MOBI PARKING NAVIGATOR SYSTEM

(COST ESTIMATION)

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Abstract

The peoples in UMP consist of staff and students. They come to UMP using their own vehicle and they need a parking space to park their car when they are in the class or office. This shows that the parking spaces in UMP are very important. The Mobi Parking Navigator System (MPNS) will help the user to find the nearest parking spot to their intended location. Since the MPNS is a new system, it needs help from different system to persuade the owner of the parking area to use the MPNS system. In order to convince the owner of the parking space, the MPNS (Cost Estimation) will show the potential customer the cost needed to implement the MPNS. The costs are generated from the device that will be used for MPNS.

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Chapter 1

Introduction

1.1 Introduction

Nowadays, vehicle such as car, van, MPV and many more are an essential need for our daily life. That is why, every family at least need to have one vehicle. The usage of vehicle is very convenient because it is a tool that helps to transport the user from one place to another. Although it is very convenient, there always one problem can occur and that is to find a parking space to park the vehicle. In order to find a parking space that fulfills the user needs such as near the entrance, sometimes the user had to circle the area many time just to find the parking space. This situation could happen in many places such as at the shopping complex or working places especially during the peak hour. This situation also occurred in University Malaysia Pahang (UMP).

In UMP, the user of a vehicle can be divided into three groups that is staff, students and outsider or guest. The majority user of vehicle in UMP comes from the group staff and students. Base on the groups, the parking space in UMP also had been divided according to the groups. Because of that, the parking space that available in UMP had been assign to its own category. The problems that occur in UMP are the numbers of parking space are not that great compare to the number of user. User will find difficulties in finding an available parking space during the peak hour. UMP also use the manual parking system that is the user need to find a free parking space on its own and the category of parking space are shown on the sign board at the area.

Mobi Parking Navigator System (MPNS) is a system that will help the user to find an available parking space at the place where the system is installed. It helps the user by showing the available parking space at the area throughout their mobi device such as smart phone and iPad. This will help the user to plan their movement in order to save their time

from circling around the area to find an available parking space. By having this system install in UMP, it will help the problem faced in UMP especially during the peak hour.

Before the system can be fully install and use, it will need a device or system that will simulate the cost needed to install the system in UMP. The device or system must able to calculate the cost base on the item needed by the MPNS. This is to help the management of installing MPNS by estimate the total budget needed. After that, we can give an appropriate price to the customer of potential customer base on the estimate budget.

1.2 Problem Statement

The aim of this project is to develop a system that can stimulate the estimate cost need to install MPNS at the designated place base on it requirement. The system will help user in managing before installing MPNS at targeted place. There are a lot of things that need to be reconsider before the installing the MPNS such as the number of item need, type of parking area and many more.

Since MPNS is a new system, it required more attention on the management before it can be fully implemented. During that period of time, it need to considered all the device, cost of the device base on the criteria of the parking space. These processes consume a lot of time because the user need to calculate manually and it is prompt to error. By having the system, the user just need to enter all the data and it will made the calculation automatically.

1.3 Motivation

One of the motivations of this project is to produce a much easier way of finding an available parking space for driver. This can save the time by reducing the time of searching the parking space. The other motive is to help developer in making decision before implementing this system in the area. This can be done by showing the cost estimation of installing the system in the designated area. This will surely help the potential user of MPNS to plan their budget.

1.4 Objective

The objectives of this project are:

   i.   To implement technic used to generate cost estimation of installing the MPNS.
  ii.   To design the interface and database for the cost estimation systems.
 iii.   To develop the system that can generate the estimation cost and manage the device information used by MPNS.

1.5 Project Scope

The scopes of the project are:

   i.   This system comes with system administrator, to control the content of the system.
  ii.   Another user of this system is the client. The client is the owner of the parking are who want to install the Mobi Parking Navigator System.
 iii.   The targeted parking space is the parking space in front of Faculty of Computer System & Software Engineering.
 iv.   Technique use is estimating cost technique.

