CHAPTER 2: PLANNING

2.1 Introduction

This chapter focuses on the planning phase of this project. It will start by identifying the business value of the project to GSTOA. Feasibility analysis will be carried to identify if the project is technically, economically, social and operationally feasible. Risk and stakeholder analysis will also be carried out. If the project proves to be feasible and proves to be valuable to the business with little risk on the business a work plan shall be developed.

2.2 Business Value

In management, business value is defined as the forms of value that determine the well-being of an organisation in the long run. (Loudon, 2005).

The business value that GSTOA will benefit from the project are

Quality service provision

Transparency

Fairness

Customer care

Innovation

Efficiency

2.3 Feasibility Analysis

Feasibility analysis is also known as software requirements analysis. It investigates the feasibility of a certain idea, invention, innovation or project in an environment. (Loudon, 2005). The goal of carrying out a feasibility analysis when carrying out a project is to determine if an organisation is capable of carrying out the project without major problems. Project needs can also be identified from carrying out a feasibility analysis. The feasibility of this project will be carried out in classifications of technical feasibility, economic feasibility, social feasibility and operational feasibility.

2.3.1 Technical Feasibility

Technical feasibility deals with identifying and analysing different equipment, that is hardware and software, necessary for a project implementation. Below are the technical requirements for the project and are classified in different categories.

2.3.1.1 Hardware Components and Software Requirements

Item	Specifications	Cost for 20 vehicles (US$)
Vehicle Tracking Device		
Voltage Sensor		140.00
GSM Module		400.00
GPS Module		1,000.00
Arduino Microcontroller		800.00
AVR Adapter		400.00
Charging System		400.00
Fare Collection Device		
Wi-Fi Module		400.00
Display Screen		1,000.00
Microcontroller Board		800.00
LED Lights		300.00
Charging System		800.00
Total		**6,040.00**

Table 2.1 Hardware device components

2.3.1.2 Web Application Needs

Item	Specifications	Cost (US$)
Development Tools		
PHP 7	Open Source Software	-
MySQL 8.0	Open Source Software	-
Apache	Open Source Software	-
Google Maps Interface API	The google mapping interface application programming interface (API) is paid annually	100.00
Web Hosting		
Web Hosting Fees	Annual web hosting contract	200.00
FileZilla	Open Source Software	-
Web browser	Open Source Software	-
Domain Names	(sirika.co.zw, sirika.com, sirika.org, sirika.io, siria.net,)	98.00
SMS Gateway API		1500.00
Total		**1898.00**

Table 2.2 Web application needs

GSTOA member operators found the hardware devices total costs affordable, therefore the project is technically feasible with no financial strain on the operators.

2.3.2 Economic Feasibility

Economic feasibility is the evaluation of how profitable a project is. (Stephens 2005). It outlines the benefits of a project and aims to put a monetary value on the benefits as well as outlining the costs and putting a monetary value on the costs. The values are used to determine the profitability of a project. The economic feasibility analysis for this project shall be carried by making use of the Cost Benefit Analysis (CBA) and Return on Investment (ROI) metric.

2.3.2.1 Cost Benefit Analysis

The CBA is a ratio of the total project costs to the total project benefits.

Costs

Cost Item	Description	Amount (US$)
Hardware components costs	From Table 2.1	6,040.00
Web Application Costs	From Table 2.2	1898.00
Installation Costs	Device installation, Member cards printing and web deployment	5,000.00
Training Costs		300.00
Marketing Costs		1,000.00
Operational Costs	Hardware Maintenance	500.00
	Web Application Hosting	200.00
	Web Application Maintenance	1,200.00
	Travelling Cards	1,000.00
	SMS Gateway API	1,000.00
Total Costs		**16,138.00**

Table 2.3 Costs

Benefits

A benefit is the profit or gain obtained from something. Projects are carried out to bring benefits to organisations. Benefits can be classified as either tangible or intangible. Tangible benefits can be measured whilst intangible benefits cannot be measured. This project has the following benefits

Tangible Benefits

Tangible Benefit	Value (US$)
Reduced Printing and Stationery Cost	2,250.00
Reduction in revenue loss by staff	3,500.00
Increased customer base	1,000.00
Total	6,750.00

Table 2.4 Tangible Benefits

Intangible Benefits

Client satisfaction

Transparency in business operations

Improved customer service

Fairness

2.3.2.2 Return on Investment (ROI)

ROI is the ratio of the net profit to the total investment resulting from a project. A high ROI means the profits of an investment are high and thus a good investment. (Pearce, 2015)

$$ROI = \frac{total\ benefits - total\ costs}{total\ costs} * 100$$

Year	Total Benefits (US$)	Total Costs (US$)	ROI (%)
2018	6,750.00	18,138.00	-62.79
2019	7,000.00	5798	20.73
2020	7,200.00	5798	24.18
2021	7,400.00	5798	27.63
2022	7,400.00	5798	27.63

Table 2.4 Return on Investment

The project's ROI is only negative in the first year due to the high development and installation costs of the fare collection device. In the following years, there is a very high return on investment resulting from the benefits of implementing the project.

