

Chapter 1: Introduction

1.0 Introduction

Trevor Dollar Real Estate Android Application is a mobile based software that helps people to sell or rent properties. The android application has a searching facility where people can search for a specific property utilizing different particulars, for example, that of value, location and so forth. Moreover the android application will send notifications of when a payment is expected and when there is another posting inside the firm. Aside from that the android application additionally calculates the interest to be charged for a given property. The android application will be gotten to by means of Wi-Fi or using mobile data of any mobile network operator on any gadget that has an android working framework running on it.

1.1 Background of Study

Dubois, Jolibort and Muhlbacher (2007) defined the background of study as the examination stage that gives essential description on a specific theme. There are various real estate systems that are planned and created to convey content and give feedback to its clients. Immofli android application is one of these systems, the application furnishes its clients with inquiry offices everywhere throughout the world as well as advertising packages (J.Karner 2016).

Trovit Homes is another system that has clients from Asia, Australia and South America as its key clients (M White 2012). This framework has been for the most part utilized by people from nations Like Brazil, France and so forth. The objective of the framework is to give intrigued people data, for example, that of value, area just as making boards for its clients.

Most of the current real estate systems predominantly center on the purchasing and selling/renting of properties. The systems basically center on the seeking angle, yet viewpoints, for example, that of interest and deposits to be charged are ignored. Aside

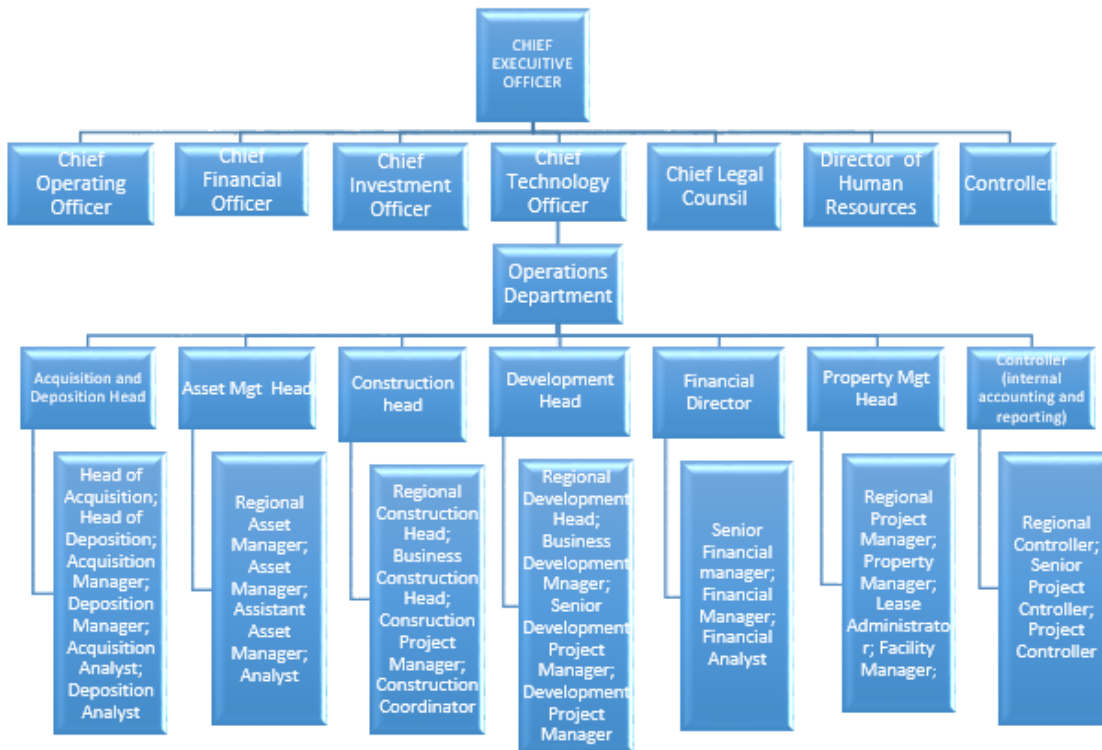
from that the current systems neglects to inform its clients when certain payments are expected. The current frameworks don't offer property valuations. The effectively existing real estate systems inside Zimbabwe don't give satisfactory information about the properties. Notwithstanding that, with the ascent of postings accompanies the introduction of numerous other real estate organizations (Chinjekure 2018) Trevor Dollar ought to have a system that can address every one of its clients' issues so that, the organization won't lose its clients. Moreover, competitive rivalry in Zimbabwe and price have made economic situations extreme and edges are under serious weight (Lyon 2007), for Trevor Dollar to address its clients' issues the organization must empower its clients to view, list, get property valuation of wanted properties regardless of one's location hence the need for developing a real estate android application for the firm.

1.2 Background of the Organization

Trevor Dollar Real Estate is an association that promotes all the accessible property posting crosswise over Zimbabwe including later created houses, shut homes just as the rentals. The association was first formed in 1946 under the name Kunney and Kunney the organization had some expertise in books and accounting and little practice in genuine homes. In 1968 Mr. Trevor Dollar purchased the organization henceforth the business concern expecting the new name Trevor Dollar Real Estate. organization is situated in Gweru. The association offers an assortment of organization property arrangements, evaluation and transferring of the property the nation over. Dollar Real Estates is enrolled with Real Estate Agent Council of Zimbabwe, Real Estate Institute of Zimbabwe and Values Council of Zimbabwe

1.2.1 Organizational Structure

A company organogram structure is a diagram that shows the structure of a specific organization and the connections between the various people, areas and businesses at various dimensions inside that organization (Bezuidenhout et al 2007). An authoritative structure describes how certain undertakings are allocated, composed and how the supervision is done until the consummation of the task.



Fig

1.1 Trevor Dollar Real Estates Organizational Structure

1.2.2 Vision

The vision of the organization is to accomplish the accompanying qualities:

- Integrity
- Professionalism
- Teamwork

1.2.3 Mission Statement

We are here to serve our clients past an additional mile and give tasteful, effective and proficient administration which is guided by the land's morals. To maintain the client well-disposed and

affable condition which is sufficiently helpful to enable and change networks inside the setting of land.

1.2.4 Service Portfolio

Trevor Dollar offers you an assortment of services in Property Sales and Management valuations. Our business administrations spread the entire nation and range from modern, private, business property and little possessions. We offer exchange of ventures and free market evaluations at a deal commission of 5% and 15% VAT on appointing chargeable moreover.

1.3 Problem idefinition

At present a great deal of people are searching for properties to lease and purchase in Zimbabwe while some are looking for organizations or people to whom they can pitch their properties to, these postings are regularly found in papers, organizations' sites and web-based social networking. The issue of these systems are that one should end up venturing out to Gweru in order to book for a specific posting. Additionally, another issue related with these postings is that they don't furnish people with sufficient information and furthermore some social media platforms are not reliable. Below are the identified problems currently being faced :

- No pictorial presentation of the property of what it looks like for example in newspapers where they simply list the cost and estimations of the proprty being sold - Organizations or people looking for convenience are unfit to see what the properties precisely resemble.

- Since a large portion of the adverts are done through newspapers which is a single direction correspondence channel where clients are not ready to ask or get lucidity on specific issues in this manner correspondence among publicists and searchers is poor henceforth they might be misfortune in business as individuals might be reluctant to consult.

- Data decentralized - There is no database that stores data pretty much every one of the properties that for sell and loaning since they utilize manual books for the booking of properties or homes.
- Slow reaction time - The present system does not send alarms messages to property searchers giving update on new properties that are up for sell or the ones that would have been sold out.

1.4 Aim

To develop android application for Trevor Dollar.

1.5 Objectives

- To search for a specific property using various specifications
- To calculate the interest and deposit charge on property
- To track customers application status
- To notify clients on due payments through the use of SMSs
- To value properties

1.6 Instruments

Android studio

It is the authority coordinated improvement condition (IDE) for Google's Android working framework, based on Jet-Brains' IntelliJ IDEA programming and planned explicitly for Android advancement. It is a substitution for the Eclipse Android Development Tools (ADT) as essential IDE for local Android application advancement. Android studio is gradle-based form support. Gradle is an open-source construct robotization framework that expands upon the ideas of Apache Ant and Apache Maven and presents a Groovy-based space explicit language (DSL) rather than the XML structure utilized by Apache Maven for proclaiming the task arrangement. Gradle utilizes a coordinated non-cyclic chart ("DAG") to decide the request where assignments can be run. It likewise gives Android Virtual Device (Emulator) to run and troubleshoot application.