1.6 Methodology

Methodology is a planned steps or process to accomplish a goal. There are lot types of methodology that can be use but not all the methodology can be used in a project. Some project required it own methodology. The components that will be used in the methodology of this project are requirement analyst, design, implementation, testing and evaluation.
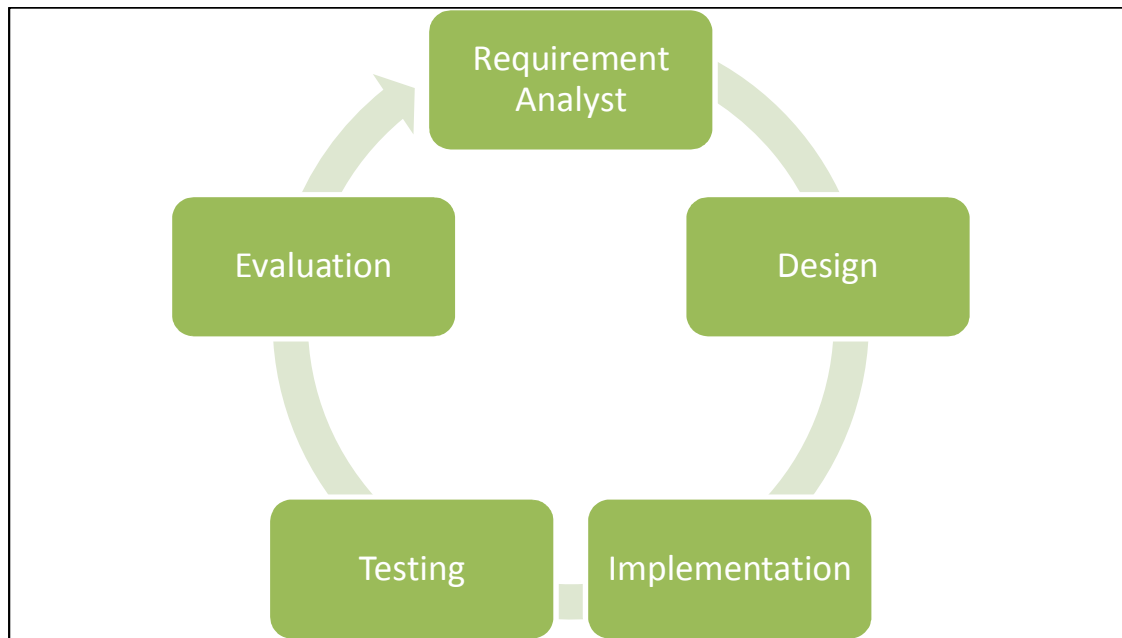

Figure 1.6.1 : Software Development Life Cycle (SDLC)

Figure 1.6.1 shows the SDLC that will use for the project. The SDLC contain five phase, and they are requirement analyst, design, implementation, testing and evaluation. During the requirement analyst phase, all information needed to develop the system are gathered and analyst. Some of the information that needed to gather is the type of parking area, list of device needed, price of device, and many more. The information are gathered by observation and survey through the internet.

The second phase in the SDLC is design. Here, the design of the system will be made base on the information gather from the requirement analyst. The design will provide a user friendly interface so that the user can use the system easily. After the designs of the system are finished, the design will be implemented in the implementation phase. The implementation will be done by using the software and hardware that had been decided.

After that, the system will be sent to the testing phase. This is where the system will be tested to see whether the system fulfill the requirement or not. Not only that, the system will also be tested to check whether there any error or not. After that, the system will be evaluate in the evaluation phase. Here the system will be evaluating base on the result of the testing phase and the objective of the system. Then the system will be sent back to the first phase in order to analyst for enhancement.

1.7 Thesis Organization

The thesis consists of four chapters and the tittles for each chapter are as follows:

- Chapter 1: Introduction.
- Chapter 2: Literature Review
- Chapter 3; Propose Work
- Chapter 4: Implementation
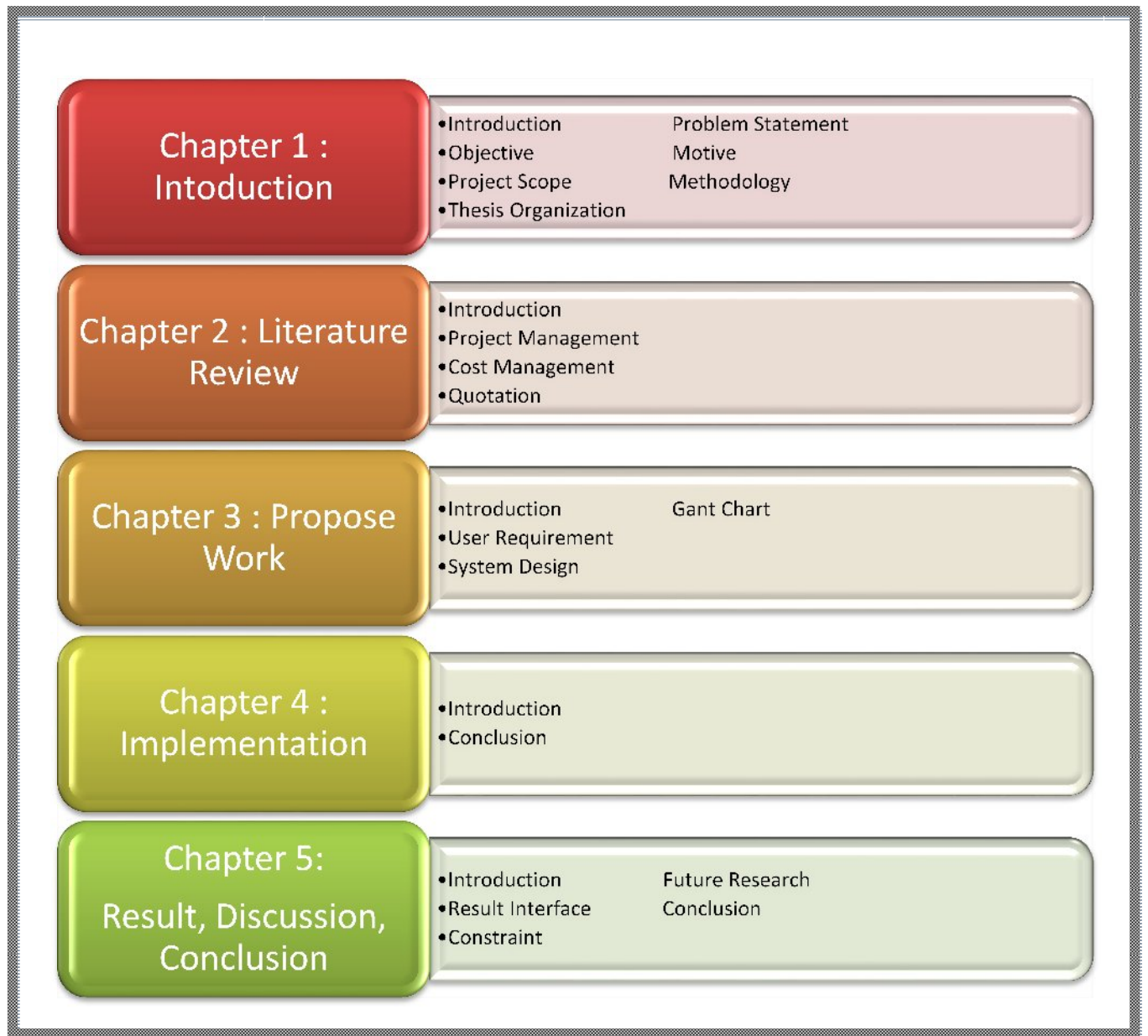- Chapter 5: Result, Discussion, Conclusion

Chapter 1 : Intoduction	•Introduction Problem Statement •Objective Motive •Project Scope Methodology •Thesis Organization
Chapter 2 : Literature Review	•Introduction •Project Management •Cost Management •Quotation
Chapter 3 : Propose Work	•Introduction Gant Chart •User Requirement •System Design
Chapter 4 : Implementation	•Introduction •Conclusion
Chapter 5: Result, Discussion, Conclusion	•Introduction Future Research •Result Interface Conclusion •Constraint

Figure 1.5.1 : Thesis Organization

The figure above shows the thesis organization of this paper. It also shows the main content of each chapter for the thesis organization.

