

**MURANG’A UNIVERSITY OF TECHNOLOGY**

**MOBILE BASED AUTO MECHANIC FINDER APPLICATION**

**SC212/0743/2015**

**APROJECT PROPOSAL SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE A WARD OF THE BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING OF MURANG’A UNIVERSITY OF TECHNOLOGY**

**DECEMBER,2018.**

# DECLARATION

I **ETABO KELVIN ESEKON**, declare that the work contained in this project is my own original work and have not been previously submitted for obtaining any other qualification.

**ETABO KELVIN ESEKON** **DATE: ……………………….**

**SC212/0743/2015**

**SIGN: …………………………**

This is to certify that this project proposal has been submitted for examination with my approval as the supervisor.

**Mr. Ndia John DATE: ………………………………………**

**SIGN: ………………………………...**

# DEDICATION

This research project is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time and not forgetting Dr. Joseph Esekon who was always there to give me piece of advice whenever I feel low and down and to my beloved **wife** who was always there for me.

# ACKWOLEDGEMENT

Mr. NDIA John has been the ideal research project supervisor. His sage advice, insightful criticisms, and patient encouragement aided the writing of this project in many ways. I would also like to thank my fellow classmates whose steadfast support of this project was greatly needed and deeply appreciated. Thank you all.

# 

# ABSTRACT

This research proposal is heavily based on the mechanic finder application where the car owners and drivers will be certain to find a mechanic who will help them in a critical situation along the ways. questionnaire has been used in this study to collect the necessary information needed from the user concerning the problem they are facing and the android study and other relevant tools have been employed to develop this application.

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## CHAPTER ONE:

## 1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY**.**

Mobile auto mechanic finder is a mobile base mechanic application that allows the user or the car owners to locate the nearest mechanic within a range of 3km, by sending service request to the mechanic. Online mobile auto mechanics applications and web based applications that have been developed includes The motor ombudsman (UK), Autocurador (India), Gumtree (south Africa) and AA Kenya(Kenya).

The **motor ombudsman** is a mobile auto mechanic that has been initiated in the United Kingdom to help the car owners to get car services within a very short period of time immediately their cars broke down. its offers services such as car servicing, car repairs, MOTs, tyres, exhaust and more. For a basic garage search a user just enters the town or postcode and click search. (Ombudsman, 2016)

**Autocurador (mangaluru)** application was designed by students of NIT.K, India. Autocurador (Mangaluru) offers a wide range of services, right from engine servicing and wash through a network of service stations in that particular locality where the customer wants to book the service from and it does offer breakdown services and the best part is that it also offers pick and drop facility. (Chokra, 2017)

**AA KENYA** is an online auto mechanic web based in Kenya that plays a big role in helping the motorist who are frustrated and desperate to get car services along the road. It Offers services such as maintenance and repair of vehicles, providing the motorist with information and advice about purchase, negotiating attractive premiums, road mapping and the setting up of petrol depots, all of this service requires the customer to log into AA Kenya websites for them to get assigned a technical mechanic depending on the kind of the problems they have. (Fenzi, 1971)

The problem with these web based auto mechanic applications are, it requires the user to have access to laptops and computer to the services they require. This items are cumbersome even to carry them while on transit. This is a bit problematic and its actually makes the existing applications unreliable and inefficient to rely on.

Therefore, mechanic finder application is a mobile application which will be install to the user’s phone to make them enjoy better services, this application helps every individual to access and locate the nearest available mechanic with a range of 3 km distance by just logging to their apps on their phones and send service request via the internet and the mechanic will just accept the request from the user at ease.

### **1.2 PROBLEM STATEMENT;**

The issue of car breakdown is very rampant along the Kenyan roads and the car service station are very limited. The long distance drivers travelling in this regions are in great danger when their trucks and cars break down. They will be stuck there for long time before being rescued or attended to. They are in fear of attacks by the bandits, wild animals and as well as die of hunger and thirst.

The study done in United Kingdom by ombudsman, he came up with The motor ombudsman, a web based application that could help eliminate this problem once and for all, the user has to key in the town postcode to locate the nearest available cars service station. Students from NIT.K in India formed a web based application called AUTOCURADOR, they also seek to solve the same problem which they did. Other examples are GUMTREE in south Africa and AA Kenya.