XAMPP

XAMPP is a free and open source cross-stage web-server arrangement stack bundle created by Apache Friends, comprising fundamentally of the Apache HTTP Server, Maria DB database, and translators for contents written in the PHP and Perl programming dialects.

Advantages

- It is a straightforward, lightweight Apache circulation that makes it very simple for designers to make a neighborhood web server for testing and sending purposes.
- XAMPP is additionally cross-stage, which implies it works similarly well on Linux, Mac and Windows.
- Since most real web server arrangements utilize indistinguishable parts from XAMPP, it makes progressing from a nearby test server to a live server amazingly simple also

PHP

•PHP is a server-side scripting language intended for Web advancement, yet additionally utilized as a broadly useful programming language. Hypertext Pre-processor. PHP code can be inserted into HTML code, or it very well may be utilized in mix with different web layout frameworks, web content administration frameworks, and web structures.

Focal points of utilizing PHP:

- It is anything but difficult to use since it utilizes C like grammar along these lines making it simple for one to make site contents.
- It has a ground-breaking library bolster making it simple to discover useful modules, for example, PDF, Graph and so on.
- PHP additionally has a worked in database association modules in this manner one can without much of a stretch interface with the database.
- PHP can likewise be effectively kept running on various stages including windows, Linux making it simple for clients to discover facilitating specialist co-ops.

1.6 Justification

The point of the task is to improve Trevor Dollar Real Estate in getting to be a standout amongst the best real estate organizations in Zimbabwe just as making it simple for intrigued people to gain data about the organization. The portable application will focus on all android clients. The framework will accompany focal points, for example, that of:

- Calculating the interest and deposit to be charged as this will assist clients with knowing the amount they should put aside for before buying a given property
- Searching for a specific property relying upon different specifications as this will make it simple for clients in their choice procedure.
- Reduces the human exertion and devours less time contrasted.
- To attract customers on the internet

- This system solves the reachability problem
- Easy to search property.
- To provide information to the user at his/ her fingerprints
- Easy to maintain transactions
- The proposed system also provides a feedback and reporting platform on a given listing so that all customers' requests are attended to.

1.6 Conclusion

The current system of having interested customers travel to Gweru so as to inquire information about listed properties within the company has resulted in the development of a real estate android application for Trevor Dollar Real Estate. The background of the study has been stated, explaining the need of coming up with the android application. The problem statement was also noted down while the instruments and methods to be used in the development of the system were well explained. The next phase is the planning phase that focuses on how feasible the proposed system is as well as the work plan of the project.

Chapter 2 : Planning Phase

2.1 Introduction

This stage focuses at the distinctive planning procedure of the whole project. An intensive feasibility learn about will be carried out which will focus on a number of areas such as the technical, operational, economic and social feasibility. The feasibility find out about will help determine if the proposed system is a valuable investment. The business value is assessed to decide whether or not the system will bring huge value to the organization. A risk analysis will be carried so as to clearly spotlight all the risks related with the project. Moreover the project work plan will additionally be carried out so as to provide a clear perception of the projects agenda and all the timelines for the succeeding stages.

2.2 Business value

Sliger et al (2008) states that business value is a term that comprises of distinctive varieties that define structure and welfare of the business in the long run. The value of business magnifies the notion of value of a firm yonder economic cost to include different methods of value such as client value, worker value, supplier value, coalition partner, managerial price and societal value. These forms of cost are no longer continually directly measured in economic terms. The implementation of the Trevor Dollar property listing android software will bring the values to the institution, accelerated marketing, advertising, verbal exchange and greater correct and well timed information

The system will aid

- Customer Value- Easier and quicker response to customers request will result in turning in a satisfactory provider to the customer.
- Employee Knowledge-Enhances business efficiency and mindset amongst employees considering that it will be quicker and less difficult to understand. The system logs all the requests made and the responses made as a consequence developing an information base for future references.

- Shareholder Value- Through elevated client acquisitions and retention with the aid of faster decision of clients queries, patron base will and market will, will be maintained and sustainable cash go with the flow maintained.
- Manager Value- Enables fast knowledgeable company decisions to be made thru distinct periodic reports at the disposal of administration and get admission to update incident archives.
- Channel Partner Value- Offer ideal security by the usage of an impervious database framework that will thwart connections that are no longer authorized to the acute information store.
- Societal Value- Because of the proactive nature of the real estate system, the popularity of all equipment is continuously monitored and maintained and will reduce chanced of inflicting risks to the environment and the community which host the infrastructure such as wireless base station.

2.3 Feasibility Study

Feasibility study seeks to exhibit the worthiness, viability of a project given the sources that the employer provides (Grant, Hackney and Edgar (2010)). The feasibility study focuses on aspects such as technical feasibility, economic feasibility, Operational feasibility as properly as social feasibility. All the components mentioned earlier are going to be looked at so as to decide if the system is a worthy investment

2.3.1 Technical Feasibility

Young (1970) defines technical feasibility as the valuation primarily based on a design plan of requirements of the systems, so as to decide if the enterprise has rightful technical ride to knob completion of proposed project. This considers the assessment on resources like, technical expertise and technical assets on site. The essential center of attention is to see if the assets at hand are able to match with requirements and all the logistics wanted so as to make this system a success.

2.3.1.1 Technical Expertise

Technical feasibility is in the main involved with the presence of expert personnel that will be successful to work with the system (Kendal. 1999). There is want for human skill sources all through the development of the proposed system as nicely as all through its existence time use. Trevor Dollar has bought a vast of intellectual personals at its disposal therefor the knowledge for the system are effortlessly available. Thus the corporation can have the funds to access appropriate personnel to work with the proposed system. The corporation already have relatively qualified IT personnel who have a deep appreciation of the android programming language hence it will be more cost-effective to patch up the gadget for the duration of maintenance of the system.

2.3.1.2 Technical Resources

This specifies the availability of assets and their measure of practicality for a specific technical options (Bentley and Whitten, 2007). The technical resources required encompass hardware (tangible elements or digital electronic devices) and software (intangible sources that manipulate the electronic devices). The following diagrams show the hardware and software program assets that have been required for Trevor Dollar Real Estate.

Table 2.2 Hardware Necessities

Hardware Component	Quantity	Specifications	Status	Comment
SQL Server	1	❖ 2* 12 core Intel Xeon E5 2600 v2 series processor 2* 12-core	Available	The server is already available
Personal Computers	4	❖ 4 Gig RAM ❖ Core i5 intel	2 Available	Trevor Dollar agreed to buy 2 more
Printer	1	❖ Hp laser jet 1015	Available	Already available
Network Modems	2	❖ Econet GMS Modem	All 2 available	There is no need to buy more
Connecting cables	10	❖ 30m long Rj45 Connectors	8 Available	Trevor Dollar agreed to buy 2 more
UPS	2	❖ Power backup 220v	Available	All are available

Table 2.2 Software Requirements

Software	Version	Status	Comment
Operating System	Windows 10 Professional	Available	Already installed
WAMP Server	2.0	Available	Already installed
Microsoft Word	2013	Available	Already installed
Adobe dream weaver	Creative cloud	Available	Already installed
SAP Crystal Reports	2013	Available	Already installed
Anti-Virus	A vast 2017	Available	Already installed

2.3.1.3 Overview on Technical Feasibility

The researcher managed to do an analysis of the technical requirements that is both hardware and software inside the organization as a result most of the required tools for the operation of the new system are already present within the organization. Thus the system is technically feasible.

2.3.2 Economic Feasibility

Economic feasibility is a valuation that defines the constructive economic merits that the new system will offer to the organization. It involves the identification and quantification of all the expected merits. This comparison involves of a cost benefit analysis (Michele, 2008). There are countless tools are used to measure economic feasibility and these include cost benefit analysis, return on investment and Payback Period.

2.3.2.1 Cost Benefit Analysis

Cost benefit evaluation is described as a technique to asses' investment viability (Chan 1996). According to Beardshaw and Scott (2011) cost benefit analysis aims to consider

the costs and benefits of the proposed funding projects as information when determining upon the desirability of the project.

2.3.2.2 Costs

These are dedication and sacrifice on organization's resources in order to acquire whatever it need, quantified in monetary price (Jaffe, 1967). The costs which had been stated encompass developmental costs and operational costs.