<div align="center">**Chapter 2**</div>

<div align="center">**Literature Review**</div>

2.1 Introduction

Here, the chapter will explain about the existing system that being used in market and give explanations about the existing process or technique or methods that could be used for the system.
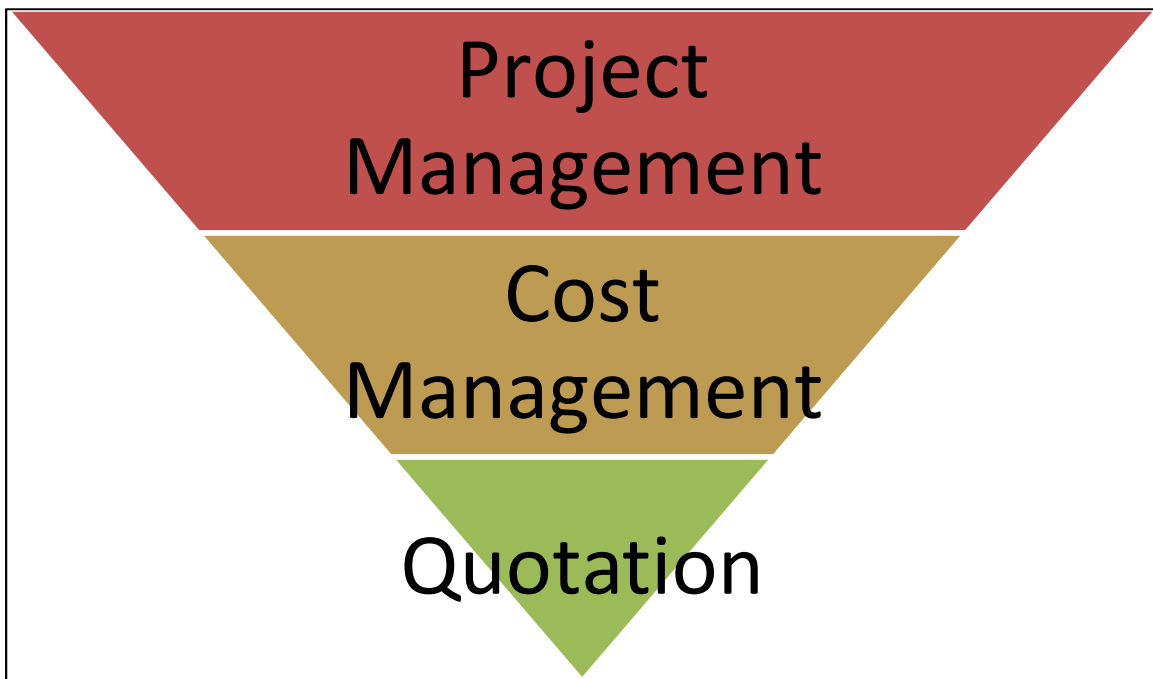

<div align="center">Figure 2.1.1: Theoretical Frame Work</div>

The figure above shows the theoretical frame work that will be discussed in this chapter. The theoretical frame work start with project management and follow with cost management and lastly about quotation. Basically, we will discuss how the theoretical frames work related with the development of this system.

2.2 Project Management

Project management had existed since the ancient time. This is because a project is something that we plan to do to achieve a certain goals. For example, the goal is to make a birthday cake and the fore the project will be about making a birthday cake. Hence, project management is all the process takes to make sure that the aim of the project is achieved. Not only have that, project management covered all aspect that required achieving the goal.

Along with the flow of time, project management has evolved from scheduling into planning, coordinating, control the complex and diverse activity and anything that related with the project. Before 1980, project management is focused on providing schedule and resource data to top management in the military, computer and construction industries [1]. Nowadays, project management involves all sorts of people that involve in any kind of project.

As mention earlier, the used of project management has expand to any project that being done by individual or an organization. This is because project management gave a lot of advantage to the person or the organization whose use project management technique to deliver their project.

The following are some of the advantages of using a project management:

- Better control in term of financial, physical, the human resource.
- It will improve relationship with the customer
- Save development times.
- Lower cost
- Improve productivity
- Higher quality
- Increase reliability
- Higher profit margins
- Better internal coordination
- Positive impact on meeting strategic goals.

2.2.1 Project Management Knowledge Area.

Every process have their own main component and there also no exceptional for project management. These components are also known as project management knowledge area.
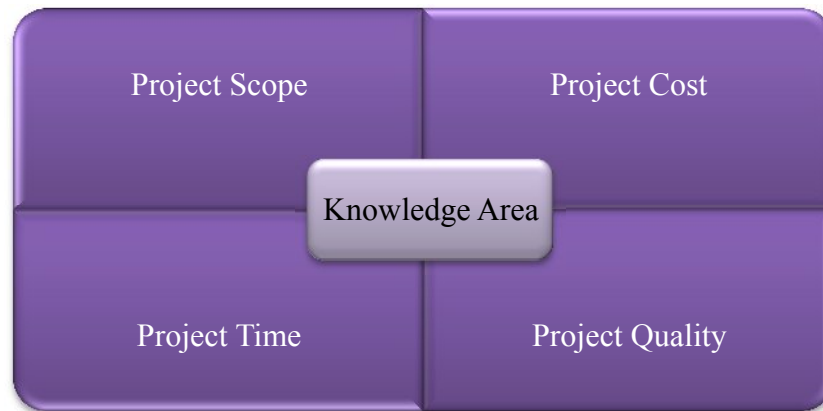

