grown produce with replenishment seeds/cuttings and a customer eventually ordering some of that produce via the website.

   You can start with the following assumptions:

   a) Assume that the grower and customer are already in logged in states at the beginning of their processes (i.e., no need to include activities involved in login/register)

   b) The delivery process is handled by an external company. There is therefore no need to include any activities associated with the delivery process *other than those that involve the system being designed and/or other actors in the process*

   Remember to balance detail with clarity in your diagram. Take note of the following guidelines regarding scope:

   a) Use around 2-3 swimlanes to differentiate system activities initiated by different actors. For activities performed by a subsystem with no interaction with an actor, you may use a separate "system" swimlane, however, ensure all other activities performed in actor swimlanes describe system interactions.

	b) Use up to 60 shapes – ideally around 50 shapes – (shapes include boxes, decision nodes, fork and join, arrows, etc.) to show the process of user activities. c) Use decision nodes two or three times and fork and join two or three times in your model. d) Preferably, your activity diagram will be vertical, rather than horizontal (this will make it easier when merging it into the submission PDF). 10. Write a short **description of your Activity Diagram** in <u>250 words or less</u>. Imagine you are presenting it to a set of stakeholders and you need to introduce concisely what it is showing (~1-2 sentences) and mention a few interesting/important activities or flows, as well as parts where you have made assumptions (~3-4 sentences). *Note that it's important to practice this skill, as you will need to contextualise designs/diagrams when you create reports/presentations.* 11. Save your submission and cover page as a single PDF
Presentation requirements:	This assessment task must be formatted in the following way: • 12 point font • All diagrams large enough to be legible Use the following naming convention for your PDF submission: "Firstname_Lastname_IFN552Assessment1_Day-Month-Year" Ensure you include a cover page including: • Your name • The name of your tutor
Resources needed to complete task:	• IFN552 Blackboard site • Attendance at tutorials • Diagram modelling software (some examples of free to use tools will be provided in tutorials) • Extra resources and discussion on Slack • Chatbots on Slack • QUT Cite|Write APA guide.

Assignment 1 Case – Micro Farming Start-up

Company Case Study: BoxUp Micro

A fictional company using micro-farming to create a sustainable produce industry in urban areas.

Background: Your client is a micro-farming start-up that aims to bring farming to urban areas through the power of the crowd. They send out "Grow Kits" to individuals and small businesses to set up in small areas like backyards and balconies, the produce of which, they plan to collect and sell in an online store. "Growers" buy a kit from the company, set the system up and grow the produce. When produce is ready, growers will then box the produce up and book an exchange, where a delivery person will come to swap the produce box with a new set of seeds/cuttings. Once produce is received and checked, the company will pay the growers based on a predetermined price per weight of usable produce.

Problem: The business is in a period of growth, and wishes to streamline some of the complexities around the collection of small amounts of produce from individuals (as opposed to the simpler process of large scale supply traditionally done in the rest of the fresh produce industry). To do this, they plan to introduce sensors into existing and new Grow Kits that will collect data on the growth of produce plants which will feed into a forecast of inventory for the online store.

In addition, they also need to integrate an account management section for Growers on the existing website, which currently only acts as an online store.

It is your task to determine requirements and start the process of designing the new integrated system through a range of system design and analysis techniques.

ADDITIONAL INFORMATION

Sensors: Sensors in each kit will collect plant-growth data (e.g., CO_2, moisture, root growth, etc.), which will be sent to a central database and displayed via a web application to Growers.

Grow kits: Grow kits contain a variety of seeds & cuttings of in-season produce like vegetables, fruits and herbs. Starter kits also include flat-packed growth containers, dehydrated soil & nutrient packs, as well as the sensors. When someone signs up to be a Grower, they can select from various sizes of grow kits (e.g., small, medium, large), which will be delivered to them so they can start growing.

Produce collection and Replenishment: Kits are replenished with new seeds/cuttings when the previous set is fully grown and ready to be harvested. Sensor data enables an algorithm to detect produce harvest time, which will prompt a notification sent from the system to the Grower, with a range of options to set pickup/delivery times. Kit replenishment is done at the same time as fully grown produce is collected: a delivery driver is booked, who brings replenishment seeds/cuttings and collects the box of produce grown and harvested by the Grower. The Grower can opt to meet the driver, or simply leave the box of produce at their doorstep for the delivery driver to swap the seeds/cuttings for. Seeds/cuttings sent depend on the season (i.e., winter, spring, summer, autumn).

Online store: The online produce store is a simple store where customers can select boxes of mixed produce of varying sizes. These boxes will generally be different from the individual boxes of produce sent to the company by Growers, as they will include a smaller set of more diverse fruits/vegetables and herbs put together by the Produce Managers at BoxUp Micro's warehouse.

The boxes are currently set up as "lucky dips", where customers will not know exactly what each box has, however, recent market testing has indicated that customers would prefer to know exactly what they are getting in order to plan their meals. There is therefore a need to integrate the sensor data from Grow Kits into the system in order to better forecast the inventory of produce available to each of the Online Store produce boxes.

