Requirements examples

2021-22 Coursework specification

Given your problem statement and target audience from coursework 1, capture and document a prioritised set of requirements for the project.

To do this you will need to select and apply any appropriate technique(s) to:

- Identify the requirements
- Document the requirements
- Prioritise your requirements

Consider whether your chosen technique(s) is/are relevant to your overall project methodology. For example, if you are following Scrum then you might reasonably be expected to document user stories rather than a table of functional and non-functional requirements.

There may be other techniques that are useful to model and understand your requirements such as use cases, UML activity diagrams etc. Use any appropriate techniques.

Strong example

Tutor comment

Feedback given to the student "A good justification for the choice of requirements elicitation, specification and prioritisation that is supported by appropriate references. The context diagram and user stories appear comprehensive and are well written and have been appropriately prioritised."

A context diagram was not required, the student chose to include this.

Their choice of prioritisation was different from that chosen by most and showed evidence of their independent research. Having now given this as an example though it would no longer be considered as such!

The inclusion the functional/non-functional identifier in the user stories is not usual so please don't just copy what they did, however the student gives their reason for doing this.

The final paragraph justifying their prioritisation was not necessary, however it gives insight into their decisions on prioritisation.

Student submission

Requirements identification methods

From the 9 techniques listed in BAKOK, the following techniques will be used in the project. (BABOK, 2015)

Brainstorming: The group will have a discussion and share ideas to derive creative ideas for the problem. It is applied to the project because the project group has 5 people from diverse background and they are willing and engaged in the participation.

Prototyping: Throughout the life cycle of the product development, capture requirements from each iterations. It can perfectly incorporate with Scrum. For each sprint, the requirements will be evaluated with user stories and validate it in the next sprint. It has smaller costs because it can have early feedback and aviod infeasible solutions. Since the

project group is full of experienced product manager and developers, they are equiped with technology knowledge and able to solve complex case through iterations.

{the student went on to cover other methods also however I have removed these as the above is sufficient for you to see how they approached this part of the coursework}

Requirement specification method

User story is used to specify the requirements because the project methodology selected is a combination of Scrum and CRISP-DM. User story is an important part in Agile method. (Abdollazadeh, 2021)

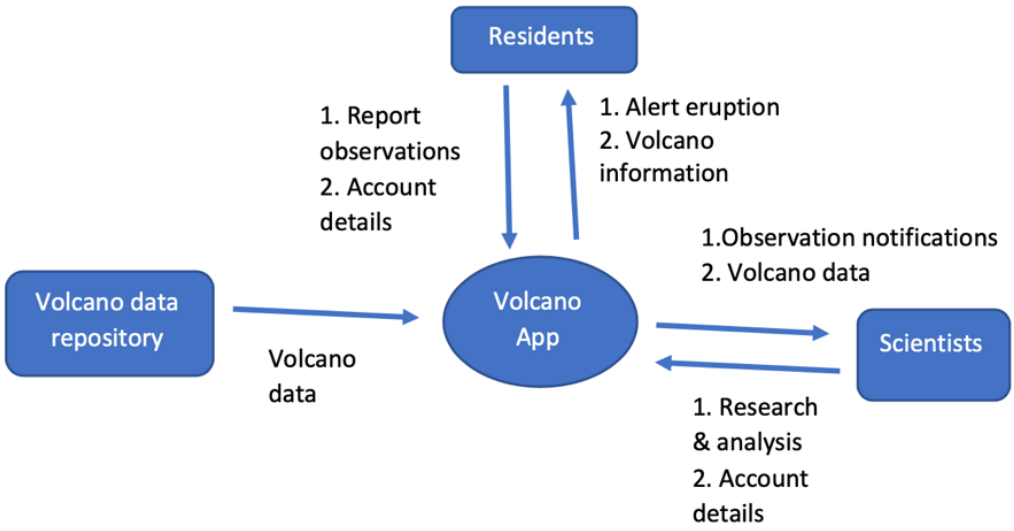
For each sprint in the Scrum, stories in the sprint help the team to focus on the real needs of the end users and have a better understanding.

Prioritisation method

100 points method: Considering the project methodology selected is a combination of Scrum and CRISP-DM. Scrum requires each sprint to be finished in very short period of time, normally 1-4 weeks. It is essential to save time and iterate from the feedback. 100 points method is selected to measure the priority for different requirements with quantitative values in simple and direct way. In addition, the project group are 5 senior developers and product managers, they will provide professional evaluation on the requirements. It is not necessary to include other prioritisation method because they can make good justification based on their own experience. They know what requirements are likely to be essential to the app and they will give more points for higher priority.