Figure 2.2.1.1 : Core Knowledge Area

There are actually nine knowledge area and they are scope, cost, time, quality, human resource, communications, risk, and procurement. The figure above shows four core knowledge area of project management. The project scope focuses on managing and defining all the work that required in order to successfully completing the project [1]. The project time are mainly about estimating the time taken to complete the work, make the schedule, and ensuring timely completion of the project [1]. The project cost management need to prepare and manage the budget for the entire project [1]. The quality management need to ensure that the project will satisfy the stated or implied needs for which it was undertaken [1].

2.3 Cost Management

As mentioned before this, the cost management needs to prepare and manage the budget for the entire network [1]. Here, the cost covers from sophisticated to the non-existent cost [2]. Every project has its own value, and sometimes the value of the project can be measured by the cost of the project. For example, a great or big project tend to have a large cost. In cost management, there are four components to it and they are estimating cost, tracking cost, controlling cost and maintaining cost data [2].

Estimating cost is a process where the cost of the project being determined or predicted. There are a lot of techniques that can be used to make the cost estimation such as making an estimation base on the previous project or any similar project. The other way to make an estimation of the cost of the project are from listing the price of the component that going to used in the project, payment for human labor, and many more. From here, the person in charge of the project can proceed with more ease. Not only that, the person in charge will know the total amount of money needed for the project.

Tracking cost also an important phase in cost management. Here, every cash flow for the project needed to be record and monitored. This is very important to ensure that the spending of the money for the project is not wasted. Not only that, it is also to make sure that the money is used to what it is intended to do so. In order to track their cost, every person that involve in the project play a role in it.

All things in a project management needed to be control to ensure the successful of the project and there is no exceptional for the cost. The main purpose of cost control is to make sure that the cost of the project does not exceed the cost intended for the project. This is because a project that surpasses their intended cost could be considered a bad project. Thus, a project that can minimize their cost could be considered as a good project because it does not waste their money.

After completing the project, the cost data needed to be maintained for future purpose. The data can be used to make a new estimation of cost for other network [2]. Not only that, the data could also help in improving the new system.

2.3.1 Cost Estimation Approaches.

Cost estimation technique can be classified into two and they are qualitative and quantitative [6]. The technique that used the past historical cost data and expert experience to make the estimation is the qualitative technique [6]. Although the past historical project information can help in making estimation, there still some difficulties occur when doing it. The first difficulties while making an estimation base on previous project are the degree of similarity is difficult to measure and heavily influenced by subjectivity and the second one are the impact on project cost of change in external environmental factors and updates to technological process cannot be adequately considered [6]. Despite all of it weakness, it is still useful for an experienced users.

The quantitative techniques used the previous data, expert knowledge and analyze the project design, processes, and distinctive attributes.[6]. This is to made an appropriate cost base on all the cost related to the project such as the resource cost and other cost. Although this technique could produce an approximate cost but it consume a lot of time by gathering sufficient data and information about the project. An example of quantitative technique in cost estimation is the probabilistic estimation method (PEM).