2.3.2.3 Developmental Costs

These are the costs a commercial enterprise incurs from researching, developing and introducing a new product or service. Garrison and Noreen (1997) states that improvement costs are the sum of all charges acquired from beginning of task to implementation of the project. These are the costs to be incurred at some point of the development process solely and are estimated at the onset of a project and should be refined at the end of every undertaking phase.

Table 2.3 Development Costs

Item(s)	Unit Cost	Quantity	Estimated cost(US\$)
Sever	160	1	160
Personal computers	120	1	120
HP printer 1015	120	1	120
Network Modem	350	1	350
Total			750

2.3.2.4 Operational Costs

These are expenditures which are related to the functions of the business, or the functionality of the device, components, equipment or facilities. They are the expenses of resources used in the agency just to maintain its existence. These costs are incurred on a day to day operation of the organization. These bills may also encompass security, staffing, electricity, hardware maintenance, software procurement and storage rental.

Table 2.4 : Operational Costs

Operations	Estimated Costs for Year 1 (US\$)	Estimated Costs for Year 2 (USD)	Estimated Costs for Year 3 (US\$)
Software maintenance	50	100	150
Hardware maintenance	80	100	120
User training and development	100	80	100
Software License	120	170	170
Total	350	450	550

2.3.2.5 Benefits

According to Randall (1996) benefits are the inflows or value of suitable reputation that an enterprise recognize from its operation. Benefits are grouped into tangible and intangible. Dowson (2009), states that tangible benefits are advantages that accumulate without delay via the usage of the new system. Tangible benefits are quantified in economic terms. Tangible benefits consist of decreased operational costs, labor reduction and reduction in stationary use. According to Campbell and Brown, 2003 intangible benefits can't be assigned an economic price but have a considerable business impact. Intangible benefits include greater correct and timely statistics and expanded time saving.

Table 2.6 Benefits Table

Description	Approximate VALUE (USD)
Reduction in revenue leakage	2000
Reduction in labour costs	4000
Reduction in SLA target fines	6000
Reduction in stationery	300
Total	12 300

2.3.2.6 Summary of the Cost Benefit Analysis

The systems benefits are evaluated against the costs and the results are shown below.

Table 2.7 Cost Benefit Analysis Table

Benefits / Costs	Year 2019 (USD)
Tangible Benefits	
<i>Real Estate App Revenue</i>	250 000
Intangible Benefits	
<i>Increase in employee morale</i>	200
<i>Improved quality service</i>	1000
<i>Goodwill</i>	2000
Total Benefits	<u>253 200</u>
Costs	
<i>Loss of market Share (0.8*250000)</i>	200000
<i>Operational Cost</i>	350
<i>Developmental Cost</i>	750
Total Cost	<u>201 100</u>
Net Benefits	<u>52 100</u>

2.3.2.7 Overview on Cost Benefit Analysis

From the discussion above, it is surprisingly evident that the benefits outweigh the costs. Therefore it will be profitable to think about intending with the undertaking as it will bring advantages to the institution. A further analysis has to be performed on the project, the other approach that was utilized on the undertaking is Return on Investment (ROI).

2.3.2.7 Return on Investment

Hoque (2005) states ROI as the merit to the part that has invested resulting from the input of capital of some resource. It is additionally a ration of an organization's productivity, equal to a fiscal year's revenue divided with the aid of frequent inventory and favored stock best plus long time period debts. It calculates how efficient the business enterprise uses its capital to generate profit. High ROI suggests funding positive aspects examine favorably to value of investment (Shein, 2015). Below is a system on how to calculate it:

$$\begin{aligned}\text{Return on Investment (\%)} &= (\text{Net Benefit/ Total Costs}) * 100 \\ &= (52\ 100/201\ 100)*100 \\ &= 25.9\%\end{aligned}$$

From the above Return on Investment calculation, we can settle that the ROI is advantageous which skill the funding earnings compares favorably to investment cost, as a result the venture should be undertaken.

2.3.2.8 Net Present Value

Bemani (2014) states that NPV is the totality of current values of cash inflows and outflows over a period of time.

$$\text{NPV} = (\text{Total Benefits} - \text{Total Costs}) / (1+r)^n$$

Where r = interest rate

two N=number of year

NB: NPV calculation at a cut price price of 20%

$$\begin{aligned}&= \text{fifty two } 100 / (1+0.2)^1 \\ &= 43\ 417\end{aligned}$$

Comment: Development displays an advantageous NPV of \$43 417. Randal (2001) states that, a positive NPV indicates the mission will be profitable, presumtuos the projected cash flows are accurate. A negative NPV indicates the project will be lossmaking and therefore be attuned.

2.3.2.9 Overview of Economic Feasibility

As portrayed above, the project is economically viable in the feel that all charges skilled in development and implementation are blanketed by using the deserves of altering into a new system. Digitalization additionally brings a handful of advantages which assist the corporation to minimize expenses and make the most of efficiency.

2.3.3 Social Feasibility

According to Brown (2010), social feasibility focuses on the advantages the system to be developed deliver to the society apart from the enterprise itself. (Shelly and Roseblatt, 2008) states that social feasibility controls whether the proposed project is to be best to the users or not. The proposed system proved to be socially feasible considering it will positively impact the society.

- Improvement on quality of life for the residents this is due to the fact of retrenchment programs that will be presented to individuals who would have been retrenched as an end result of the new changes.
- The potential of residents and employees to work remotely enlarge their social time with their families.
- Self-esteem to the younger age crew as they desire to be pioneers when it comes to the use the technology and computers.
- Employment advent to nearby graduates who have IT associated certificates or diploma who will maintain the machine and carrying out inductions.

2.3.4 Operational Feasibility

According to Bentley and Whitten (2007) operational feasibility involves the projecting and predicting the viability of the system to use when it is totally developed and implemented, relying on the human resource available. For it to be possible the management ought to support the system. The system proved to be possible as it addresses various issues which follows.

- Security measures that minimize fraud by allowing the administrator solely to manipulate the fame of the machine like adding customers and deleting them.

- Provision of person manual makes it easier for use and additionally induction and education is provided.
- Users and purchasers gain from a consumer pleasant interface that is be provided via the system.
- The machine permits multitasking where quite a number users can get right of entry to the system without t fail.

Considering operational feasibility it is practicable to enhance the system as the crucial requirements for the operation underneath this device are available. Comes next is the risks analysis.

2.4 Risk Analysis.

Brown (2008), expressed it as the method that the analysts raise out to scrutinize the vulnerabilities that are allied with the new system. The table beneath indicates the dangers that may be encountered related with the new system and the feasible solutions to curb them.

Table 2.8 Risk Analysis Log

Risk	Probability of occurrence	Impact of Risk	Preventative measures
Resource constraints	Average	Delay the finishing time of the project	Start the project when adequate materials are available
Missing the time schedule of implementation	Average	It will increase the company's costs since they would have to rely on manual labour.	Implement proper time scheduling
Lack of time Spirit	Average	Retards coordination result in failure to implement the system and resistance to accept change	Creation of work groups which encourage team spirit.
Shortage of expert and expertise knowledge	Minimal	System will fail to perform its functions	Hiring experts from reputable providers

2.4.1 Other risks

These are other dangers which are not main but affecting the system however they additionally have an impact to the project.

- Economic issues: due to the current financial scenario in Zimbabwe the estimated charges that would have been made will have to exchange each now and then due to the high inflation rates. Thus making hard to come up with a constant budget.
- Political issues: Authorities' insurance policies like web get admission to privacy will avoid the utilization of the system as once in a while it will order ISPN companies to change of their web for this reason users will be affected. The threat can be solved thru adherence to the government policies and pre-warn the users in case of net shutdown.

2.5 Stakeholder Analysis

As described with the aid of Mendelow (2010), a stakeholder is anything that is capable of making use of, has have an effect on and strengthen anything of the proposed project. These are divided into two that is direct and indirect. Indirect stakeholders are the persons or organizations with political influence to have an impact on the common result Fletcher(2003) whereas direct stakeholders are the customers, builders and managers who have their response to a state of affairs have an have an effect on the challenge without delay and these people are additionally blanketed in the lifecycle of the project.

