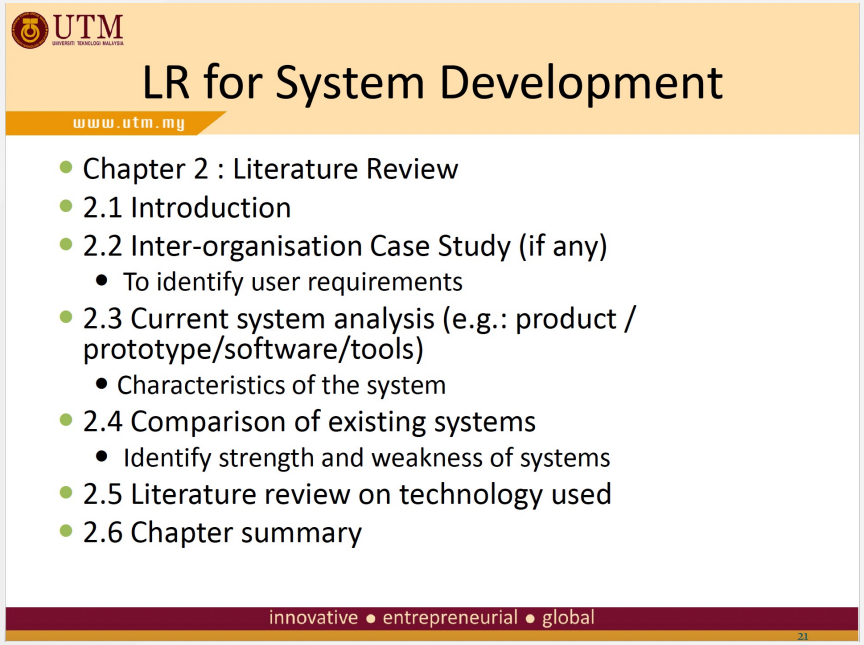
Chapter 2
Background and Related Work



More suitable structure

2.1 Introduction ← *what this chapter is about*

2.2 Inter-organisation case study ← *if you have direct stakeholder*

Or,

2.2 *Domain background, for e.g.* Climate Change, or, Food Waste and Food Security ← *if no direct stakeholders*

2.3 Current system analysis ← *what do you learn about the important features from the organisation, or, from the respondents*

2.4 Comparison of existing systems

2.5 Review on technology used

2.6 Chapter summary ← *recap what have been covered*

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How to Start the Literature Review?

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- Step 1: Study the problem domain.
  - Explain the area in which you are going to construct the project.
  - Example: What is the objective or business of the organizations
  - Organization Chart

This is to accomplish Section 2.2

You may do the above if an organisation is involved

Alternatively, elaborate on the domain involved

2.2 The importance and challenges of online community

"Persistent-pervasive community" is the community in which people nowadays have constant contact and pervasive awareness due to digital communication technologies (Keith, 2015). In other words, we are now driven to a life where the people can have the unavoidable familiarity with their companions' lives similar to the pre-industrial village but in a cutting edge setting. However, many social media platforms are introduced to serve this purpose but not in Malaysia yet. In addition, the neighborhood-targeted social media have more advantages as it can make the envisioned ideal rural local area more successful than offline ties between the neighbors alone. The reason behind it is because the offline relationship with the neighbors is just a foot away from the house (Keith & Barry, 2003), but the online relationship can increase awareness and engagement without caring about the distance. In this solemn moment, it is essential to know more about our nearby neighborhood within a distance as they are the ones who can help us during the difficulties.

difficulties which can be solved using a mobile application. Foremost, fake news is a big concern for most SP residents as it created much chaos within the SP area. For instance, the spreading of fake news related to the main reason causing the nine deaths due to the COVID-19 is the irresponsible hawkers who do not follow the SOP. However, it is verified fake news by their godson. The fake news had caused the food court to face closure issues and make the SP residents scared to buy food from outside. Hence, it is a severe problem and can be solved if we have a reliable news platform.

Next, it is the issues about managing the Facebook Group. As an experienced Facebook Group admin, the stakeholder, Mr. Goy stated that it is hard to reduce offensive posts and fake news. It is difficult for Facebook Admins to delete fake news or offensive posts as thousands of Facebook posts are posted inside the Facebook Group. In addition, the posts inside the Facebook Group consist of different categories, including the crime that happens in the neighborhood, the advertisement for the local product, the news shared by kind people, the questions asked and many. Hence, the suggestion given is to label up the posts and categories the posts. It can help the Facebook admin to manage the post quickly. Furthermore, the users can choose to watch what they want instead of spending lots of time finding the matching post.