2.3.2 Probabilistic Estimation Method

Nowadays, risk analysis has been a key add in value in making cost estimation. This is because projects are expose to many uncertainty during the initial stages, and decision behavior of project personnel are also misdirected. Recently, PEM has been used to generate a range of project cost and project risk [6]. Monte Carlo Simulation (MCS) is one of the simulations that used the PEM.
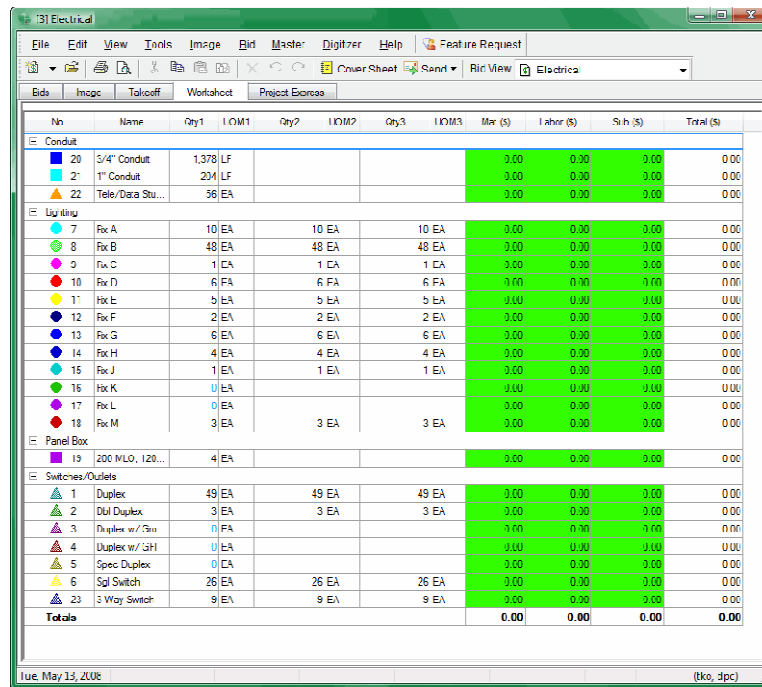
2.3.3 Analytical Technique (Bottom-up Estimate)

This technique use easy calculation to estimate cost from the decomposition of the work into manageable tasks, operations or activities. It is base on activity-based costing system that focus on calculating the cost assumed on performing the activities [5].

2.3.4 Artificial Intelligence Technique (AI)

AI plays an important role in cost estimating process because it need a considerable effort to realize the effectiveness by validating the computing outcomes. AI has been used widely for cost estimation in the disciplines of construction industry, manufacture sectors, computer and software engineering, process industry, concurrent engineering, research and development management, and product development. Artificial Neural Network (ANN) is an example of AI technique and it is a feasible alternative for early cost prediction owing to its ability to model complex systems given a minimal amount of data input.

2.3.5 On-Screen Professional Software

Figure 2.3.5.1 : On Screen TakeOff Electrical Floor Image Tab

The software is popular with the contractor from North America and Europe. On-Screen Takeoff includes both a takeoff and an estimating application that can be used by commercial contractors. It involved in design and builds that cover electrical and teledata, general contractors, roofing & siding, and finishing trades. The takeoff application includes onscreen takeoff, digitizer integration, CAD file integration, and 2D takeoff. Meanwhile, the estimating application includes Excel integration and a cost database that is updated regularly. The figure above shows the electrical floor image tab. These features allow for firms to streamline the takeoff process. The system is also compatible with a Digital Takeoff Table that will allow for hand tracing so drawing does not have to be performed via a mouse. This is a good program but the only problem that the user gains from using the software are related to money. The user must pay the maintenance fee in order to get any update for the software.

2.3.6 ProEst Estimating Software

Figure 2.3.6.1 : ProEst Estimation Software

The figure above show the ProEst Estimation software. ProEst Estimating & Takeoff Software combines cost estimating, digital takeoffs, and bid day analysis in a single solution. It is uses the MicrosoftSQL database, a .NET development platform, and Windows 8 compatibility. The user interface for the system has a standardized Microsoft Office look-and-feel that lessens the learning curve. ProEst includes a comprehensive materials database, visual assemblies, and support for cost update services like RS Means, Trade Service, All Priser, and MCAA's WebLems. ProEst integrates with many construction accounting and project management systems to streamline job setup and management.

2.3.7 Quote Express Piping & Sheet Metal Software

Figure 2.3.2.3.1: Quote Express Mobile Takeoff

This software was build to fulfill the unique needs of piping, plumbing and ductwork contractor. It offer a simple, effective way to create consistently accurate estimates, bid more jobs and more effective way of managing projects. Not only that, it also had a Quote Express Mobile Takeoff as shown in the above figure. The mobile application allows users in the field to add lists of pipe, ductwork and other accessories from their mobile device. Whit this, there will be no more faxing, call-ins or other error prone ways to get the data to office.

2.4 Quotation

Quotation have a lot of meaning and this is depend on how the word is used. In Cambridge dictionary itself, the word quotation have three meaning in a different perspective. In perspective of said, it bring a meaning of a phase or short piece of writing taken from a longer work of literature, poetry, any form of documentation, or what someone else had said [7]. While in perspective of price, the meaning are the price that a person says they will charge to do a piece of work [7]. The last perspective is on perspective of shares, the definition is the fact that a company shares are being traded on a particular stock market [7].