Savage et al (2011) states that Stakeholder evaluation broadly speaking focuses on realizing personnel, organizations and groups who have whole subject in a specific mission and compelling moves to obtain their interests and expectations. Analysis is to be carried out in the early ranges of the assignment so as to realize dangers and fundamental shape of verbal exchange which can be worried in the ordinary mission design (Mitchell and Wood, 1997). People and groups at numerous degrees have adverse expectations, reasons and interests. Modern challenge administration cogitates to all client and the company but looks more afield to the way in which it influences on society overall. Environmental contemplations are a well-known instance of this.

Below lists the stakeholder for the proposed system:

- Project Managers
- Developers Students

- Staff
- Visitors
- Property holders

An in-depth stakeholder analysis and communication design used to be conducted with the goal to increase the projects chances of success in reaching deliverables on time and on budget. After these stakeholders were recognized and their pastimes had been figured out, the proposed system can now be proceeded with.

2.6 Project Work Plan

It is supposed to state in particular element how a challenge is to be partaken, individuals to function precise duties and the order in which the undertaking will be completed Peter (1994). Project Management Body of Knowledge noted that it is a formal authorized file supposed to be used to reveal undertaking manipulate and execution.

2.6.1 Project Schedule

It portrays the specific dates and time each endeavor will be executed.

Table 2.10 Project Schedule

Phase/Activity	Starting Date	Ending Date	Duration(Weeks)
Project Introduction	17/01/19	20/02/19	1
Project Planning	25/02/19	28/02/19	1
Project Analysis	04/03/19	11/03/19	2
System Design	11/04/19	26/04/19	3
Implementation and Testing	29/04/19	03/05/19	2
Maintenance	09/10/19	16/010/19	1+++
Documentation	17/01/19	Ongoing	-

2.6.2 Gantt Chart

Wallace and Gantt (1922), states that a Gantt chart illustrates a project schedule portraying the start and end date of the incurable features of the project.

Week Activity	1	2	3	4	5	6	7	8	9	10	11	12
Project Proposal	█											
Planning		█										
Analysis			█	█								
System Design					█	█	█	█	█			
Implementation and testing										█	█	
Maintenance												█
Documentation	█	█	█	█	█	█	█	█	█	█	█	█

Fig 2.1 Gantt Chart

2.7 Conclusion

Trevor Dollar Real Estate Android Application was put under project development evaluation techniques which encompass the feasibility study, business value as well as risk analysis. From the decision above the proposed system was once deemed to be feasible this is so because the advantages that comes with the proposed system outweigh its costs and risks. A risk analysis was carried out so as to identify the risks that are in all likelihood to affect the system. The work layout of how each activity in the development process will be completed was well defined as well as the order of the scheduled mission tasks. The subsequent chapter is the analysis phase which focuses on the data collection strategies as well as analyzing the current system.

Chapter 3: Analysis Phase

3.1 Introduction

According to Godfrey (2000), system analysis is an approach that focuses on the inspection, modelling and transformation of information with the intention of bringing out data that is valid seeing that a standard and precise deliverable artefact is the one that suites the operators anticipations. System analysis is regarded as one of the important stages. Aspects such as that of data gathering strategies that were employed in carrying out the research will also be discussed. System Analysis focuses on the functionality, methods related with the current system and also the direction of flow in relations of how they would be connecting and synchronizing with each through the use of context diagrams, dataflow diagram and use case diagram. In addition to that, the necessities of the new system will be outlined as well as the alternatives available for delivering the system.

3.2 Information Gathering Methodologies

In order for a profitable development of the new system, there was need for acquisition of applicable facts about the current system and their views about the introduction of the new system. Information gathering is the system of acquiring and accumulating statistics or data from the field Brown (2010). In a bid to attain valuable and integral facts about the present system. Tools such as interviews, observations and questioners had been used in gathering the data.

3.2.1 Interviews

This type of conversation approves asking questions and getting response between two or more human beings around (Gillham, 2008). There are different kinds of interviews and these consist of structured, unstructured etc. The researcher used the structured interview to gather the required information. A structured interview is generally formal and organized and it consists of several interviewees. The interviewer interviewed the IT controller, Real Estate director as well as the folks from the community. Questions such as that of the day to day actives where asked. In addition to that the interviewer additionally requested the interviewees on how the present day system works and about their opinions about the proposed system. The interview conducted was useful as it uncovered the following aspects which were to be covered in the system.

- A device that lets individuals to search for required estates
- A properly designed interface that is person friendly.
- Quick report searching and facts retrieval.
- A system that allows management of queries on line that is sending and replying.

3.2.1.1 Advantages of interviews

- Interviews created a common community of exercise as the interviewed individuals felt to be part and parcel of the system improvement thus stimulate easiness in developing the system.
- Clarity was once completed on questions that the interviewee misunderstood.
- It published other features that were supposed to be included which the analyst was unaware of.
- No field costs were incurred as they had been no use of formal halls.

3.2.1.2 Disadvantages of interviews

- the interviews had been exposed to bias as some employees' feared victimization.
- Danger of leading the interviewee or piloting the interview specially on attempting to explain questions and maintain the topic.

3.2.2 Observation

Bradburn , Sudman and Wansink (2006), states that an observation is an evidential centric method that is greater involved with the behavior as in contrast to the opinions of the clients/users. The analyst efficaciously carried out this methodology with the aid of pretending to be a patron who wanted to rent a house in Gweru. The observer managed to conclude the following.

- Overcrowding of real estate seekers who were booking for estates to buy/rent.
- Customers have been complaining about the poor services offered by using the company.
- There was once misplacement of file.

3.2.2.2 Disadvantages of Observation

- The conclusion made did not reflect the day to day state of affairs at Trevor Dollar Real Estate considering people are dynamic therefore the conclusions made had been biased.
- It was tough to study problems of the past using observations.
- Opinions and attitudes were difficult to be study through the use of observations

3.2.3 Questionnaires

According to Wilimack (2013), a questionnaire is a find out about device comprising of a progression of inquiries and distinctive prompts in order to successfully collect the require facts for the respondents. There are unique types of questionnaires, for this research motive the in- house survey approach wa used. This kind of a questioner includes the researcher touring respondents in their houses or place of business Wilinack (2013). This methodology used to carry out with the aid of broadcasting the questionnaires which had yes or no answers and gaps for other suggestions. The questionnaires have been disbursed to the common public and consumers who have been present at corporation so as to deduce their emotions about the new system and additionally inserting their very own recommendations if there were viable improvements being needed. Following are the effects that have been obtained from this methodology.

- Users wanted an easy navigation device which is not complex to use.
- Users wanted improvement on response time to their queries.
- There was an appreciation for an improved new system from the current.

3.2.3.1 Advantages of Questionnaires

- The preservation of consumer confidentiality made it feasible to acquire relevant information.
- Users had been capable to categorical their opinions on the blank spaces that have been provided inside the questionnaire.
- It was once fairly cheaper than conducting interviews.

3.2.3.2 Disadvantages of Questionnaires

- Misinterpretation of some questions led to incorrect answers and some questions would be left unanswered as they would seem ambiguous and unclear to the respondents.
- There was lack of non-public conversation between the researchers and the respondent and the responses took a longer time than anticipated to return. Some questions were left un-attended.
- Questionnaires lacked validity.
- There used to be no way to inform whether the respondents are being honest in answering questions.

3.3 Current System Analysis

Current system analysis affords a brief description of the current system displaying how the device works and declaring the strength and weaknesses of the manual system that is functional as of now. The defects of the modern system are outlined to enlighten or support the reason for the new proposed system.

3.3.1 Current System Description

Trevor Dollar is a real estate enterprise that lists residences that are for sale or rent. Within the technique of recording properties various techniques are executed and these encompass the first manner of registering the clients into the system and this is done by the administrator. Upon the introduction of money owed the user will now be able to make property inquires. The listing officer lists all the residences that would be equipped for rent.

After listing a property, valuation of the property will be carried out so as to determine the price of the property so negotiation are to be accomplished for commission that the association will get from advertising the client's property. Proceeding valuation procedure there is title deeds affirmation and pricing of the property so that it receives shortlisted for either renting or sale.

Clients involved in the shortlisted property will then go to pick out the rightful property that satisfies their needs and an agreement will be reached both for selling or rent consequently lease agreements will be signed and confirmed. Lastly transaction for sale renting is done with alternate of banking details and as soon they are demonstrated the property will be handed to the client.