However, the car owners and the motorist are still experiencing problems despites the development of these applications, the applications put in place are not portable and accessible by large number of people because they require users to have laptops and computer with them. This is quiet disturbing and annoying because not every individual is able to buy and access the devices mentioned above.

In response to this problem, this study proposes to investigate several options to make this application more convenient, efficient and reliable to the car owners and motorist. The study plans to consider developing a mobile application, which will be very convenient because the user has to install the app, do some registration and then signs up to enjoy better services. Mechanic finder enable the user to locate a mechanic who is within a range of 3 km distance and gives the driver the phone number and the full names of that mechanic, which will make it possible for the driver to call the mechanic whenever necessary.

## 1.3 OBJECTIVES

### 1.3.1Gerneral objectives

To develop a mobile based auto mechanic finder Application

### 1.3.2 specific objectives

1. To gather requirements that will help in the development of mobile auto mechanic finder Application.
2. To design mobile auto mechanic finder system.
3. To develop a system that is efficient and reliable to the customers.
4. To implement and validate a system.

## 1.4 SIGNIFICANT OF THE STUDY

This study is expected to be of great benefits to the following;

**Car owner’s and the motorist**. The study will actually provide real time communication and feedback to the stranded motorist and car owners who have been involve in a car breakdown. This application will help them locate the nearest mechanic at range of 3 km.

**Country has a nation.** A mobile auto mechanic application will create job opportunities to large population of youth who have skills in mechanic because mechanic personnel's will be required in large number to help the entire population

## 1.5 SCOPE

This study will be limited within the country (Kenya), since the study is trying to mitigate the problem affecting all riders all over the nation. The study will make sure the system operational is efficient and reliable by making it a mobile application and the security measures will be employed through uploading of mechanic documents to the servers for verification and validation.

## CHAPTER 2: LITERATURE REVIEW

### 2.1: REQUIREMENT GATHERING.

Requirement gathering is a procedure used to collect information about a specific or a particular problem in a particular domain. Therefore, here are some of the techniques used to collect data. These includes;

### 2.1.1 INTERVIEWS

An interview is a conversation where questions are asked and answers are given. In common parlance, the word "interview" refers to a one-on-one conversation between an interviewer and an interviewee. Therefore, requirement gathering can be conducted using this technique because it actually involves the end user and the developer. The end user can be able to tell where the problem is in the existing systems and the developer can try every possible way to resolved and improve on the same problem stated by the end user. (Johnson, L. 2013).

## 2.1.1.1 ADVANTAGES

**Accurate screening,** face to face interview helps with more accurate screening. The individual being interviewed is unable to provide false information in most occasions. Therefore, the researcher is as good as collecting the right and correct data of information concern a specific problem in a specific domain.

**Capture emotion and behaviour,** there is no doubt in interviews because the researcher can possibly study the behaviour and the emotion of the person being interviewed. Therefore, the researcher can definitely know if the collected data is correct or not

**Keep focus,** the interviewer is the one having control over the interview and can keep the interviewee focused and on track to completion. This gives an advantage to the one conducting a study on the existing problem because he/she will be getting real experience of the problem in that domain from the horse mouth.

### 2.1.1.2 DISADVANTAGES;

**Cost is a major disadvantage for face-to-face interviews**. They require a staff of people to conduct the interviews, which means there will be personnel costs. Personnel are the highest cost a business can incur. It’s difficult to keep costs low when personnel are needed.

**The quality of data** you receive will often depend on the ability of the interviewer. Some people have the natural ability to conduct an interview and gather data well. The likelihood of the entire interviewing staff having those skills is low. Some interviewers may also have their own biases that could impact the way they input responses.

**Manual data entry,** If the interview is administered on paper, the data collected will need to be entered manually, or scanned, Data entry and scanning of paper questionnaires can significantly increase the cost of the project. A staff of data entry personnel will need to be hired. Mobile surveys on iPads, tablets, or other mobile devices can cut-down on manual data entry costs and information is ready for analysis.

## 2.1.2: SURVEY

A survey is a data gathering method that is utilized to collect, analyse and interpret the views of a group of people from a target population. Surveys have been used in various fields of research, such as sociology, marketing research, politics, psychology etc. this technique is the most of the convenient technique to collect a lot of data and it is cost effective. (Schwarz, N.2016).