In this document the quotation that are focus on a perspective of price. This is because the project are focus on cost management. This quotation is used to give the estimation cost of installing the MPNS to the potential parking provider before they can decide whether to use it or beside that.

Chapter 3:

Propose Work

3.1 Introduction

This chapter will discuss about the purpose work for the system. it is the same as discussion about the design of the system. Hence, this chapter will cover from user requirements until the design of the systems.

3.2 User Requirements

The user of this system consists of the admin and the client. The admin will be the one that will control the content if the system. The client for the system is the potential customer who interested to use the MPNS in their parking space.

The administrator wills admin the content of the system that consist of the list and information about the component or device that will be used in MPNS. Those information needed to be update consistently especially the price of every device. This is to ensure that the estimation are accurate. Not only that, here the admin can view any request for quotation had been made by the potential customer base on the estimation the system had done.

The client side function for the system is to generate the cost estimation base on the information entered by the client through the system. The estimation are made base on the number of devices that will be used by MPNS. The number of device are calculate by using the information the client had entered. After that the client can choose to continue to request a quotation or not.

3.2.1 Type of Information Needed

In order for this system to process with the cost estimation, it needed some information to make it the base of the process. The information needs are the entire device that will be used for MPNS. Here, the device information is not just about the type of device or the device name only, the system require the price of the device in order to make the estimate cost.

The information of the client are also needed. This is for the request of quotation. Every client that proceed to request for quotation after view the estimation cost need to give their information in order for the admin contact to further discuss about using the MPNS on the client parking space.

3.2.2 Hardware & Software

Below are the hardware & software that will be used to develop the system:

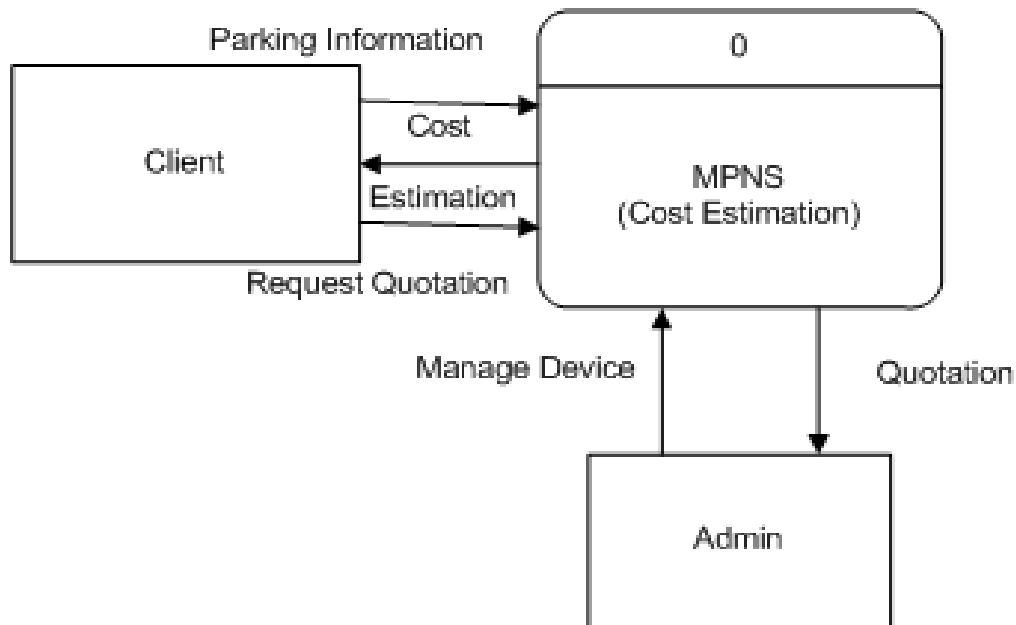| Device & Tools	Description
Laptop	It is used to develop the system
Adobe Dreaweaver CS6	It is used to develop the system
XAMP	Software for database server
PHP	Programming Language Used to development
HTML	Programming Language Used to development

3.3 System Design

Figure 3.3.1: System Flow

Figure 3.3.1 show the system flow for the system. Here, shows a more simply version of the user requirement of the system. The system user consists of the admin and the client. The admin task is to update all the information in the system. The client is the person who used the system to watch the estimation cost of installing the system in the parking space and request for quotation.