3. .4 Process Analysis

Process analysis is typically used to enhance perception of how the process operates, and to determine conceivable aims for method enchantment through disposing of waste and increasing efficiency (Dennis, 2011). Below is an activity diagram that shows the above description:

Inputs of the modern system

- Property Details
- Client's details
- Agent's important points (name, telephone number).

Processes of the current system

- Data Collection
- Property Evaluation
- Valuation and Pricing
- Payments
- Property Shortlisting

Outputs of the existing system

- Receipts
- Tittle Deeds

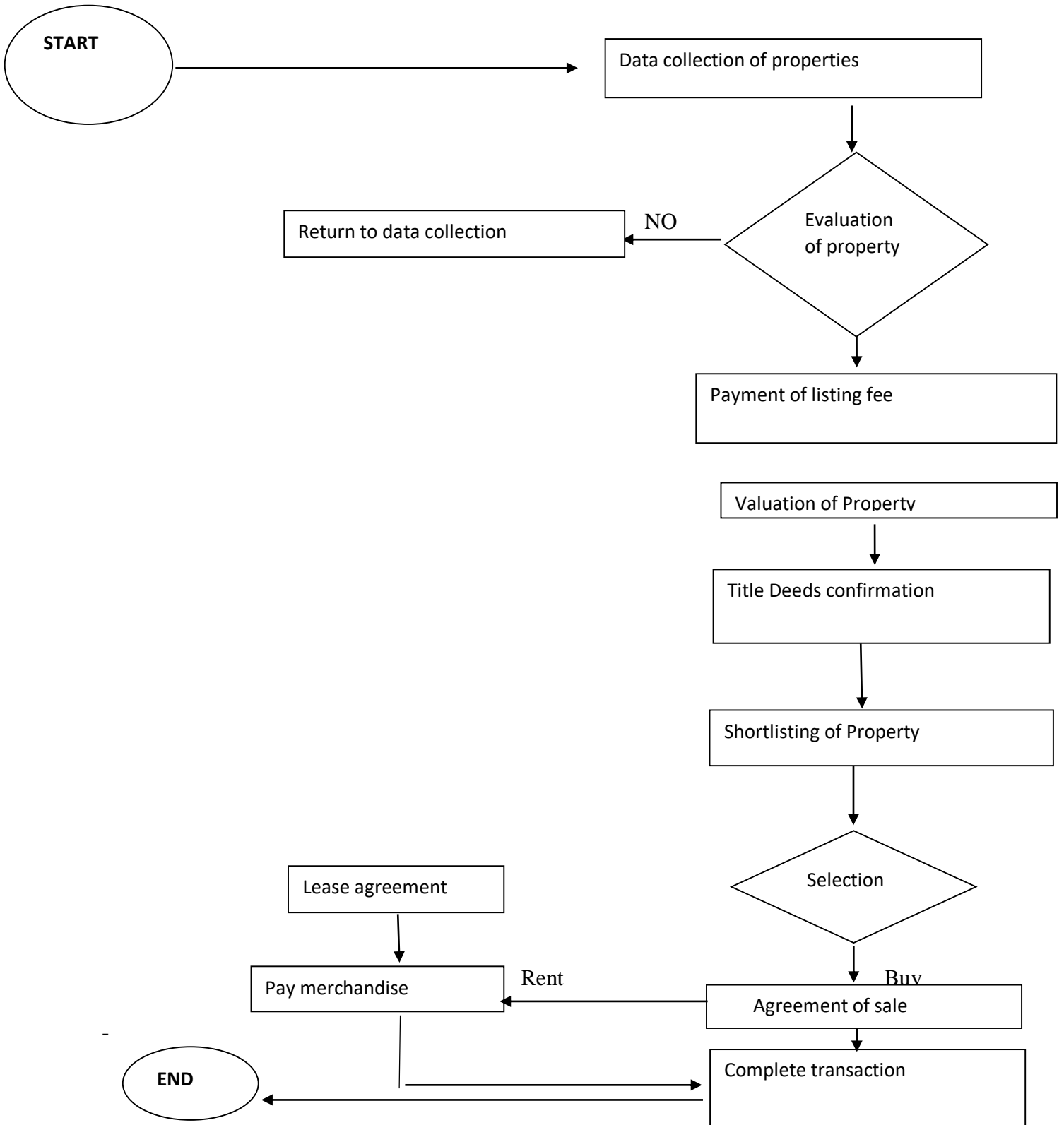
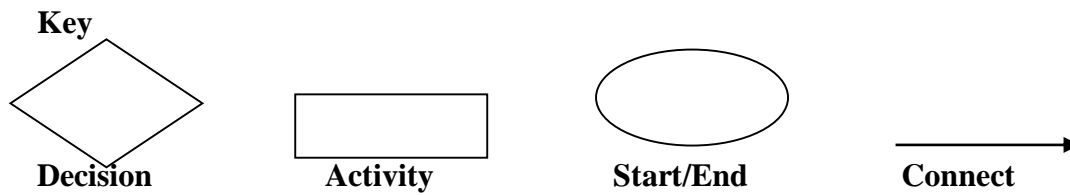


Figure 3.1 Current System Activity Diagram



3.5 Data Analysis

Godfrey (1999) advocated that statistics analysis is a method of cleaning, inspecting, modelling and reworking information with the purpose of emphasizing on useful information. To denote the inputs, processes and outputs of the current system, a context and data flow diagrams can be used.

3.5.1 Context Diagram for the Current System

Context diagrams exhibit the movement of facts in a data system and how its approaches are interrelated (Scot, 2010). It includes solely one process node (process 0) that generalizes the features of the entire system in relationship to exterior entities (Alexander and William, 2011).

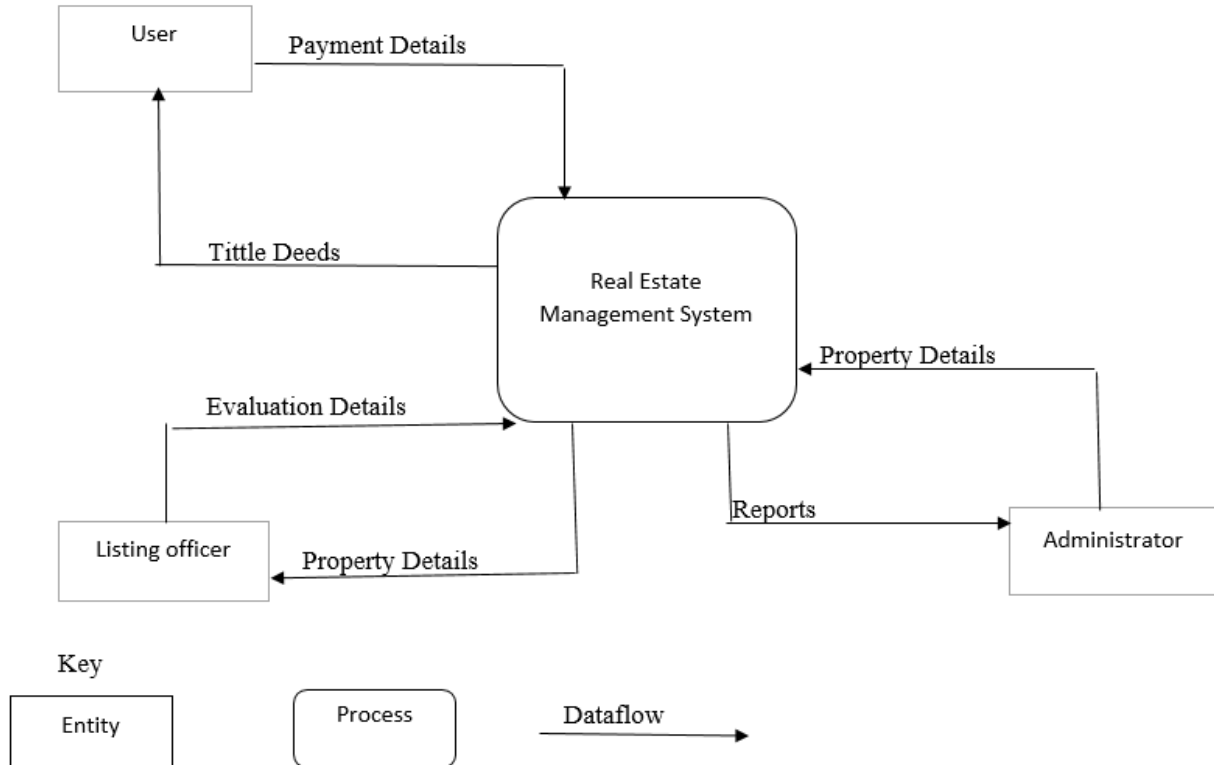


Fig 3.2 Context Diagram for the existing system

3.5.2 Dataflow Diagram for the current system

According to Maracas (2001) a data flow diagram is depicted as a tool that represents the system processes, functions and the motion of data that are inside a designated device periphery. Whitten et al (2004) defines a data flow diagram as a low stage diagram that shows the in depth of motion of statistics inside a system and all the processes accomplished through the system. The data flow .