Additionally, SP residents find it hard to get the local authorities' number since not all local authorities can be searched online. The problem frustrated the Facebook Group admin as they always received lots of private messages from the Facebook members asking the authorities' numbers. Hence, the suggestion from the stakeholders is to create a Yellow Page that can include all the authorities and their numbers. It can help the SP residents to contact the respective authorities without waiting for replies from the Facebook Group Admin.

Next, the last challenge faced by the SP residents is that the advertising inside the Facebook Group is not as good as before. The business owners can still share the products online, but the likes and comments given are less compared to before. In addition, the stakeholder also complains that some of the businesses outside the SP area also advertise inside the Facebook Group. It causes many complaints from the user as the Facebook Group admin does not filter the irrelevant posts. Hence, their suggestion for the Jiranku application is to create an SP based e-commerce platform to serve all the businesses within the SP area. It is essential as the targeting marketing can raise their sales and increase their exposure within the SP area.

2.2 Importance of Using Solar Energy

People have been introduced to solar energy a long time ago, but a lot of people have not tried using solar energy. In fact, solar cells exist for more than a hundred years and solar energy started to be known by more people in 2008 (This Month in physics history, 2009; Walton, 2015). Due to the fact that electricity generation depends on non-renewable resources and emits carbon dioxide, renewable energy such as solar energy is said to be the greener and more sustainable option to generate electricity. Colak et al. (2020) claimed the following:

> When faced with the exhaustion of non-renewable energy sources such as fossil fuels, there is a growing threat of a sharp increase in these needs. Fossil fuels, which cover a high proportion of energy needs, are known to be the source of many negative consequences such as global warming, seasonal deviations, glacier meltdown and natural disasters resulting in environmental pollution……[therefore,] alternative energy sources are being sought. (p. 1)

Apart from the good impact of solar energy on Earth and our environment, it also helps to save or reduce our electricity bills. People are active, carrying out activities during the day and all the machines and appliances depend on electricity. To meet such high demand, more electricity needs to be generated and hence there exists a schedule when people will be charged more during the peak hours, which is from 8.00 a.m. to 10.00 p.m. for Malaysia (Energy savings at work, n.d.).

Furthermore, Odetoye et al. (2022) explained that "solar energy looks relatively promising in terms of abundance, [the] ubiquity of resource, predictability/consistency of its availability, public perception, and environmental impact". Odetoye et al. (2022) also claimed that solar energy was becoming more well-known for off-grid home systems in Nigeria. Moreover, the increased use of solar energy will help to improve the economy. This is because it creates more job opportunities, for instance, solar installations and experts. Thus, an application that encourages people to use solar energy is needed in order to create a better and sustainable world.

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- Step2: Study the current system and procedure, study similar systems that are available
- Some approach can be:
  - i. Document analysis
  - ii. Interview
  - iii. Observation
  - iv. Survey

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This is to accomplish Section 2.3

i, ii, iii are suitable if an organisation is involved. The findings are reported. Usually, an as-is swimlane is produced

While ii and iv can be performed on respondents. The findings are reported.

The process of managing data in the clinic starts when the patient registers themselves to the clinic's receptionist. The patient's info about their name, age, address, IC no, and other personal information will be recorded as well as their dental problem. After the patient is done with their registration, they will be given a reservation number. The patient will be able to meet the dentist according to their number.

When the patient enters the dentist's room, they will be asked more about their dental problems and the dentist will write its details. After hearing about the patient's disease, the dentist will explain about their condition and the treatment that needed to be done. The patient is free to accept the treatment or not. If the patient accepts the treatment, the treatment will be done and the dentist will write about what treatment has been done so the receptionist will know about it. The medicine for the patient will be written in the same paper as well.

As the patient leaves the dentist's room, the paper will be brought to the receptionist by the staff of the clinic. Then the patient will wait for the receptionist to call them while the receptionist will calculate the patient's bill according to what treatment has been done to the patient and what medicine will be given to them. When the bill has been calculated, the receptionist will call the patient and tell them the amount that needs to be paid. After the patient pays the bill, they can go home if they do not require any medicine. If the patient requires medicines, then the patient will need to wait again for the medicine to be prepared and the receptionist will call them again. The overview of ANAKITA clinic workflow will be shown as diagram in figure 2.1.