### 2.1.2.1 ADVANTAGES

**Low cost:** When conducting surveys, you only need to pay for the production of survey questionnaires. On the other hand, other data gathering methods such as focus groups and personal interviews require researchers to pay more.

**Convenient data gathering,** the online survey method has been the most popular way of gathering data from target participants. Aside from the convenience of data gathering, researchers are able to collect data from people around the globe.

**High representativeness,** Surveys provide a high level of general capability in representing a large population.

**Precise results,** they provide uniform definitions to all the subjects who are to answer the questionnaires. Thus, there is a greater precision in terms of measuring the data gathered**.**

### 2.1.2.2: DISADVANTAGES

**Inflexible design,** the survey that was used by the researcher from the very beginning, as well as the method of administering it, cannot be changed all throughout the process of data gathering.

**Not ideal for controversial issues**, Questions that bear controversies may not be precisely answered by the participants because of the probably difficulty of recalling the information related to them.

### 2.1.2.2.3 CONCLUSION ON REQUIREMENT GATHERING TECHNIQUES

In the Motor Ombudsman and Autocurador application requirement gathering was done using interviews.

In this research, the study considers taking a survey as a convenient technique for requirement gathering. Survey is convenient in the sense that you can gather a lot of information within the shortest possible time. The cost to conduct survey is cheaper than conducting the interview to gather information.

## 2.2: DESIGN AND IMPLEMENTATION

A design is simply the creation of a plan or convention for the construction of the object, system and measureable human interaction.

Implementation method is a systematically structured approach to effectively integrate a software based service or component into the workflow of an organizational structure or an individual end-user. System design and implementation techniques are as follows;

### 2.2.1 INCREMENTAL OR ITERATIVE

Incremental approach is divides the project in various independent parts and developing these sub-parts at the same rate or different rate and integrating them when ready. These can be completed and integrated into a common repository as they become ready. Once these parts are ready, next set is picked. It is also possible that all the parts can be simultaneously worked on and integrating them when ready in the central repository. In this technique the system is developed in phases to make sure that the errors are minimal or zero before the full systems is developed. for example, you can start by designing the interface and then the backend part of the system separately then later you integrate them together to form a full system. (Wagner, R. 2006, October).

This technique is more important because it is easier to debug and test the system during a smaller integration, more flexible in the sense that it is less costly to change scope and requirement, each iteration is easily managed milestone and it is easier to manage risk because risk pieces are identified and handled during its iteration

The technique has a number of disadvantages for example each phase is rigid and do not overlap each other and problems may arise pertaining to systems architecture because not all requirement are gathered up front for entire system.

### 2.2.2 SPIRAL MODEL

Spiral model is a combination of waterfall and iterative model, each phase in spiral model begins with the design goals and end with the client receiving the progress. Spiral SDLC model starts with a small set of requirements and goes through each developments phases for those sets of requirements. (Boehm, B.2011).

The spiral life cycle is shown as a spiral model that begins with the planning phase first from the centre (inward) of the spiral, eventually working its way outward, over and over again, until completion of the project. The planning phase will include activities such as feasibility study, a survey of user's requirements, overall design choice, generation of implementation alternative, and implementation strategy. The purpose of this phase is to have enough information to build a prototype.

Spiral model is important in the sense it is fat and its features are added in a systematic way to the system and there is always a space for customer feedback.

Looking for its disadvantages it actually works best for large projects, documentation is more as it has intermediate phases and it smooth operation needs to be followed strictly, this means that if you don’t follow it rules and procedures you may end up building a wrong thing altogether.

### 2.2.3 PHASING

It is the method of system implementation that involves changing from existing system to a new one that take places in stages. The Autocurador used this method to implement their system. The importance of this methods is that the issues of around scale can be addressed without major impact and the training can be completed in small parts, but there is also a big problem related to this technique, the problem is that it takes a lot of time to get the system fully online than other methods and there is a possibility of data loss if part of the system fails. (Breton, G. 2014, August).

### 2.2.4 DIRECT

This is the implementation methods used to implement the system when no phased or pilot is needed. It actually makes sure that the old system goes off or retired and the new system to be developed goes a live. The method has been used in the development of the motor ombudsman and the Autocurador application.