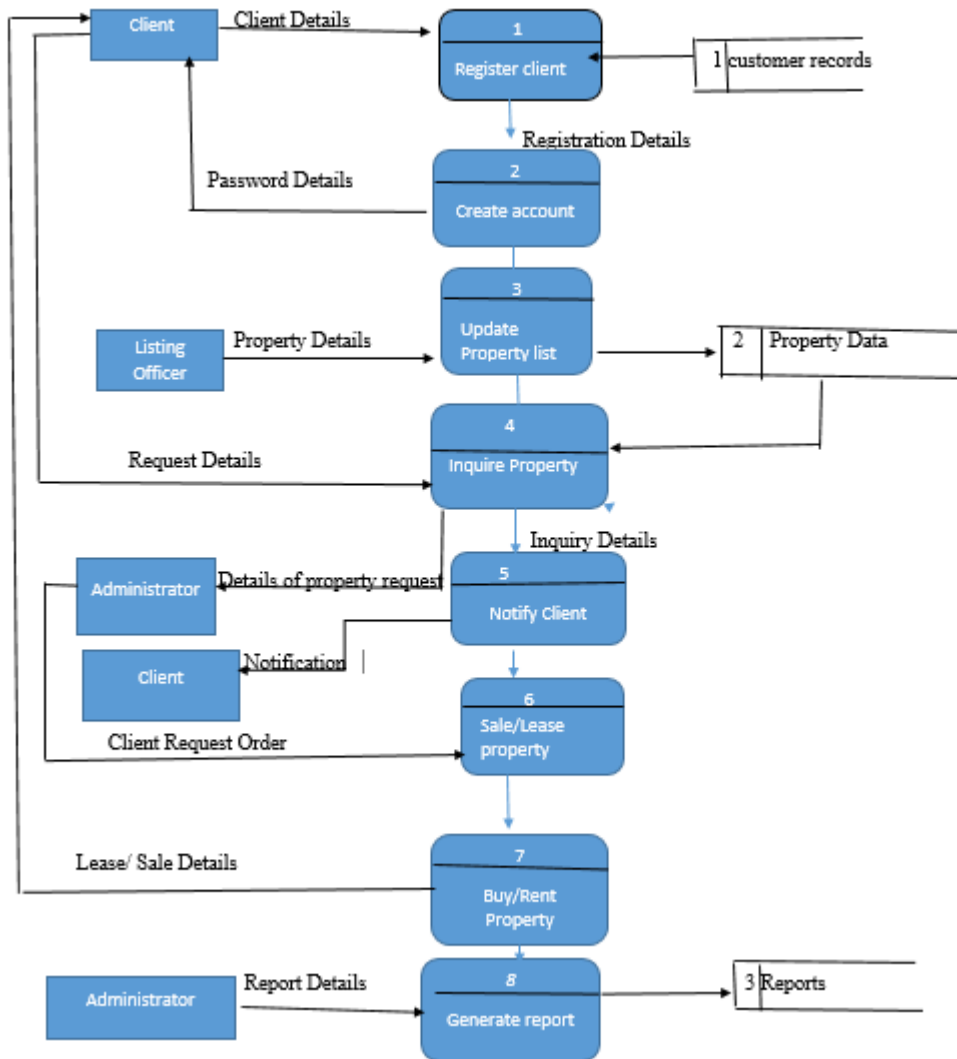


Fig 3.3 Dataflow Diagram for the existing system

3.6 Current System Weaknesses

The above table illustrates that low-priced choice to undertake is the in-house alternative, due to the minimum expenses that will be forwarded to development and upkeep as the IT group will be capable to without difficulty hold the system, involvement of user in every stage of the system improvement made it much less high priced in the course of education and induction of the new system.

- The system does not have a centralized database that stores all properties offered or rented.
- The device does not supply details of property being marketed for sale or renting to all property seekers.
- No notification is given to the new homes on the listings.
- Property seekers spend extra time searching for properties as advertising platform is scattered.
- Time taken from gaining access to a property listed is too lengthy subsequently system is time wasting and tiresome.
- A great deal forms as all the small print is recorded manually.

3.7 Evaluations of Alternatives

There were exceptional alternatives of sourcing when thinking about creating a new system relying on the prices and time span of the system needed. These alternatives included outsourcing, improvement and in-house development. The developer consulted Trevor Dollars management on the evaluation of these choices in sourcing the software that will solve the modern problems. These selections were evaluated through the use of the feasibility study to deduce the one which is to be most appropriate, cost effective and shorter existence cycle.

3.7.1 Outsourcing

Mellis and Herzworm (1996) states that software program outsourcing is improvement of software program that would be executed outside a company accordingly the time period outsourcing.

Outsourcing is usually achieved when enterprise wishes expertise or abilities that are no longer inside their personnel so as to clear up their problems. Below are motives why Trevor Dollar should not consider outsourcing the system:

- At Trevor Dollar there are experienced staffs that have the required expertise to advance the software.
- Outsourcing is pricey in phrases hardware and software as it requires external support.
- Integration of the new and present system as well as the configuration can be difficult.
- It does not guarantee the protection of Trevor Dollars information because the statistics might be without difficulty hacked through the developer.
- Outsourcing capacity that Trevor Dollar can also have less direct oversight and control of the product or service it's purchasing, which can threaten the relationship between the group and its customers

3.7.2 Improvement

According to Hoffer et al (2002), explained it as a state of affairs the place the existing system is always upgraded by way of including new elements or revolutionary components to it. Improvement is completed in order to meet the stakeholder's desires which are continually dynamic. Improvement was once going to be relevant if the agency had adequate sources to meet the altering desires and desires of stakeholders. Below are motives why Trevor Dollar need to now not think about gadget improvement:

- It's challenging to completely remove blunders in particular if the improvement system is performed by inexperienced developers.
- Continually upgrading the device raises extra processes, things to do and wishes more people ensuing in increasing the business enterprise expenses.
- In long run, these troubles will come again.

3.7.3 In-house Development

According to Setende (2012), this is when management makes a selection to preserve at least eighty percentage of the IT budget internally after evaluating the IT services markets In house improvement offers a more cost effective answer than opting for outsourcing or device

improvement as these choices enlarge the cost ranges of the company. Listed under are motives why it was once agreed upon via the team to employ in-house development as the great options were.

- The level of customization is the biggest gain of customized software. While business bundle may additionally suit many of your company's needs, it is doubtful that it will have the identical efficiency as customized software.
- In house improvement gives greater control, which is necessary if your commercial enterprise has particulars that your average business product can't fulfil.
- Because in-house software is developed by means of a crew of your choosing, it additionally provide you access to knowledgeable support. Rather than dealing with technicians who may additionally no longer recognize your unique situation, you can get aid from the people who have developed your software first hand.
- In-house improvement serves as a platform for staff training and development.
- It enabled users to feel the control of the system due to the fact it is situated on consumer stipulations and requirements.
- Reduces consultation fees.

3.7.4 Alternative Selection

With the various alternatives available, in-house improvement was chosen to be the most excellent alternative after it was once unanimously agreed upon by the administration and the analyst as it overcame all the modern system issues tons higher than others. In-house development provided the following features, accordingly thus makes it phenomenal necessary to be selected.

- Easy in upgrading and keeping the system inside the business enterprise if the need arise
- Very easy to integrate the system with consumer requirements and specifications from other departments.
- Customization of the system reduces expenses like consultation that are accrued when outsourcing. two

Table 3.1: alternative selection table

Outsourcing	5000
Improvement	3500
In house Development	2000

The above table illustrates that low priced choice to adopt is the in-house alternative, due to the minimal costs that will be forwarded to improvement and preservation as the IT team will be able to without difficulty maintain the system, involvement of consumer in every stage of the system development made it less high priced in the course of training and induction of the new system.

