Assignment 1: Individual Submission

Assignment Submission Date: Refer to LMS (all times are AEST)
Assignment Weight: 20% of Total Subject Score (17% due week 5 and 3% due week 12)

Overview:

This is an individual assignment. It deals with the topics in project management and Software Development Lifecycles. The aim of this assignment is for you to develop a better understanding of various SDLC models and their relationship to other aspects of the project by analyzing the case study given in Appendix A.

Learning Outcomes:

By a through analysis of the project described in the case study, students will demonstrate the ability to:

- Identify the goals of the project
- Identify the key characteristics of the project
- Identify the risks in the project as identified at the start of the project
- Justify the choice of an appropriate software development lifecycle (SDLC) model for the project

Submission Instructions:

Read and analyze the case study 'Trisha's Dollar Den' in Appendix A, and answer the questions related to the software product to be developed. Make sure to mention the question numbers properly for the answers. Your answers must have the appropriate justifications and citations where appropriate; use IEEE citing and referencing (More information on referencing - recite (unimelb.edu.au)).

Submit your work using the Turnitin link on the Assignment tab on Canvas. From the SWEN90016 CANVAS page, select Assignment 1 submission link from the menu, and then select View/Complete from the Assignment item and following the instructions, upload a PDF file containing your responses to questions
Your submission must include the following - *Name, Student ID and the Assignment Submission Report.*

Late Submissions:

Late submissions without an approved extension will be subject to a penalty of 1 mark per day (including half days). Weekends count as a single day. No assignment will be accepted more than one week late.

Plagiarism:

Cheating by students is not permitted in any form. Work submitted by students for assessment must be their independent work. The University Policy and Procedures for Academic Misconduct can be found at: https://academichonesty.unimelb.edu.au/#policy.

Assignment 01 - Questions

All questions refer to the 'project' which is the first phase of development of the website and mobile application.

Section 1: Short Research Questions

Q1 - Identify the business case (need) for the project. (Maximum 50 words - 1 mark)

Section 2: Extended Research Questions

Q2- Identify and discuss two constraints for the project. (Maximum 200 words - 2 marks)

Q3 - Identify two challenging characteristics that would make the project difficult. Discuss why you consider them challenging. (Maximum 200 words – 2 marks)

Q4 - Identify four things that could go wrong – *Risks*, resulting in the project not achieving the intended goal/s. Ensure that you identify risks that are unique to the characteristics of this case study, rather than generic risks that can occur in any project. Generic risks include project members leaving the project; running out of budget before completion; IT security risk (Note the list of generic risks given here is not exhaustive). Describe the *Impact* each of these risks could have on the business, project and/or the software product.(Maximum 250 words - 4 marks)

Section 3: Discussion

Q5 - Discuss two possible lifecycle models (SDLCs) you would consider for the project. This should include the pros and cons of each of your choices referring to specific project characteristics and risks *you* have identified. Use case study references and external references to support your argument. (Maximum 800 words – 6)

Q6 - From the 2 possible choices in Q5, choose the most suitable SDLC and justify your choice referring to specific project characteristics and risks you have identified. (Maximum 200 words – 2 marks)

Section 4: Ethics

Q7 – Question to be released at a later date. Due Week 12 (3 Marks)

NOTE: Q1 to Q6 will be assessed at the time of submission in week 5. While Q7 is treated as part of Assignment 01, this question will be released at a later date and assessed separately. You are expected to submit only answers for Q1 to Q6 on or before the Assignment 01 Submission Date. There will be a separate link for you to submit Q7.

Appendix – A

An e-Commerce solution with a Mobile Application for Trisha's Dollar Den

Trisha is a successful entrepreneur based out of Bendigo, Victoria. She successfully started and manages a small chain of food stores that sell Asian delicacies and food items. Examples of these 'specialty' food items are

1. The Jackfruit, a tropical fruit mostly grown in the Western Ghats of South India and Sri Lanka. They can grow as large as 55 kg, and are a rich source of vitamins and antioxidants which have multiple health benefits[1] [2];
2. The Targola or Ice Apple Fruit, a type of palm fruit in South India. It grows in clusters and has texture similar to the lychee fruit, and they are an excellent coolant, immune system booster and a rich source of potassium which promotes liver health[3].

These lesser-known food items are popular both with the expatriate Asian community and with local communities.