Context diagram

The context diagram is used to visualise the interactions between the stakeholders, data repository and the app.



Documented and prioritised requirements

Number	User story	Acceptance Criteria	Functional/non-functional	Points
US01	As the residents lived near a volcano, I want to receive the eruption alerts on my IOS or Android phone so that I can receive that at any time.	1. Able to access and download through major app stores like Apple store and Google store 2. Support recent 5 versions of Android and IOS	Non-functional	20
US02	As the scientists, I want the app to support Chrome, Firefox, and Safari so that I can use the app at any browsers.	1. Support recent 5 versions of major browsers 2. Comply with cookie policy	Non-functional	15
US03	As the residents who interested in volcano, I want to search the volcano that lived with so that I can learn about its history and other information.	1. Able to search according to volcano name or number 2. Return results within 2 seconds 3. Data is retrieved from volcano data repository using an authenticated API. 4. The general public are not required to create an account for searching volcanos	Functional	15
US04	As a geologist I want to receive the notifications when the subscribed volcano has new observations so that I can update my research with more information.	1. Be notified when someone share observations according to preferences 2. Get notified within 5 minutes	Functional	10
US05	As a geologist worked in UCL, I want to post my research and predictions so that I can share it with other	1. Connected and verified with education/research institutions account management API	Functional	10

	researchers over the world.	2. Support login through SSO (Single Sign-On) 3. Support sending pictures, videos, and texts 4. The shared research should be recorded and trackable		
US06	As the residents, I want to create an account so that I can receive alert and change my contact details.	1. Contact details contain phone number, email address, resident address, password and name 2. One resident can subscribe multiple volcano alerts 3. Data storage and use must comply with data protection law 4. Send alerts to residents within 1 second	Functional	10
US07	As the residents lived near a volcano, I want to be able to submit a monitoring report so that I can share some observations about the volcanos.	1. Support sending pictures, videos, and texts 2. The user's resident address should be verified 3. The submitted report should be recorded and trackable	Functional	5
US08	As a geologist I want to tailor and save my preferences of types of charts so that I can save time on preparing and visualizing data.	1. Display options of charts 2. The elements of charts like axis label and caption are displayed and editable 3. Data like eruption period and date can be chosen by the users 4. Create charts from browsers on PC or laptop 5. Data is retrieved from volcano data	Functional	5

		repository using an authenticated API.		
US09	As a geologist, I want to have download functionality so that I can use the data and charts for further analysis.	1. Download the data as xlsx or csv format 2. Download the chart as jpg or pdf format 3. Finish the downloading within maximum 60 minutes depends on the size of data and charts. 4. Data is retrieved from volcano data repository using an authenticated API.	Functional	5
US10	As a global geologist, I want to have translation functionality so that I can understand the observations from the residents.	1. Connected with Google or Microsoft translation API 2. Return the translation results within 5 seconds	Functional	5

Considering the non-functional requirements are essential for the app use and it allows more target audience to access it, it is given 35 points in total. US01 is about the eruption alert which is important for protecting the resident's lives. Therefore US01 costs more points than US02. For US03, it only requires a search function which is easy to build up and costs less time than others. People can use this function in a very short period of time. For US04-US06, these are basic interactive functions for the app, it allows the scientists to carry on the simple research and the residents to receive the alerts. For US07-US10, these are advanced functions of the app and can be developed in the future. Some requirements can be substituted with other apps but less convenient for the users. For example, when the user need to translate some observations, he/she can copy the content and paste in the external translator like Google translate. It is less convenient compared with internal translation API. It is not essential but could have in the future.

Pass example

Tutor comment

“The justification for the requirements elicitation and specification approaches don't entirely make sense, I don't really understand how TDSP and brainstorming are similar for example. Likewise the documented requirements are confusing to understand, there is a list

of user stories that appear appropriate, but then there is a second list that says it is prioritised but contains different requirements using a different format. You should use one or the other, not both. What is the purpose of the use cases and why have they got star trek names in? An actor in a use case describes, for example, a role that interacts with the system so perhaps a user or a manager. The use cases don't appear to relate to the requirements."

This submission lacks coherence and appears a collection of techniques that are inconsistently applied. It would have been better to make an informed choice of techniques, use less techniques, and then apply them appropriately.