The importance of this techniques is that it does not need the system to be more critical. The problem is that if you are not sure how the system will work. (Govokhina,2014)

### 2.2.4.3 CONCLUSION ON DESIGN AND IMPLEMENTATION TECHNIQUES

In the design and implementation of the proposed system, the study will use iterative method to design the system because it is very easy to monitor the progress of the system given that every phase is develop iteratively then later integrated to a full system and the phasing method to implement the system simply because in phasing you can deal with issues around scale with no impact and the issue of correctness is observed because there will be minimal error made.

## 2.3 .1: THE MOTOR OMBUDSMAN;

The motor Ombudsman is a mobile auto mechanic that was initiated in the Westminster, London, it is the first voluntary and fully-impartial private sector ombudsman that provide a self-regulatory environment for automotive industry using it chartered trading standards institute approved motor industry code of practices.

The motor ombudsman provides an authority for the first time for the resolution of disputes within the motor industry for those that cannot be solved directly between a consumer which is the user and the trader. consumers can find a garage they can rely on using the motor ombudsman garage finder.

Thousands of garage including independent garages, main dealers and manufacturer authorised repairers that are accredited to the service and repaired code listed on the code of practise. Garages are available to review by the consumer helping others to find the garage that they can trust.

Garage finders covers the whole of the UK and Northern Ireland making it more suitable for the civilian to locate the garage and their problems resolve within the shortest possible time. The user is provided to key in the town codes and locate garage near to them.

The **motor ombudsman** offers services such as car servicing, car repairs, MOTs, tyres, exhaust and more. For a basic garage search a user just enters the town or postcode and click search. (Ombudsman, 2016)

### 2.3.2: STRENGTH OF THE MOTOR OMBUDSMAN

The motor ombudsman is a very powerful mechanic and garage finder platform in the United Kingdom. This platform provides real time communication and feedback between the users or the car owners and the mechanic, it also provides varieties of car service therefore the consumer can minimise time wastage for locating other services and the motor ombudsman reduces the cost by offering their services at a reasonable price. (**Ombudsman, 2016**).

### 2.3.3: WEAKNESS OF THE MOTOR OMBUDSMAN.

The motor ombudsman has weaknessjust like any other platforms in the globe. The motor ombudsman is a web-based platform that gives impression that the user has to be on his/her laptop or computer to request service from the mechanic.

According to the MoneySavingExpert.com report, the report has found that the ombudsman landscape to be too confusing and unequal and the ombudsman failures are leaving consumers feeling frustrated, out of pocket and that the whole process is completely waste of time.

Secondly ombudsman powers are completely inconsistent with varying standards for membership, authority and the ability to enforce decisions. This “devalues” the meaning of the term ombudsman.

Thirdly uploading document on communication ombudsman sites not the easiest. (Ombudsman, 2016)

## 2.4.1: AUTOCURADOR (MANGALURU)

application was designed by students of NIT.K, India. The founders Godana Dili and Kumar Gunda wants a four-wheel mechanic finder hassle free. When asked about the idea for starting up the app, they said “personal experienced that happen a year ago was the reason we had gone on a long drive when a bike parked on the road fell on our vehicle and resulted in a dent on our SUV”. when they approached the nearest car showroom they quoted a hefty price to clear the dent. Through this life experienced the dual just decide to develop a web-based application to help other population in India from such worst scenarios.

Autocurador (Mangaluru) offers a wide range of services, right from engine servicing and wash through a network of service stations in that particular locality where the customer wants to book the service from and it does offer breakdown services and the best part is that it also offers pick and drop facility. (Chokra, 2017)

### 2.4.2 STRENGTH OF THE AUTOCURADOR APP

This application has brought up a good experienced to the Indian people at large, the car owners can book a service at any stations near their locality rather than hiring more expensive car showrooms at the eve of the car breakdown. Consequently, the garage finder has become a hassle free for four wheel owners, what is need Is just to sign up or sign in for the app to locate the nearest available services stations.

Another major advantage is the convenience factor, mobile mechanic comes to you and even able to work on your vehicle while you are at work, assuming your office is in an area conducive to such work. This eliminates the need to take time from work school or other responsibilities in order to service your car and save you a significant amount of money.

### 2.4.3: WEAKNESS OF THE AUTOCURADOR

The most glaring disadvantage to this app is limit to access to certain equipment’s which typically found in a physical mechanic shop additionally if this mobile mechanic is working alone there could be a limitation on certain jobs that require more than one tech to complete.