In 2019, Trisha travelled to the United States of America for a vacation. In the United States, she was impressed by the business model of a discount variety store called 'Dollar Tree'[4], wherein she found all items costing just $1, irrespective of the item. After doing some research, she identifies Daiso[11] as a store with a similar concept. Daiso sells many different types of Japanese items all for $2.80[11]. After visiting a Daiso store in Melbourne, she decides to improvise the concept of a dollar shop and Daiso, by focusing on the delicacy food items that she is currently selling.

Trisha created a business plan to start a new chain of stores in Australia called 'Trisha's Dollar Den' in May 2022, where all items will cost $2 irrespective of the item. As part of this plan, Trisha will rebrand her existing three shops to become a part of the new 'Dollar Den Shops'. In addition, she plans to open 5 new 'Dollar Den Shops' in Victoria. She presented this business plan to one of the leading financial institutions in Australia and they like her business model and business plan. The institution has sanctioned a loan of $300,000 to establish an initial chain of 5 'Dollar Den' stores in main and regional cities of Victoria, specifically Clayton, Melbourne, Pakenham, Traralgon and Ballarat. This will be in addition to converting her 3 existing stores to be a part of the new 'Dollar Den' chain – thereby making the total number of 'Trisha's Dollar Den' shops to be at eight.

Requirements for a new eCommerce site and a Mobile Application

As part of this rebrand and expansion, Trisha researched different applications that are available for retail managers. Based on this research, Trisha realises that it is important to develop a simple e-commerce web application and a mobile application app to support 'Trisha's Dollar Den' e-commerce activities. Trisha has contracted the services of a company 'Simple Solutions', a small IT development company formed by former students of Melbourne University. 'Simple Solutions' has expertise in the development of e-commerce solutions for small businesses. They also have a good reputation (many positive reviews from customers) and are known as producing value-for-money solutions. A low cost for a new e-commerce system is a critical consideration for Trisha because she has a loan amount of $300,000 that needs to be wisely used for all expenses related to her

expansion (such as all her rebranding and expansion costs; initial bonds and rental space for new 'Dollar Den' stores, marketing / advertising expenses, and operational expenses, to name a few), in addition to developing the new e-commerce solution.

This cost consideration has kept Trisha away from adopting an out-the-box off the shelf solution from popular companies in the market. She feels her requirements are very specific and the time / cost required to customize an off the shelf solution could be higher than procuring a company to create a tailor-made e-commerce solution. The first phase of the e-commerce application has been planned to be completed in about 9 months, starting in August 2021, and scheduled to be completed just before the launch of her 'Dollar Den' stores in May 2022. Trisha has discussed her requirements, and these are described in the following paragraphs.

Trisha's research into the recent digital consumer trends in Australia identified that 92% of the Australian consumers have access to a smartphone[5]. As such, Trisha wants to create a new mobile application for customers to shop in her 'Dollar Den' stores. Trisha is planning to roll out the mobile application to support Apple and Android platforms only. To start with, the mobile application should support the creation of a basic user profile with sign up information. As a part of the sign up, the user should be able to add – (i) an email ID to serve as the user's name, (ii) a strong password of at-least 10 characters, (iii) their first and last name, and (iv) a customer phone number for authentication. Other details in the basic customer profile (such as the customer's mailing address, setting up different forms of payment and setting up shipping addresses) should be available for the customers to complete before setting up an online order (and these are not stored). Once the customer is logged in, they should be able to select the food items based on their type (such as fruits and vegetables, bakery items, pantry items and special items on sale, to name a few categories) and add the items they wish to order to a shopping cart. They can then checkout and pay for the items in the cart. The mobile application should also provide a robust search function that customers can use to add items into the shopping cart directly. The customer profile should have a history of previous purchases (for the previous year).

Trisha currently calls her suppliers twice a month to order the food items. The process at the moment is manual and she spends a lot of her time on the phone, talking with her suppliers. This is something she believes can be handled automatically by the e-commerce system. While she does keep a record of her stock, most of her re-orders are based on a gut feeling of how many orders she expects in a given month rather than based on analyzing customer demand from previous months based on the cost of stocking excess food inventory items. Sometimes she orders more food items than required just to avoid having to say that the 'item is not available' and disappoint her customers. During an annual year-end review and reconciliation of sales and profits in 2019, she discovered that overall she had wasted about 20% of her food inventory. This wastage resulted in her profit margins going down by about 25%. To address this issue, Trisha wants to incorporate a smart algorithm to manage the bimonthly re-ordering of food items from suppliers on an 'only as much as required' basis. In other words, the algorithm should be able to

(i) Analyze the customer orders from the last 5 years and understand the demand of items;

(ii) Analyze the costs that are involved to stock these food items on the shelf,

(iii) Analyze the lead times (the time it takes between an ordering an item and the delivery of that item from the supplier) for the different suppliers of Trisha. This is to effectively fine tune the reorder process with the suppliers.

