**RESEARCH PROPOSAL ON MOBILE AUTO MECHANIC FINDER SYSTEM**

**BY**

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# CHAPTER 3 METHODOLOGY

## 3.1 INTRODUCTION

This chapter present the discussion on the research methodology of the study, the subjects, sampling techniques, research instruments, procedure of data gathering and statistical treatment that will be used for accurate data analysis and interpretation.

## 3.2 METHODS OF RESEARCH USED:

The descriptive, survey and experimental methods of research will be use in this study. Descriptive because it main concern is to get the view of the characteristic of the subject exposed to the motorist when their car breakdown on roads as well as those on board.

This study is also experimental because we are going to compare between the previously developed web base application and the mobile based application called mechanic finder in relation to their performance. Both qualitative and quantitative research shall be observed as it will elicit opinions and numerical data from the respondent through survey and questionnaire.

## 3.3 SAMPLING TECHNIQUES

Convenience sampling will be utilized in this research. Clustered sampling will be used in this research because the entire population will be divided into subgroups which are randomly selected to be included in the study. Cluster is usually already defined. Cluster sampling is more efficient that simple random sampling, especially where a study takes a place over a wide geographical region, this is because it easier to contact a lots of individuals in a few GP practices than individual in many different GP practices. **Cochran, W. G. (1977).**

## 3.4 RESEARCH INSTRUMENTS;

In this research I will used only two research tools to obtain data from the respondent.

### 3.4.1 SURVEY

A survey instrument is a tool for consistently implementing a scientific protocol for obtaining data from respondents, the instruments will involve a questionnaire that provides a script for presenting a standard set of questions and responses options to the respondents. This survey will involve questions that address a specific study and the what may be done to resolve the problem and the questionnaire responses should be augmented by other kinds of measurements derived from the instrument.

### 3.4.2 APPLIED

Applied research instrument involves questionnaire, interviews and observation. This tool will be maximized in this research to collect a curate data from the population. From this research apart from questionnaire, interviews and the observation will be imposed to collect data from the respondent. Interviews though is expensive but it will provide an accurate data since it is easier to know if the person is lying or not. I will also use an observation to see by myself at a distance what people are undergoing and take note of the same to come up with a well-defined data to help solve the issue once and for all.

## **3.5 PROCEDURES OF DATA GATHERING**

Data gathering is a procedure of collecting data from the participants, this is the most vital and important part of any study carried out to resolve a specific problem. In this study I will actually use survey since the study is all about the entire nation and taking interviews will be a bit of problematic to me. Survey actually involves development of questionnaires, observation and focus groups. From this survey I will actually set on questionnaire. Qualitative questionnaire will do well in this study since the questions are analysed and they involve discussions and critical analyses without use of numbers and calculation. Computer based questionnaire will be used in this study because it is efficient and less time consuming and above all it will enable me to collect a lot of data across the entire population of my study. **Barber L B (2008).**

### 3.5.1 CONSTRUCTION OF THE QUESTIONNAIRE

Work as a partner; aligning research theme with the client’s overall business objectives to outcomes will complement the communication strategy, by doing this I will begin to craft the concept, timing and desired findings. **Ricco Wang (October 24 2014).**

To keep it simple; I will write short, simple specific question using as few words as possible. To capture the respondent actual belief, it’s best I write a clear statement that can be responded to without too much deliberation since the more instinctual reaction you receive, the better.

Choose the best delivery method; today surveys can be developed over the computer, in person, on the phone or by email. Looking at the postal survey it can be cheap but responses can be slow. face to face can be expensive but will generate the fullest responses. web survey can be cost-effective, but inconsistent with responses rates.

Be selective from the start. Sometimes you may feel a person is the right one to take the survey, it is best to ask a series of screening questions to make sure you have the right person taking the questionnaire. I will position those questions at the beginning so that I may not waste anyone’s time. Examples education and the geography etc.

Pilot the questionnaire. By testing the survey with a small population, you will determine if it’s set to do what you need it to do. This soft launch will enable you to determine whether some questions may need to paraphrased, reordered or removed. **Ricco Wang (October 24 2014).**

### 3.5.2 QUESTIONNAIRE VALIDATION

Generally speaking, the first step in validating the survey is to **establish face validity**. There are two important steps in this process. The first one is to have expert or the people who understands your topic read through your questionnaire. they should evaluate whether the questions are effectively captured on the topic under discussion. Secondly check your survey for common error like double-barrelled, confusing and leading questions**. Smith, B. H. (1997).**

**Pilot test the survey** on subsets of your intended population. Recommendation on sample size vary. Some academician says that 20 participants per questions. This actually means if I have 30 questions, I need 600 participants. therefore, I deduced that the more the participants the better. **Smith, B. H. (1997).**

**Enter the response into a spreadsheet and clean the data**. Here is an important tip, one person should read the data while the other one enter the data, after entering the data you will need to reverse the code negatively phrased questions. When used sparingly, negatively phrased question can be very useful for checking whether participants filled out the survey in a reckless fashion. If they read the question carefully their responses to negatively phrased question should be consistent.

