The University of Melbourne
School of Computing and Information Systems
SWEN90016 Software Processes and Management
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Name: Mingzhe Du
Login: mingzhed@student.unimelb.edu.au
Student ID: 892896

Section 1: Short Research Questions

1. Identify the major goals for the software product. (maximum 50 words - 1 mark)
   a) Enable farmers to form unified trading blocs.
   b) Record various type of farm indicators to database timely.
   c) Help farmers intelligently monitoring the national grain price fluctuations and analysing the market trending.
   d) Enable users to operate(Post/Delete/Modify) data from multi-platform.

2. Identify the value of the software product to the external stakeholders. (maximum 50 words – 1 mark)
   a) Improve both the farmers economic prosperity selling grain and farmer's community connections.
   b) monitor the grain process and analyse the perform of market.
   c) Social network function enable farmers to connect with others. They can discuss and get feedback from other farmers.

Section 2: Extended Research Questions

3. Identify three challenging characteristics (characteristics that would make the project difficult) of this IT project and identify at least three specific risks to this project, (not generic such as running out of budget or IT security risk). Describe what impact the three risks could have on the business, project and/or the software product. (maximum 250 words - 6 marks)
   a) Three challenging characteristics:
      ● Farm X is a start-up company, and the two founders do not have relevant IT background. Having less knowledge of software development and SDLC might make them ignore some crucial points their product.
      ● Similar products may influence FarmX's marketing perform. Farmers totally can chat or discuss their crops on Facebook groups or other professional chat applications. Hence, FarmX has to contain more practical functions if it wants to dominate the market.
      ● Due to the wide variety of agricultural indicators, FarmX needs to be compatible with most common sensors, which will be a heavy workload and have an impact on data sync.

b) Specific risks to this project:
- A wide range of data structures
  FarmX plans to development a platform, which enable to manage various type of activities, crops' type, quantity and quality. Collecting enormous data could help FarmX generate concise report to farmers. However, these data generally have a wide range of data structures. Therefore, It will be a problem for FarmX to establish and manage a suitable database, especially FarmX is a start-up company without many experienced staffs.
- Cross-platform
  Because farmers may use a variety of devices, It is necessary to implement cross-platform support on FarmX. However, developing application on different platforms may need varied frameworks and programming languages. As a small company, FarmX does not have enough people and experience to develop the corresponding interface, so that it will be in a development dilemma which is the sponsor cannot observe the benefit of FarmX in time and give up the investment in next phase.
- Similar Applications
  There are many similar products like FarmX on the market. The most prominent function, social features, can also be replaced with softwares like Facebook. Due to this reason, the market acceptance of farmX may be affected.

4. Identify eight high level features (functions the IT solution should provide) of the software product and categorize their priority as high (must have), medium (good to have) or low (can do without). Give a justification for the chosen priority each requirement. (4 marks)

Requirement	Priority	Justification
Diary of crops	High	It is the core function of FarmX. The platform needs to support a wide range of farm activities.
Multi-platfrom interface	High	Farmers may use different types of devices(iPhone, Android Phone or PC). FarmX need to ensure every customers can upload or review their crops' data by various devices.
syncing from mobile devices	High	Simply relying on manual entry is a primitive method to record data. However, modern agriculture usually has massive information need to be entered. Synchronizing data with sensors therefore is an efficient way to collect agricultural data.
Monitor and analysis	Medium	Customers would like to review the perform of their crops and track the improvement timely. On the premise of completing diary entry, FarmX can use the collected data to generate a concise report for farmers, which includes relevant analysis and marketing trend.

Estimate the cost of activities	Medium	Quantizing the cost of activities actually is a complex task. Due to various situations, FarmX might not calculate the accurate result for every activities.
Syncing from other platform	Medium	Due to many existing platforms, farmers may previously use another application. As a decent way to dominate the marketing, importing data from other platforms is a good idea. However, different platforms may use different data structures and database. Adapting to most platforms will be a heavy burden to development team.
Chat, Post and comment	Low	Current social network applications, such as Facebook, WhatsApp or Message, are both able to instead this function. It is not easy to develop a better social network function. For FarmX, using some ready-made modules may be a good choice. Therefore, this part could have a low priority.
Event	Low	The justification is the same as above. As a startup company, FarmX ought to focus on their professional area. Excessive functions, such as chatting or event, may impede the FarmX's development rate. FarmX can provide relevant interfaces to social network applications, and users are able to do right things on right platforms.