3.8 New System Requirements Analysis

Kotonya and Sommerville (2008) defines requirements evaluation as those duties that determine the wishes or conditions to be met for new or altered projects, taking into consideration of the opportunity conflicting requirements of all stakeholders, analyzing, documenting and managing software or system requirements. For the undertaking to be a success, necessities evaluation is critical. They are additionally subdivided into two categories which are Functional and Non-functional requirements evaluation (Hay, 2003). . The essential aim of requirements analysis was to address the challenges of the current system which had been distinctive earlier

3.8.1 Functional Requirements

Wiegers, (2003) states that functional necessities pronounce the behavior of the system as it relays to system's functionality. Functional necessities are precise and specific in system design (Karl and Joy 2013).Functional Requirements of the proposed system are as follows:

System Database backup and recovery- Backing up of the data must be probably and finished periodically and device restoration should additionally be possible in case the device crushed.

Database Centralization-To enhance safety of data in the database, records should be saved in one central storage, which will decrease the threat of data alteration and manipulation.

Reports generation- The system ought to produce periodic reviews that will be used by system administrators in decision making process.

System Validation and Verification-Only authorized system users be allowed to have access to the data in the database.

User bills security- Every device user ought to have a separate account where they can log in and be able to update their bills and change their passwords and usernames.

3.8.1.1 Use case Diagram for the current System

Jacobson et al (2011) argued that use case is a functionality the user need from the system. Below is a use case diagram for the current system.

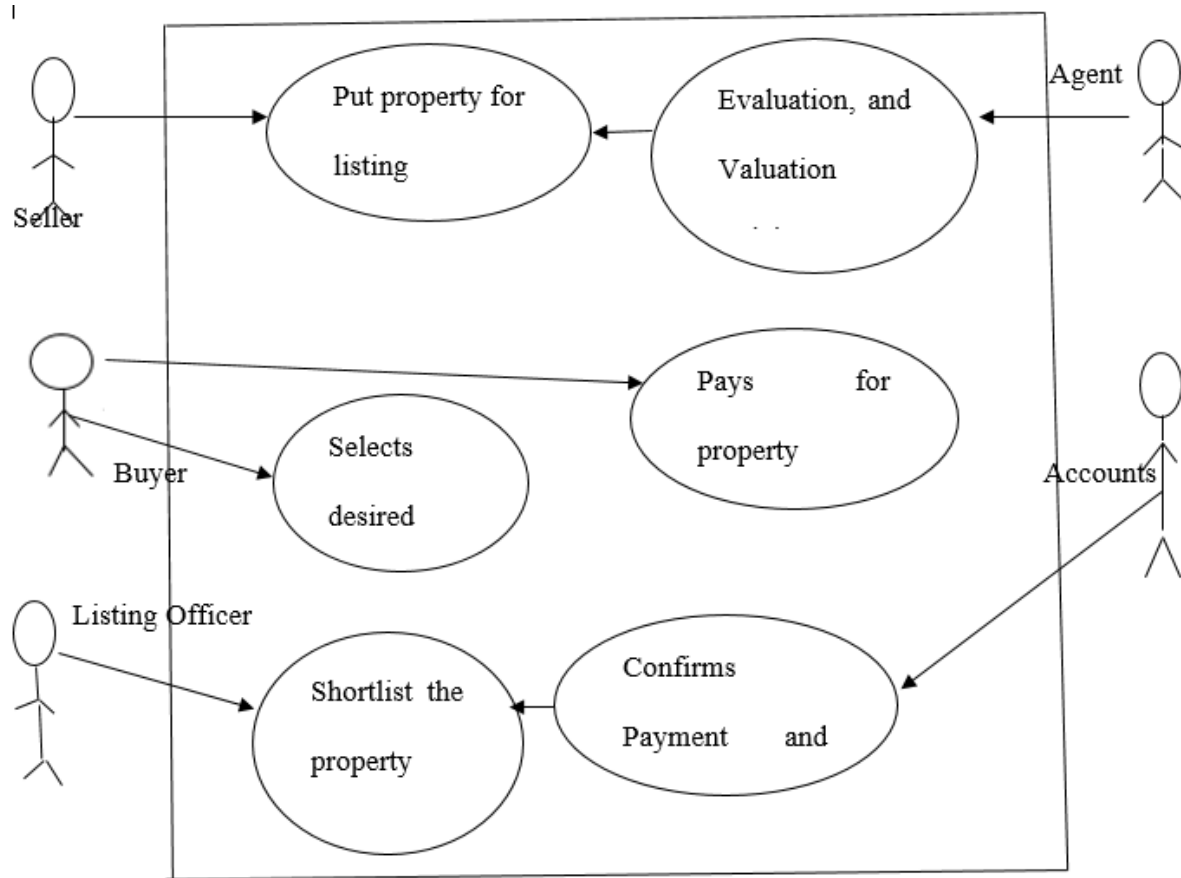
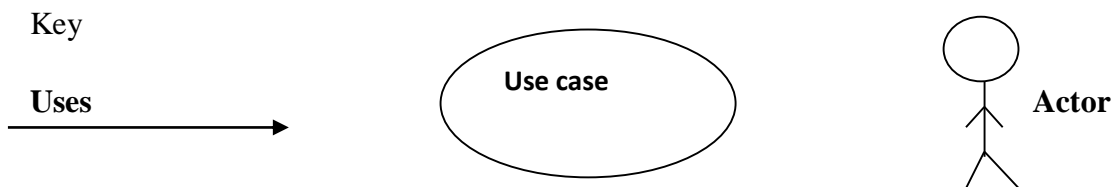


Fig 3.4 Use Case Diagram for the current System



3.8.2 Non-functional necessities

Non-functional requirement explains the performance attribute of the system, (Stellman and Greene, 2005). Explains the features of the system that do not relate to its execution, but rather to its evolution over time. They are additionally known as secondary utilities that the system is entitled to meet. The non-functional necessities that the new device need to possess are.

Extensibility -System be given room for expanding, adding new elements and carry-forward of customizations at next main version upgrade.

Fault tolerance-The new system has to make it viable for operational machine monitoring, measuring and management to be done.

Quality-Proposed system ought to also make it simple for faults discovery, delivery and faults removal.

Recovery- Time for information restoration after the device fails be limited (Mean Time to Recovery-MTTR).

Reliability –The new system lower the time between failures or availability.

Usability-The new system need to be very convenient to use through the goal community.

Efficiency-The new gadget should minimize aid consumption for a unique load.

Accessibility-System customers need to be capable to get right of entry to to the machine at any given factor in time

User-friendly - The interface should be handy and easy to research and use while having a vibrant and understandable consumer interface.

Compatibility – The new device must be well matched with any windows applications, can open up to any internet browser and to any working device.

3.8.3 Constraints

- The machine need to now not be multi-tasked together with different activities.
- Technician are needed to assist in the improvement and preservation of the new system.
- The system needs to be updated periodically and continually take a look at for updates

3.9 Conclusion

An analysis of the current system was thoroughly done providing information on how the system functions and all the processes involved. The information gathering methods that have been used to achieve relevant data have been mentioned and explained in line with how they were carried out in this undertaking alongside with their advantages and disadvantages. The existing system was analyzed through the use of context, activity, and dataflow diagrams which have been beneficial in the groundwork for the new system. In-house development was the best alternative chosen to develop the new system. New system requirements had been mentioned and the constraints related were discussed. The next phase is the designing phase which will center on the designing of the new machine and all the data representation of the new system.

CHAPETER 4: DESIGN PHASE

4.1 Introduction

The design stage outlines how the proposed system is developed, configured and deployed. The design phase offers an outline of the system design that demonstrates how the proposed system operates through the use of a context and dataflow diagrams, architectural design that will elaborate the structure of the system. Entity Relationship Diagrams will be used to exhibit the database design. The software design, interface design and system security will additionally be carried out in this chapter.

4.2 System Design

System design entails meeting the user's specification by way of making the modules, components and interfaces meet necessities (Epping .2008). In essence, system design explains the construction of the entire system and the architectural scheme which consisted of many mechanisms that commenced from the dispensation elements till the completion of the design. Below are a set of traits that had been anticipated from the new system:

- Reliability: the device is anticipated to operate barring complication. Reliability is to be improved through system availability that is the system will be on hand 24 hours a day.
- Maintainability: the proposed system is effortlessly maintainable as it is not too complex to rectify problems. The system can effortlessly be modified to adapt to changes needed by means of the organization.
- Compatibility: the system can without difficulty run on many platforms making it well matched to many environments of operation.
- Effectiveness: a design to enlarge ease of processing, accurate insurance plan and dealing with of many insurance plan archives processing is done.