**Identify underlying components using principal component analysis(PCA).** Component or factor loading, as they are sometimes called, will tell you what factors are being measured by your questions. Questions that measure the same thing should load into the same factors. Factor loading range from -1. 0 to 1.0. when grouping factor loading I will look for values that are 0.60 or higher, although this varies depending on what the rest of the loading look likes. If you will identify 3 factor-themes, you can be assured that your survey is at least measuring three things. Validity is measuring what you purport to be measuring.

**Checking the internal consistency of questions loading onto the same factors**. This step basically checks the correlation between questions loading onto the same factor. It is a measure of reliability in that it checks whether the responses are consistent. A standard test of internal consistency is Cronbach’s Alpha (CA). CA values range from 0-10. In most cases the value should be at least 0.70 or higher.

**Revising the survey based on information gleaned from the PCA and CA**. I will consider that even though a question does not adequately load onto a factor, I will retain it because it is important. I will always analyse it separately. if the survey undergoes minor changes it is probably ready to go and if there are the major changes I may want to make, I should repeat the pilot testing process. Pilot testing is warranted whenever you start with many more questions than are included in the final versions. **Smith, B. H. (1997).**

### 3.5.3 SURVEY DISTRIBUTION(QUESTIONNAIRE)

Survey distributions tool that allows the researcher to easily reach to his/her selected audiences, ask range of questions, analyse data in real time and make quick informed decisions. The following are the survey methods that I will used in this research to gather information from the respondent. **Cole, S. T. (2005).**

**Websites (link, pop-up, embedding).** I will try to embed the link to the questionnaire on the site, to the related web site of auto mechanic sites.to generate attention for online survey I will launch a pop-up to encourage participation, however I will remember to let user reject the invitation to respond if they are not interested.

**Email invites.** delivery by emails is quick and easy, it means that I will create a personalized message that can be sent to a set of list contacts. The recipient of the email can simply click on link I have sent two them I order to visit the survey. Using emails means that I can also track who has opened the email, clicked on the link and filled in the survey. I will also give the respondent the opportunity to unsubscribe from any further emails if they so choose. Cole, S. T. (2005).

**Send by SMS.** By using this method, I will need a mobile number. Therefore, it is best to build the ability to collect numbers for SMS campaigns into my survey. I must get consent before sending SMS message. this is not only the law but will ensure I have received a better response rate. Using SMS means that you can target users on the move, for example if your survey is related to a customer experience, you can deliver the survey immediately after the event whilst it is fresh in the users’ mind. This will ensure the results are likely to be more accurate. Cole, S. T. (2005).

**Social media** is a great way to extend the reach of my survey as it allows contacts to share the survey. I can post a survey on a variety of channels and tract what works best for future campaigns. placing link to my survey on social media has the potential to increase the visibility to an audience that do not have emails or phones numbers. **Cole, S. T. (2005).**

## 3.6 SOFTWARE DEVELOPMENT METHODOLOGY

Software development process is the process of dividing software development work into distinct phases to improve design, product, management and project management. The methodology may include the pre-definition of the specific deliverables and artefacts that are created and completed by project team to develop and maintain an application. **Tutorialspoint (Jul 25, 2007).**

### 3.6.1 ITERATIVE AND INCREMENTAL MODEL

In this research proposal, I will use **iterative and incremental development**. The basic idea behind this method is to develop a system through a repeated cycles and in smaller portions at a time, allowing software developer to take advantage of what was learned during development of earlier parts of the system. Learning come from both development and use of the system, where possible key steps in the process start with simple implementation of subset of the software requirements and iteratively enhances the evolving versions until the full system is implemented. **Tutorialspoint (Jul 25, 2007).**

### 3.6.2 ITERATIVE MODEL DESIGN

Iterative and incremental development starts with a simple implementation of the subsets of the software requirement and iteratively enhances the evolving versions until the full system is implemented. at each iteration, design modification are mad and new functional capabilities are added. **Tutorialspoint (Jul 25, 2007).**



The reason that am going to use this model in the development of the mechanic finder is that, it’s working functionality can be developed quickly and early in the life cycle, results can be obtained early and periodically, parallel development can be planned for example in the development of the mechanic finder application, am going to develop mechanic app and the rider’s app, progress can be measured and less costly to change the scope.

However, its disadvantage is inevitable because it need more resources, more management attention is required and defining increments may require definition of the complete system. **Tutorialspoint (Jul 25, 2007).**

3.7 TOOLS USED**.**

Considering the fact that this is mobile application, I will use android studio as my code editor, firebase as my data base to store data of my users and to monitor them at ease, because it is a real-time server database and the java language will also be used abundantly in my proposed system.

## 3.8 PROJECT BUDGET

The Project Budget is a tool used by project managers to estimate the total cost of a project. A Project Budget template includes a detailed estimate of all costs that are likely to be incurred before the project is completed. Large commercial projects can have project budgets that are several pages long.

## 3.9 PROJECT SCHUDULE

In project management, a schedule is a listing of a project's milestones, activities, and deliverables, usually with intended start and finish dates. A schedule is commonly used in the project planning and project portfolio management parts of project management.

|  |  |  |
| --- | --- | --- |
| Start date | duration | End date |
| 10th Jan | 14 | 24th Jan |
| 5th Feb | 21 | 25th Feb |
| 5th March | 21 | 26th March |
| 4th April | 25 | 29th April |

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