## 2.5 CONCLUSION

In the previous study conducted to solve the existing problem, majority of the developed web-based application have really tried to make it hassle free to get any available car service station for the car owners. The motor Ombudsman, the Autocurador and AA Kenya and a few auto mechanic applications put in place to locate car service stations. These application have really help a lot, in the sense that booking a car service at your place of work and at home has become very easy and less costly.

From these studies conducted, they have assumed and conclude that everyone can access internet connection in order to get access to the car service provides which is not true, this is actually a problem to be mitigated since not every place internet connection is good, sometimes the customer may not access the smart phones thought the technology has developed. The research has failed to tell us what will the user do when there is internet connection problem. That’s why in this research, the study will introduce mobile based auto mechanic finder application to help the user to locate a mechanic within a range of 3km distance.by dialing a certain provided code.

# 

## CHAPTER 3 RESEARCH 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

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 the study 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. The study will employ the use of questionnaire

## 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 solve a specific problem. The study will use survey since the study is trying to address the issue that is affecting the entire nation and taking interviews is expensive. Survey involves development of questionnaires, observation and focus groups. The study will actually set on questionnaire. The study will employ the use of questionnaire because it is efficient and less time consuming and it is easy to collect data across the entire population of the study. **Barber L B (2008).**

## 

## 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

In this research proposal, the study will employ the use of **iterative.** 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 modifications are made and new functional capabilities are added. **Tutorialspoint (Jul 25, 2007).**



Iterative and Incremental development is a combination of both iterative design or iterative method and incremental build model for development. "During software development, more than one iteration of the software development cycle may be in progress at the same time." This process may be described as an "evolutionary acquisition" or "incremental build" approach."

In this incremental model, the whole requirement is divided into various builds. During each iteration, the development module goes through the requirements, design, implementation and testing phases. Each subsequent release of the module adds function to the previous release. The process continues till the complete system is ready as per the requirement.

The key to a successful use of an iterative software development lifecycle is rigorous validation of requirements, and verification & testing of each version of the software against those requirements within each cycle of the model. As the software evolves through successive cycles, tests must be repeated and extended to verify each version of the software.

The reason this study employs 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. **Tutorials point (Jul 25, 2007).**

## **3.7 TOOLS**.

Considering the fact that this is a mobile application, the study will employ the use of Android studio as code editor, Firebase as the data base to store data of 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 the study proposed system.

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## 3.8 APPENDICES

### APPENDIX I Questionnaires

### **Directions: Please try to answer this question genuinely.**

**I. Please fill in your details here, (note; your data will not be disclosed to anyone else. User’s privacy is our esteem concern)**

**Name:**

**Age:**

**Gender:**

**Email Address:**

### Questions

**Q1: what is your experience riding on Kenyan roads?**

**Q2: Have you ever got stacked on the road due to car breakdown for long hours without being attended to?**

**□ Yes □ No**

**If yes? Please gives us a reason why?**

**Q3: How would you like this problem to be solved?**

**Q4: Do you think coming up with a mobile application to locate a mechanic will do better in solving this problem?**

**□ Yes □ No**

**if yes, why?**

**Thank you for sharing your thoughts with us. Enjoy your ride at Mechanic finder company**.

## APPENDIX II

### 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.

|  |  |  |
| --- | --- | --- |
| Items | Number of items | Rate per item |
| Software cost  1.Operating system  2.Android studio  3.Databaseuserlicense(firebase premium) | 1  0  1 | 1500  0  1000 |
| Hardware costs  1.PC’s  2.Additional memory  3.Back up devices  4.Disk storage | 1  1  1  1 | 40000  1500  2000  1000 |
| Network costs   1. Cabling or wireless LAN, WLAN OR Other networks   2.router | 1  0 | 1000 |
| TOTALS | 7 | 48000 |
|  |  |  |

## APPENDIX III

### 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.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ACTIVITIES | DURATION IN MONTHS | | | |
| JAN 2019 | FEB 2019 | MAR 2019 | APRIL 2019 |
| REQUIREMENTS GATHERING |  |  |  |  |
| DESIGN AND DEVELOPMENT |  |  |  |  |
| TESTING |  |  |  |  |
| IMPLEMENTATION |  |  |  |  |
| DOCUMENTATION |  |  |  |  |