Integrated system: With the upgrade of the Grow Kits to include sensors that transmit data to a centralised database, an algorithm has been added which can forecast when certain produce will be available and in what numbers. This algorithm is called GrowPredict. The business would like to use GrowPredict to help connect the currently separate systems of the online store and the Grower portal (which handles Grow Kit replenishment and produce collection).

Ideally, by integrating these into one system, the forecast provided by the algorithm will feed into the stock levels of produce shown on the website. Conversely, the purchase data from the online store will help determine the types and numbers of seeds/cuttings sent out to Growers in replenishment kits.

Stakeholders: Business owners & staff, customers of the online store, and the "Growers".

The above provides a general overview of what is required of the new system. You will need to combine brainstorming with some limited interviewing (via three chatbots provided on Slack) in order to determine what is required for the new system.

As there are no set requirements that we are looking for, you have the opportunity to be proactive and creative, however, remember to **make sure that the solution you provide matches the case** (i.e. remember to keep referring back to the information provided in the above case description to avoid contradicting any of the details).

Submission Information

What you need to submit:	**One** PDF document that contains the following items: 1. Cover page 2. List of questions for stakeholders 3. Requirements Matrix with description 4. Use Case diagram with description 5. Activity diagram with description
How to submit:	This assessment is to be submitted digitally through Turnitin on Blackboard. Submissions that are received via any other medium (e.g. email) will not be marked. 1. Access the Turnitin Submission link >>View/Complete 2. Click on the Submit button

	3. Give the submission a title, select the correct file and click Upload.
	4. Click Confirm.
	5. Click Return to Assignment list
	6. **ALWAYS check your student email for the submission receipt.**
Moderation:	All staff who are assessing your work meet to discuss and compare their judgements before marks or grades are finalised.

Academic Integrity

As a student of the QUT academic community, you are asked to work to uphold the principles of academic integrity during your course of study. QUT sets expectations and responsibilities of students, more specifically it states that students "adopt an ethical approach to academic work and assessment in accordance with this policy and the Student Code of Conduct. E/2.1 (MOPP C/5.3 Academic Integrity).

At university, students are expected to demonstrate their own understanding and thinking using the ideas provided by 'others' to support and inform their work, always making due acknowledgement to the source. While we encourage peer learning, it is not appropriate to share assignments with other students unless your assessment piece has been stated as being a group assignment. If you do share your assignment with another student, and they copy part of or all of your assignment for their submission, this is considered collusion and you may also be reported for academic misconduct. If you are unsure and need further information you can find this at: http://www.mopp.qut.edu.au/C/C_05_03.jsp#C_05_03.03.mdoc.

IFN552 | Systems Analysis and Design Assessment Task 1 Rubric

Criteria	High Distinction	Distinction	Credit	Pass	Marginal Fail	Fail/Low Fail	No Evidence
Needs elicitation – Interview Questions Demonstrate an understanding of the case by developing a comprehensive list of questions relevant to interrogating the needs of important stakeholders. Weighting: 12%	**Flawless/ Exemplary**: flawless, deep understanding of the case, reveals cohesive interrogation of the needs of the stakeholders. Questions are extremely relevant; it is made extremely clear that the questions proposed would lead to a useful list of needs specific to functional requirements of the system.	**Very good**: does not miss anything important, and shows that the author has deep understanding of the case. There are however some very minor omissions. Questions are very relevant; it is made very clear that the questions proposed would lead to a useful list of needs specific to functional requirements of the system.	**Good**: reveals attention to detail, but there are some minor mistakes, omissions and inconsistencies. Questions are relevant; it is made mostly clear that the questions proposed would lead to a useful list of needs specific to functional requirements of the system.	**Satisfactory**: reveals little attention to detail. There are some important inconsistencies, omissions and mistakes. Questions are somewhat relevant; it is made somewhat clear that the questions proposed would lead to a useful list of needs specific to functional requirements of the system.	**Unsatisfactory**: lacks important details, there are significant inconsistencies and omissions, and lack of clarity throughout. Multiple irrelevant questions; it is not made clear that the questions proposed would lead to a useful list of needs specific to functional requirements of the system.	**Unsatisfactory**: lacks many important details, there are significant inconsistencies and omissions, and many parts are largely unclear Questions are mostly irrelevant; it is entirely unclear that the questions proposed would lead to a useful list of needs specific to functional requirements of the system.	**Unsatisfactory**: little to no evidence of an understanding of the case, no clear needs are provided Questions are either omitted or completely irrelevant/unclear.
Requirements Matrix + Description Formulate, prioritise and categorise a list of the functional requirements of the system by applying relevant techniques.	**Flawless/ Exemplary**: flawless, deep understanding of the case, provides a clear presentation of all details, highly appropriate formation of requirements from the details of the case. Requirements accord extremely	**Very good**: does not miss anything important, shows that the author has deep understanding of the case, and provides a clear presentation. There are however some very minor omissions. Requirements accord very well	**Good**: reveals attention to detail, but there are some minor mistakes, omissions and inconsistencies. Requirements mostly accord with the principles of being specific, measurable, actionable and relevant.	**Satisfactory**: reveals little attention to detail. There are some important inconsistencies, omissions and mistakes. Requirements somewhat accord with the principles of being specific, measurable,	**Unsatisfactory**: lacks important details, there are significant inconsistencies and omissions, and the matrix is difficult to understand. Most requirements lack accordance with the principles of being specific, measurable,	**Unsatisfactory**: matrix is unclear and lacks many important details. The elements in the matrix seem unrelated. Requirements do not accord with the principles of being specific, measurable, actionable and relevant.	**Unsatisfactory**: matrix is missing or there are significant inconsistencies. No description provided.