From the information that been given to the system, it will process the estimation cost base on the number of device will be used and how it will be implement in the parking area. After the user had seen the estimate cost, then the user can proceed with request for quotation or not.
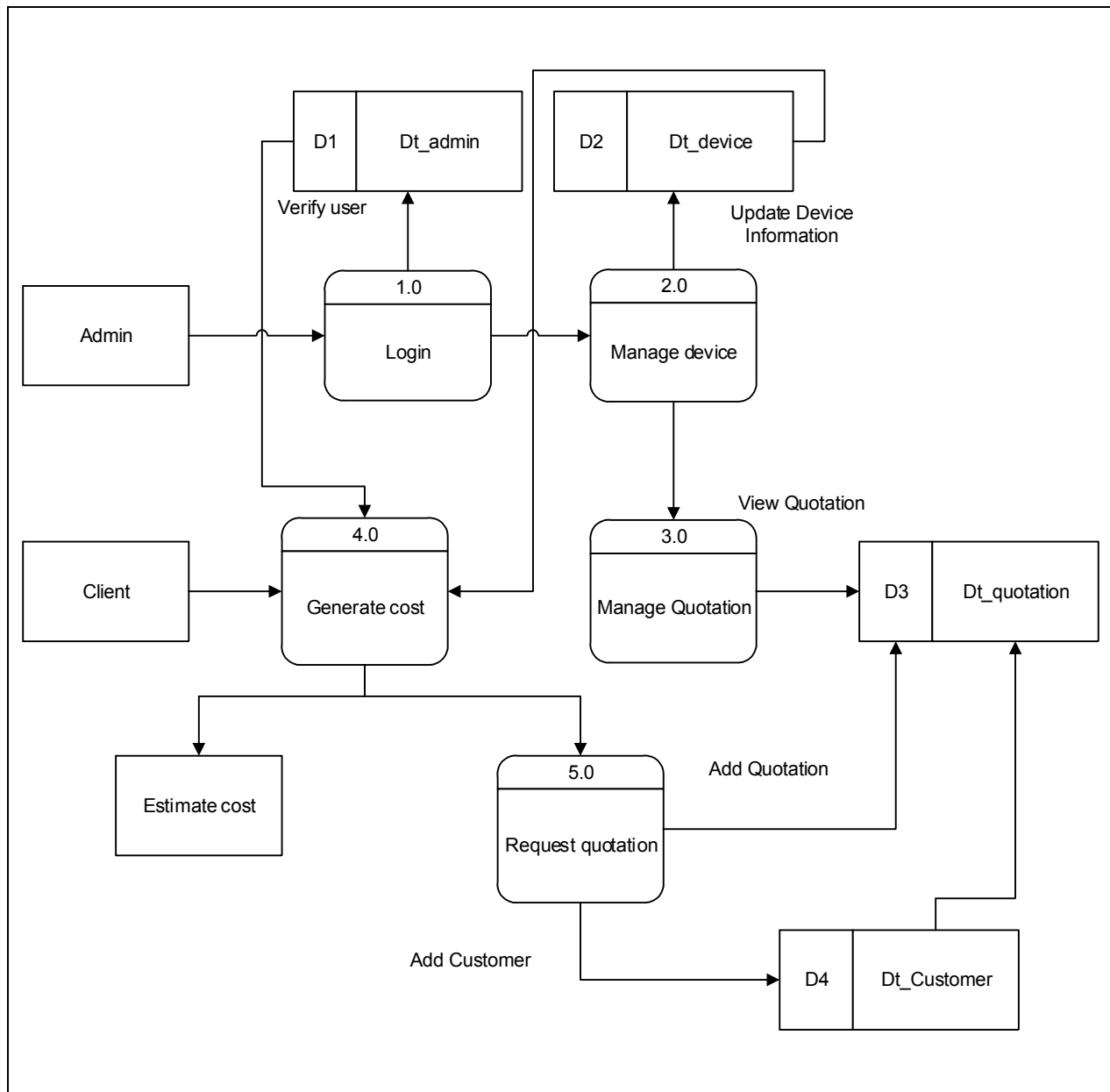
Figure 3.3.2: Data Flow Diagram (DFD) Level 0

The figure above shows the data flow diagram (DFD) for the system at level zero. From here, the system will have five modules and on each module have their own task. Each of the module task will be shown on other DFD figure.