2.3.3 Social Feasibility

Social feasibility is one of the feasibility studies where the acceptance of the stakeholders is considered regarding the project implementation (Dhakal, 2016). It focuses on the social impacts of the project implementation to the project stakeholders. The project stakeholders in this project are passengers, transport operators or fleet managers, the driver and the conductor. The project provides transparency between these stakeholders. The transport operator can in real time be aware of the passengers in the bus, whereas the passenger pays the designated amount according to the distance he/she was in the bus. There is also a decreased workload to the conductor as there will no longer be manual ticketing of passengers. Therefore, the project will be socially feasible.

2.3.4 Operational Feasibility

Operational feasibility is a critical software engineering practice applied in feasibility studies to determine whether a newly developed system integrates well with the existing infrastructure. The AFC device can be easily attached to the vehicle inside the dashboard. The web application is built on the latest technology and best suitable for hosting.

2.4 Risk Analysis

Risk analysis is a study of the risk factors associated with a particular entity or event or action to a software project (Rouse, 2009). It is a very important aspect of risk management. The risks

associated with this project are namely reluctance to adopting technology, computer skills illiteracy, unreliable network and cyber security fears.

Reluctance to adopt technology

End users may not be liking the adoption of the project innovation as it will not exactly be how they are used to conducting their work. This may be due to fear of technology or that they know how to manipulate the current system for self-benefit. This problem can be solved by user involvement in the development stages to ensure that the users know what to expect from the system.

Computer skills illiteracy

The system users at both ends might not have the required skill sets to operate the system. The solution to this will be an investment in user training and making sure the user fully understands computer systems.

Cyber Security Fears

The system will contain data on many vehicle operations and a cyber-attack can leak this data and that will pose many security threats. It is therefore necessary to enforce cyber security protection measures to protect the system from potential threats and attacks.

2.5 Stakeholder Analysis

Stakeholder analysis is the identification and close study of the stakeholders of a project. (Stephens 2005). Stakeholders are entities or individuals affected by the implementation of a project. It is important to carry out a stakeholder analysis so as to identify the risks that may come from the stakeholders.

Transport Operators

This is the group of minibus owners or their fleet managers. They are at the centre of the Gweru Shurugwi Transport Operators Association as they are the key members of the association. The risk associated with these stakeholders is if they may not choose to accept this idea as they are the ones who choose to have the device to their cars or not.

Staff

These are the drivers and conductors working on the ground with the minibus. After installation of the device they are the ones who work with the device. Staff can choose not to market the innovation properly in a bid to sabotage it as the deice sabotages how they are used to operate. Transport operators have to therefore enforce policies and mandates in implementing the system. The staff also has to be properly trained and equipped with the necessary computer skills so they will not have much challenge using the system.

Passengers

Passengers are the minibus customers and potential customers. Acceptance of the system by passengers is a big issue. Marketing is therefore essential to better inform the passenger on the benefits of the project implementation.

2.6 Work Plan

This is a detailed plan of how a group or an individual proposes to achieve a certain goal or to accomplish a certain goal (softwareprojects.com, 2016). The Gantt chart is one of the best method to employ in laying out project activities and time taken for each topic in managing projects. The Gantt chart for this project is as represented below.

Time in weeks / Activity	1	2	3	4	5	6	7	8	9	10	11	12
Introduction	▓	▓										
Planning			▓	▓								
Analysis					▓	▓	▓					
Design								▓	▓	▓		
Implementation											▓	▓
Documentation	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓

Table 2.5 Gantt Chart

2.7 Conclusion

This chapter has focused on the planning stage of the project. The business values of the project were identified and some feasibility analysis carried out which proved that the project is feasible. Risk and stakeholder analysis were carried out and a work plan was developed through the use of a Gantt Chart. The next chapter will entail an analysis of the current system in use.

References

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