	Flawless/ Exemplary	Very good	Good	Satisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory
Weighting: 27%	well with the principles of being specific, measurable, actionable and relevant. The description is concise and relevant to the case, and reveals deep understanding of the overall purpose of the matrix.	with the principles of being specific, measurable, actionable and relevant. The description is concise and relevant to the case, and reveals good understanding of the overall purpose of the matrix.	The description is somewhat concise and relevant to the case, and reveals some understanding of the overall purpose of the matrix.	actionable and relevant. The description is unrelated or reveals little understanding of the overall purpose of the matrix.	actionable and relevant. Description is either missing or is largely unclear/irrelevant.	Description is either missing or is largely unclear/irrelevant.	
Use Case Diagram + Description Apply appropriate UML techniques to clearly describe important aspects of the case in a Use Case Diagram Weighting: 27%	**Flawless/ Exemplary**: flawless, deep understanding of users and their goals in using the system and different use cases, presentation of all details, using appropriate labelling and correct associations and presenting a cohesive view. The description is concise and relevant to the case, and reveals deep understanding of the overall purpose of the Use Case Diagram.	**Very good**: does not miss anything important, shows a deep understanding of users and their goals with appropriate use cases, and provides a clear presentation. There are however some very minor modelling mistakes or omissions. The description is concise and relevant to the case, and reveals good understanding of the overall purpose of the Use Case Diagram.	**Good**: reveals attention to detail, but there are some minor mistakes and inconsistencies in modelling. The description is somewhat concise and relevant to the case, and reveals some understanding of the overall purpose of the Use Case Diagram.	**Satisfactory**: reveals little attention to detail, there are some important inconsistencies, omissions and mistakes in modelling. The description is unrelated or reveals little understanding of the overall purpose of the Use Case Diagram.	**Unsatisfactory**: lacks important details, there are significant inconsistencies, and the model is difficult to understand or seem to be somehow irrelevant. Description is either missing or is largely unclear/irrelevant.	**Unsatisfactory**: lacks many important details, there are many significant inconsistencies, and large parts of the model seems unrelated or unreadable. Description is either missing or is largely unclear/irrelevant.	**Unsatisfactory**: Diagram is either missing or is unrelated to the case. No description provided.

Activity Diagram + Description	Flawless/ Exemplary	Very good	Good	Satisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory
Apply appropriate UML techniques to clearly describe important aspects of the case in an Activity Diagram Weighting: 34%	**Flawless/ Exemplary**: flawless, deep understanding of the system and all elements, presentation of all details, reveals modelling mastery and cohesive view. Excellent use of relevant shapes, demonstrating great skill in balancing detail with clarity. Exceptional description of the diagram and its purpose, highlighting all relevant assumptions. Very clear communication of important aspects of the diagram.	**Very good**: does not miss anything important, shows a deep understanding of the system and all elements, and provides a clear presentation. There are however some very minor modelling mistakes or omissions. Very good use of relevant shapes, demonstrating good skill in balancing detail with clarity. Very good description of the diagram and its purpose, highlighting most relevant assumptions. Clear communication of important aspects of the diagram.	**Good**: reveals attention to detail, but there are some minor mistakes and inconsistencies in modelling the system. Good use of relevant shapes, demonstrating reasonable skill in balancing detail with clarity. Good description of the diagram and its purpose, highlighting some relevant assumptions. Mostly clear communication of important aspects of the diagram.	**Satisfactory**: reveals little attention to detail, there are some important inconsistencies, omissions and mistakes in modelling the system. Satisfactory use of relevant shapes, demonstrating some skill in balancing detail with clarity. Acceptable description of the diagram and its purpose but relevant assumptions are overlooked. Somewhat clear communication of important aspects of the diagram.	**Unsatisfactory**: lacks important details, there are significant inconsistencies, and the model is difficult to understand or seems to be somehow irrelevant. Somewhat unsatisfactory use of relevant shapes, demonstrating little skill in balancing detail with clarity. Somewhat inadequate explanation of both the purpose of the diagram and the related assumptions. Communication of important aspects of the diagram lacks clarity.	**Unsatisfactory**: lacks many important details, there are many significant inconsistencies, and large parts of the model seems unrelated or unreadable. Many of the shapes used are irrelevant/incorrect, and there is no balance of detail and clarity in the diagram. Mostly inadequate explanation of both the purpose of the diagram and the related assumptions. Largely unclear communication of important aspects of the diagram.	**Unsatisfactory**: Diagram is either missing or is unrelated to the case Missing description of the diagram