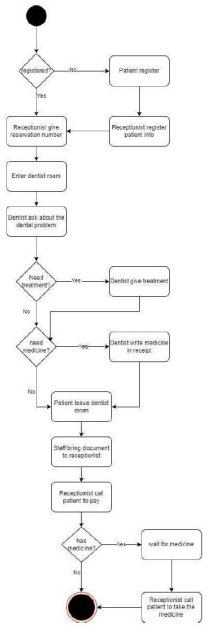

Figure 2.1: ANAKITA clinic current workflow

A survey, as attached in Appendix C, was conducted by using Google Forms to understand people's needs regarding the use of solar power as well as solar assistant applications. The results or responses were then gathered and analysed to elicit the requirements of the proposed SPAA system – SOLARE.

Based on the results of the survey as attached in Appendix D, there are 35 respondents and the majority, which is 77.1% of them, know the difference between renewable and non-renewable natural resources. With the explanation of both renewable and non-renewable energy, the vast majority (97.1%) prefer using renewable energy for generating electricity. Meanwhile, 28.6% of the respondents state that they did not know the process of generating electricity releases gasses, for instance, carbon dioxide, that could pollute the air.

Moreover, 40% of the respondents pay the electricity bills for their homes which cost RM100 to RM499 monthly. Whereas, 14.3% of them pay RM1,000 to RM3,000, which is very expensive. When asked about how well they know about solar power, 40% of them claim that they lack the knowledge, 45.7% of them possess some knowledge, and only 5.7% of them claim they know a lot about solar power.

Furthermore, more than half of the respondents, which is 57.1% of them, have thought of using solar power and 31.4% of them have also been considering it. Interestingly, the majority of the respondents (80%) never possess any solar-powered appliances, no matter big or small, at their homes or working places. Nevertheless, 82.9% of the respondents agree that solar power can help to save electricity in the long run. Plus, all of them are willing to try using solar power to tackle climate change. Hence, when asked about the reasons for them using solar power, the responses, overall, are to save electricity and the environment. One respondent also states that there are areas or places that have no electricity supply, which helps to prove the importance of solar power. Besides, they think the main reasons people not using solar power are the purchasing and installation costs, lack of knowledge about solar, and not knowing where to start. Therefore, it is crucial to introduce and provide knowledge about solar energy to society.

Regarding solar power assistant applications, the vast majority of them (97.1%) have not used any solar-power-related applications before. They also think that it will be useful to have an application that can help them to calculate the power of solar panels they need depending on the appliances they want to use. In addition, the vast majority continue to agree that it will be convenient to browse and purchase solar-related products on the same application, which they use to calculate the solar power needed. Most of them are also excited to know the Return on Investment (ROI) and their contribution to combating climate change.

In summary, the majority of the respondents are interested to try using the SPAA, which is the proposed system. The reasons are

- The respondents find the application would be helpful in guiding them and calculating the solar power needed
- The respondents would want to know their contribution in combating climate change
- The respondents are interested in Return on Investment (ROI) for solar power

Thus, SOLARE will also be designed in a way that can meet the functional requirements gathered and people's demands. A simplified Lean Canvas in Figure 4.1 shows the strategy for developing the proposed application.

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- Step 3 :Study the existing solution to the problem. For example, developing a system using RFID is chosen then the study should include:
  - Why RFID?
  - How does RFID help with solving this problem?
  - How does RFID work?
  - Identify the software and hardware required.
  - Study existing systems that uses RFID for tracking (advantages and disadvantages, limitations).

This is to accomplish Section 2.4

Based on findings from 2.2 and 2.3, typically a technological solution is set to address the recognised limitations.

Proceed to justify the reason, and identify existing systems in the market that already use the technology, or systems that are similar to what you have in mind. Normally 2-3 systems.

Come up with a comparison table. Criteria are recognized from your analysis on what are important features to provide the solutions.