To boost sales, Trisha has manually, once a quarter, given promotion codes to regular customers. Currently all regular customers receive the same promotion code a 10% discount off their final bill. Some of her customers have been shopping with her for a long time and also buying food items and products in bulk and she realises that this one promotion code is limited. Trisha wants to reward customers who 'buy often and in bulk quantities' with a higher discount. Specifically, customers ordering more than once a month and for more than $1,000 should receive a better promotion, a 15% discount on the final bill instead of the 10% discount that other regular customers receive. To help her create different promotions, Trisha wants to have a smart algorithm that analyzes the customer spending patterns over the last 5 years. This algorithm should help identify which customers receive which promotion. In addition, she wants to have a feature in the new e-commerce system that can send out these different promotion codes automatically to customers in her mailing list at specified times and eliminate the manual process. As a part of this smart algorithm, she also wishes to identify those customers that are giving her 'high volume' business so that she can offer exclusive discount events. An example of an exclusive discount event could be a bigger discount (e.g. 20%) for items bought during a specific time period (e.g. on the last Friday of the month). Note that customers cannot use their normal customer profile login to participate in these special events. For those identified customers only, she wants to send a one-time special login mechanism (username / password) to use in the new mobile application, for participation in the exclusive discount event.

Furthermore, Trisha currently manually analyses customer shopping patterns. She has found certain interesting combinations of food items that are popular among customers during each purchase. For example – the analysis reveals that (i) about 73% of customers who buy ''Barbari Bread[6]' also buy at least 1 kg of fruit Goje Sabz (Greengage fruit[7]) and (ii) about 77% of customers who buy 'Sangak Bread[8]' also have at least 500 gms of Azgil fruit (Loquat fruit[9]) in the same transaction (to name a couple of patterns). Trisha heard from her cousin Asha, a recent graduate of Melbourne University, that Machine Learning algorithms can help with identifying interesting data patterns [10 (such as these described)]. Trisha would like to have this information so she can use it to increase her sales. The new e-commerce system should support a smart algorithm that can identify customer shopping trends such as the example given here.

Finally Trisha is trying to contribute in her small way to a better environment, and has decided to encourage customers to adopt digital receipts for all their purchases. She wants receipts for purchases to be available for download from the customer's profile when customers are logged in the mobile app. She thinks it would be good to have some user interface customization options and generate targeted customer specific marketing emails based on their shopping habits, but these two requirements (storing digital receipts and target marketing) have been planned for the future (Phase 2). As she has 8 stores, she also has plans for certain enhancements to the e-commerce system. These wish-list items are

1. a rostering system to handle employee scheduling,
2. a facility to remit the sales tax to the government based on her monthly sales.

Trisha is an optimistic and hard-working personality and is confident that her 'Dollar Den' business can be expanded further. She plans to research and start expanding the offerings in her stores to also include other specialty 'nonperishable' merchandise (e.g. health and beauty products). The financial institution has agreed to re-evaluate additional funding for future expansion after 3 years.

Trisha and 'Simple Solutions' are finalizing the details of the project which will cover the first phase of development. To facilitate development, Trisha has agreed to share existing data (such as customer order receipts, sales data, supplier information etc) with 'Simple Solutions'. The existing data is a combination of computer files (such as word, excel, pdf documents) as well as printed copies of paper ('Business Data' that Trisha has been manually managing).

IMPORTANT - While references from Wikipedia used in the case study are to illustrate some non-familiar and domain specific concepts in a lucid and simple manner, you are advised to think before using Wikipedia in your responses. Academic arguments (such as your answers in the Assignment) should make use of scientific references only.

For more information on referencing, please refer to the university guidelines at recite (unimelb.edu.au).

References

[1] - Jackfruit: Nutrition, Health Benefits, & How to Prepare (webmd.com)
[2] - Jackfruit - Wikipedia
[3] - Health benefits of eating ice apple fruit (healthshots.com)
[4] – About Us | Dollar Tree (dollartreeinfo.com)
[5] - Digital Consumer Trends 2020 | Deloitte Australia | Technology, Media & Telecommunications, Mobile, Trends
[6] - Barbari bread - Wikipedia
[7] - Greengage - Wikipedia
[8] - Loquat - Wikipedia
[9] - Sangak - Wikipedia
[10] - Association Rule Mining. The Data | by Surya Remanan | Towards Data Science

[11] Daiso

[12] Lead time