Student submission

Requirements identification method

In this case Brainstorming method is chosen as the identification method which provides open environments where users are free to give their requirement and expectation of the system. The data is then collected, discussed and analyzed.[1] The interview method and workshop method might also be suitable but it is impossible to generate online surveys and questionnaires; interview people or invite others to participate in a workshop as these activities require UCL ethics approval. This means we will not be able to obtain in time to complete the project. The basic stages of team data science are: 1.Business understanding 2.Data acquisition and understanding 3.Modeling 4.Deployment 5.Customer. The stages of TDSP are very similar to the process of brainstorming method.

Requirement specification method

In this case, the user story(Natural language) is chosen as the requirement specification method instead of use case method. The first one requires that each requirement should focus on a single distinct feature or behaviour and should be written in the same uniform while the use case method are used to describe the interactions between the system and the external users of that system (called actors) that allows those actors to achieve particular goals.[2] Addition to that, an agile template can replaces user stories with TDSP lifecycle stages and substages and it is much easier for the data scientist to do.[3]

Prioritisation method

MosCow method is chosen as the prioritisation method. The MosCow is a popular prioritization technique for managing requirements and it has a straightforward set of requirements used to determine the importance of initiatives.[4] The MosCow method can save a lot of time and everyone can have a objective view of their needs. It separates the data clearly into 4 groups(must have, should have, could have, won't have)

Documented and prioritised requirements

{ Note also that 'unfunctional' should be 'non-functional'.**}**

RQ1	The app shall display a list of numbers of different type of vehicles in the recent decay.	Must have	Functional
RQ2	The app shall display the extent of increase or decrease of different type of vehicles in the recent decay.	Must have	Functional
RQ3	The app shall display a list a fuel and the number of vehicles that burns it	Must have	Functional
RQ4	The number of vehicles, the extent of increase or decrease of vehicles and the fuel list must not be displayed all together to cause confusion of the clients. E.g., if the client wants the number of vehicles only, the relevant data will be display and the others will not.	Must have	Functional
RQ5	The app shall also display which brand of car	Could have	Functional
RQ6	The app shall be available on PC	Must have	Unfunctional

Users	Data searching	Priority	
US01	As a manager from sales department of an insurance company, I want to be able to see the numbers of different types of vehicles so that our company can make scientific decisions to adjust the premium rate etc. to make profit.	Must have	Functional
US02	As a Senior Manager from an auto manufacturer, I want to be able to see the number of different types of vehicle increase/decreases to adjust to production and the marketing strategy to lower the inventory and improve service for the customer.	Must have	Functional
US03	As an entrepreneur from fuel industry, I want to be able to see the numbers of vehicle that burns a particular kind of fuel (e.g., Gasoline) so that my company can adjust the supply of the fuel and results in a reasonable price to make more profit.	Must have	Functional
US01	As a client I want to be able to access the app using PC so that I can use when I am in my office.	Must have	Unfunctional
US02	As a client I want the system to provide enough guidance so that it saves my time to use the app.	Must have	Unfunctional
US03	As a client I want the data to be clean and easily understood.	Must have	Unfunctional

Use case 01	Login
Brief description	User logs in
Primary actors	James Kirk, James T Kirk and Sherry Su
Pre-conditions	User has an account
Main flow	1. User enters log in details and submits 2. System checks if details match those registered 3. If match the user is logged in and returned to the page they were accessing when login was attempted
Alternative flows	3A. Partial details match. Warn user and allow them to-renter login details 3B. No match found. Warn user and allow them to-renter login details.

Use case 02	Logout
Brief description	User logs out
Primary actors	James Kirk, James T Kirk and Sherry Su
Pre-conditions	User is logged in
Main flow	1. User clicks to log out. 2. System logs them out and redirects to the landing page
Alternative flows	

Use case 03	Sign up
Brief description	User creates an account
Primary actors	James Kirk, James T Kirk and Sherry Su
Pre-conditions	User does not have account
Main flow	1. Complete new account form and submit. 2. If form validation passes, create new account 3. Log in the user automatically and redirect to home page
Alternative flows	2A If form validation fails, prompt user to correct specific error

Use case 04	Reset password
Brief description	Users reset password
Primary actors	James Kirk, James T Kirk and Sherry Su
Pre-conditions	Users forget the password
Main flow	1. click “forgotten password” 2. complete new password form and submit 3. If form validation passes, redirect to the landing page
Alternative flows	3A If form validation fails, prompt user to correct specific error

Use case 05	Search for the data set
Brief description	User search the data set they want to see
Primary actors	James Kirk, James T Kirk and Sherry Su
Pre-conditions	Logged in
Main flow	1. Type the data set they want to see
	2. If the text in the text bar matches the result in the data base, redirect to the data set
Alternative flows	2The data set is not found, warn the user and allow them to retype the name.