Currently there are no specific systems that match the requirement that ANAKITA clinic needs to manage the clinic, since the system itself is supposed to be a customized system that synchronizes and matches with ANAKITA clinic current conditions and demands. Even though a perfect system does not exist, there are some systems that match a part of the requirements that are needed in the system that ANAKITA clinic demands. Since a part of ANAKITA clinic workflow is an appointment system whereby the patient can make an appointment with the dentist, there is an existing system that matches this criteria which is called Acuity Scheduling and Doctible.

2.3.1 Acuity Scheduling

Acuity Scheduling [2] is an appointment management system whereby the client can book their meeting with the owner of the app. Acuity scheduling has a simple and easy UI whereby the client can book through a calendar that notes the available time for the meeting. The application itself serves as an easy way for the client to either reschedule or cancel the meeting that they have made. Another good feature about the application also saves the client information so that the owner will know who makes an appointment with them, since it will make the owner cautious if someone without any information wants to meet with them. Acuity scheduling has its good and bad that can be compared to the proposed application which will be entailed below.

The strength of Acuity scheduling is that it is easy to use, i.e. it has a good UI and UX as shown in figure 2.2. The client can see when a meeting may be held and can book an appointment with the owner. It also saves their personal information to the calendar then the owner can see what the appointment will entail in the calendar. This one stop information for the owner is the best feature that acuity scheduling serves. But, acuity scheduling lacks in some aspects. The information that is being saved is temporary information that is saved to the calendar and does not have any profile.

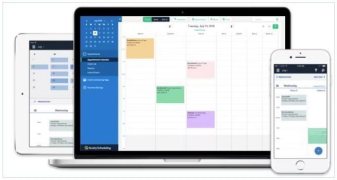

Figure 2.2: Acuity Scheduling picture

2.3.2 Doctible

Doctible [3] is a patient engagement app that a dental health care management system may use in order to attract new patients to come. Doctible serves a couple of services including patient communicator, patient reminder, virtual waiting room (figure 2.3), digital form, online scheduling, voice reminder etc.

Doctible is quite practical and easy to use with all of its features that helps both the dentist as well as the patient. Patient reminder is one of the piques of interest whereby a patient will sometimes forget about their appointment that they have made since their dental problem is not a crucial one. And this kind of event happens quite often in particular.

Overall, for an appointment managing system Doctible had quite covered most of the features needed to be implemented. The only weak point that is not covered but needed for the proposed system is the features that help the receptionist in managing the drugs and creating the invoice.

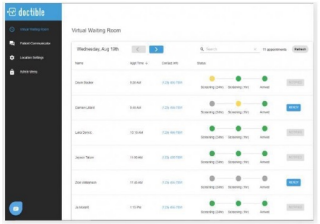

Figure 2.3: Doctible picture

[redacted] Most of the system only covers the appointment system where the patient can make the appointment to the dentist as well as cancelling the appointment.

The lack in the existing system is proof of the cruciality of the development of a dental health care management system that is customized and suits ANAKITA clinic. The importance of each feature will be discussed gradually. Dentist receipt management, as one of the requested features that need to be implemented in ANAKITA clinic, used to prevent any harm from happening to the document that must be carried out from the dentist office to the receptionist table. Those harms included getting splashed by water, torn or even lost.

Pharmacist's drug management feature plays a role in helping the receptionist to manage the drugs that are currently available in the clinic. Without this feature the receptionist must either remember the amount of the drugs that are available in store or write it down in a book. This traditional method has its own harm and takes more time and effort to do. The invoice management also acts similarly as pharmacist's drug management in helping the receptionist to manage the invoice that will be given to the patient.

Thus, the development of a dental health care management system that suits the ANAKITA clinic perfectly is highly necessary. The summary of the comparison, together with the proposed features are in the Table 2.1 below.

Table 2.1: Existing system comparison

Features	Acuity Scheduling	Doctible	Proposed Dental Health Care Management system
Patient self-appointment	√	√	√
Dentist receipt management	x	x	√
Pharmacist drug's management	x	x	√
Invoice management	x	x	√

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To accomplish Section 2.5

This section reviews the technology involved to develop the system – front end to the back end, including any third-party hardware or software involved

How to cite?

- It is highly important to refer to other existing works especially when describing matters such as the domain area, limitations, potential solutions etc.
- You need to properly cite the work and place the reference at the respective statement
- Only cite from established and legit sources. Wikipedia is a NO
- Never copy and paste as this is regarded as plagiarism. Rephrase using your own words.
- Format to cite (references format) will be discussed in other session