Section 3: Discussion

5. Discuss two possible lifecycle models you would consider for the project and **choose** the most suitable (more suitable of the two) SDLC model and justify your choice referring to specific project characteristics and risks you have identified. Use case study references to support your argument. (maximum 800 words – 8 marks)

For this situation of FarmX [1], Waterfall model and Scrum model may be considered [4]. Following part will elaborate the features of these two models.

Waterfall model aims to simplify the complexity of development [2]. Throughout this method, separating the implementation of the function from the design process, and facilitating the division of labor. To be more specific, Winston [5] has argued that the structured analysis and design methods are used to separate the logical implementation from the physical implementation. This model has many advantages [2]. For example, it provides checkpoints by stages for the project, which means that the development team merely need to focus on the subsequent stages after the current phase is completed, instead of reviewing every stage frequently. Meanwhile, It provides a template, which allows analysis, design, coding, testing, and support methods by a common guide. However, this model also exist some disadvantages [2]. Since the partition of each stage is completely fixed, and a enormous number of documents are generated between these stages, which exceedingly increases the workload and leads poor team communication. Because the development model is linear, users can only see the results

until the end of the whole process, thus increasing the development risk. Moreover, a significant shortcoming of the waterfall model is that it is not flexible so that may not adapt to frequent changes in user needs [2].

Scrum is a type of agile methods. It tries to manage a small and self-managed team using a short collaborative release cycle, to encourage iterative software development [6]. The quality of software runs through every stage of agile software development. In essence, Scrum is not a methodology. It is a set of practices and a role framework for each process participants. Scrum allows users to quickly review an infrastructure version of the product. Compare with traditional waterfall model, It focuses on the rapid response capability, so that the customer satisfaction is high [2], [4]. However, Scrum pays attention to the personal communication and ignores the importance of documents. If the project team change too frequently, it will bring great difficulties to maintenance. Before building the entire development activity, Scrum model encourages developers to think about and document the entire process, implementing it as planned, and keeping everything as organized as possible. In addition, another distinguishing feature of Scrum model is the rapid response, which is really suitable for start-up companies, especially when the project is unclear in the early phase [6].

Depend on the specific situation of FarmX [1], Scrum model is more suitable for this company. Since Barnaby is analytical and controlling, he can be the scrum master who promotes the Scrum process, and has responsibility to removes barriers that affect the team to deliver sprint targets, while Wilma can be the product owner who is oriented to social aspects. As a product owner, Wilma represents the wishes of FarmX's customer. He ought to communicate with their customers frequently. It ensures that the Scrum team is on the right way from a business perspective [2], [6].

As we can see, FarmX is a start-up company, and two founders do not have sufficient IT experience [1]. Scrum model could assist them quickly fix their idea and plan [2], [6], [7]. Through reading this case, we can figure out that FarmX is going to develop a crop manage system [1]. However, there are several platforms that have similar functions like FarmX currently. If FarmX wants to root into the market, it has to adapt the rapidly changing market demand. In this aspect, Scrum is very flexible, able to adapt most scenarios, and can introduce other software development methodologies in a compatible manner. FarmX can quickly complete prototyping with Scrum, and then they can get many user feedback, which could help them to improve their product. In addition, how to deal with different types of data in distinct sensors is also a challenging problem [1], [8]. Due to the variety of sensors, FarmX can consider to use the iterative software development models. It means that they can implement most common sensor interfaces in the first version, and then complete remain parts in the next Iterative development cycles [2]. Like other forms of agile software design, Scrum process contains many transitional versions that can be delivered to customers. This allows users to get workable software timely while adapting the project to constant changes [3]. Obviously, It is also suitable for FarmX, which need to support multi-platforms. Under the leading of product owner

and scrum master, development team can develop the corresponding platform support interfaces in order of priority. It not only ensures the continuous operation of the product, but also allows the key benefits of FarmX can be perceived by the government and the market as early as possible [3].

References

[1] "FarmX Case Study", 2018.

[2] H. Drakos, "SWEN90016 - Semester 2 2018 - Lecture 2 FINAL", 2018.

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[4] S. Balaji and D. Murugaiyan, "WATEERFALLVs V-MODEL Vs AGILE: A COMPARATIVE STUDY ON SDLC", *International Journal of Information Technology and Business Management*, vol. 2, pp. 26-30, 2018.

[5] R. Winston, "Managing the development of large software systems: concepts and techniques", *the 9th international conference on Software Engineering*, pp. 328-338, 2018.

[6] K. Schwaber and M. Beedle, *Agile software development with scrum*. Upper Saddle River, NJ: Prentice Hall, 2002.

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