4.2.1 Proposed System Overview

- A client for the first time creates an account on the system portal and goes through a once off process of populating all the required important points such as full name, ID number, contact details and desired username and password.
- A management level consumer cannot create his/her very own account and this can solely be executed with the aid of the device administrator assigning sufficient rights to the system.
- The Real Estate agent additionally cannot create their very own money owed and this is performed by way of the administrator assign adequate rights to the account.

If the client account already exists on the system, the person logs in with his/her unique username and password and upon profitable login the person is redirected to the system dashboard the place all the property details are mechanically populated from the user's profile. Android applications are composed of one or greater utility aspects activities, services, content providers, and broadcast receivers. Each aspect performs a special position in the normal application behavior, and everyone can be activated in my opinion even by way of other applications.

The manifest file has to declare all aspects in the software and ought to additionally declare all software requirements, such as the minimal model of Android required and any hardware configurations required. On code utility assets (images, strings and layout archives have to encompass options for unique gadget configurations such as one of a kind strings for unique languages.” The major factor for proposed system will be to permit property seekers to search for preferred houses using distinct specs after doing so the machine will automatically calculate the interest and deposit to be charged. Property proprietors also get to recognize the price of their properties. Below is the context and the statistics waft graph for the proposed system:

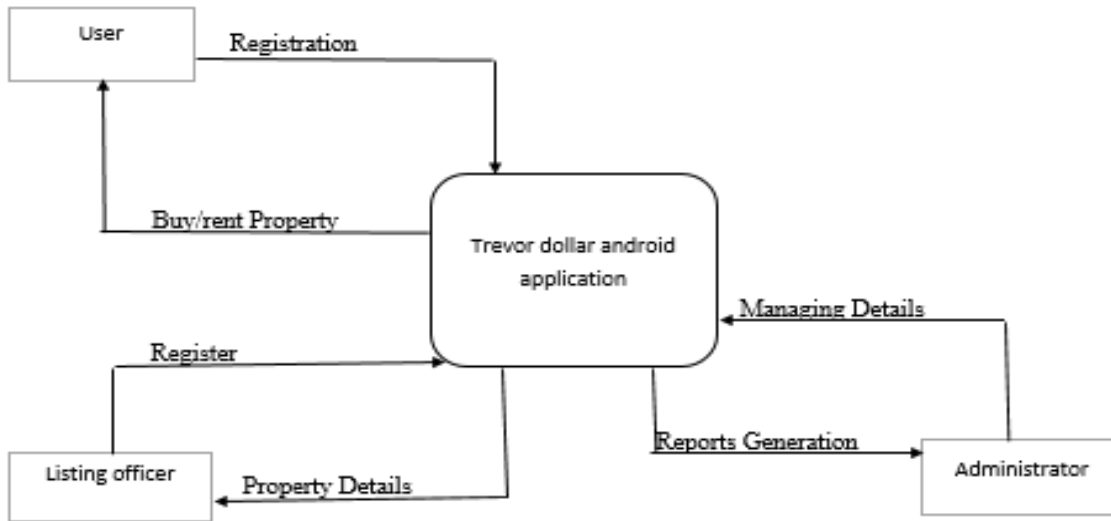


Figure 4.1: Context diagram for the new system

Key



4.2.3 Data Flow Diagram for the proposed system

According to Maracas (2001) a data flow diagram is depicted as a tool that represents the system processes, functions and the motion of data that are inside a designated device periphery. Whitten et al (2004) defines a data flow diagram as a low stage diagram that shows the in depth of motion of statistics inside a system and all the processes accomplished through the system. The data flow diagram for the proposed system is below.

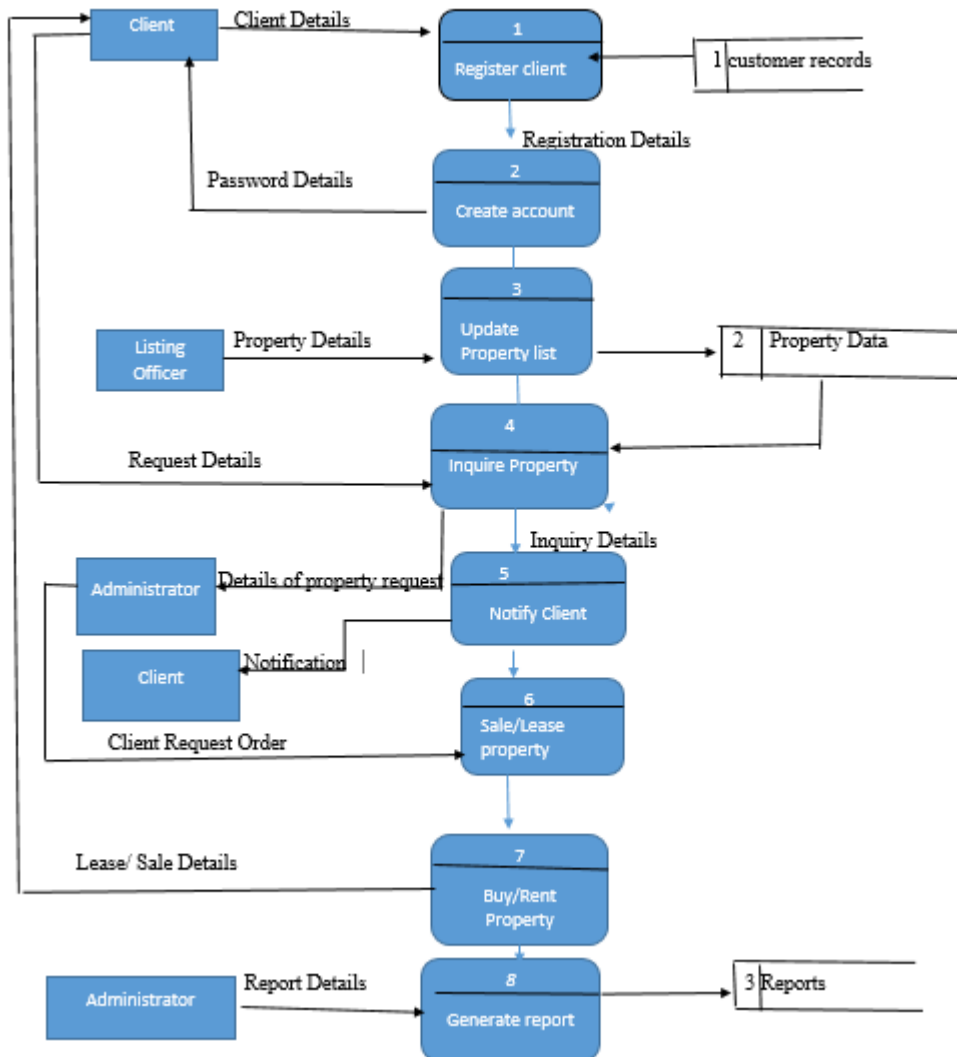


Fig 4.2 Dataflow Diagram for the proposed system

4.3 Architectural Design

Business Dictionary (2015) defines architectural layout as the idea that it focuses on aspects or elements of a structure that a gadget unifies into a comprehensive and useful whole, in accordance to a specific methodology used to acquire the targets beneath the given limitations, According to (Monica 2009) architectural layout offers a description of the surroundings in which the device will run in. There for structures architecture is of incredible significance as it unifies the system buildings that are described in terms of systems elements, processes, interfaces and constraints of the system. Static architectural plan model used to be used this is so because it has the capability of displaying all the system factors with their relationship to every different in the new system, the consumer –server strategy was adopted to develop the system.

4.3.1 Client-Server Approach

This method integrated has a committed influential server with the reason of administration of the disk network servers and drivers print servers. The server is surrounded by client r which consists of Personal computer systems or workstations which requests resources from the servers. The consumer server architectural design for the proposed systemt has got the following elements:

- Database Server – this is the place all companies records need are stored
- Web server – this is where the graphical person interface and net pages are located and additionally they are retrieved on the browser
- Client machines- speak collectively even as asking for data from the server.
- Local Area Network cables – used to connect clients and the hub in a network

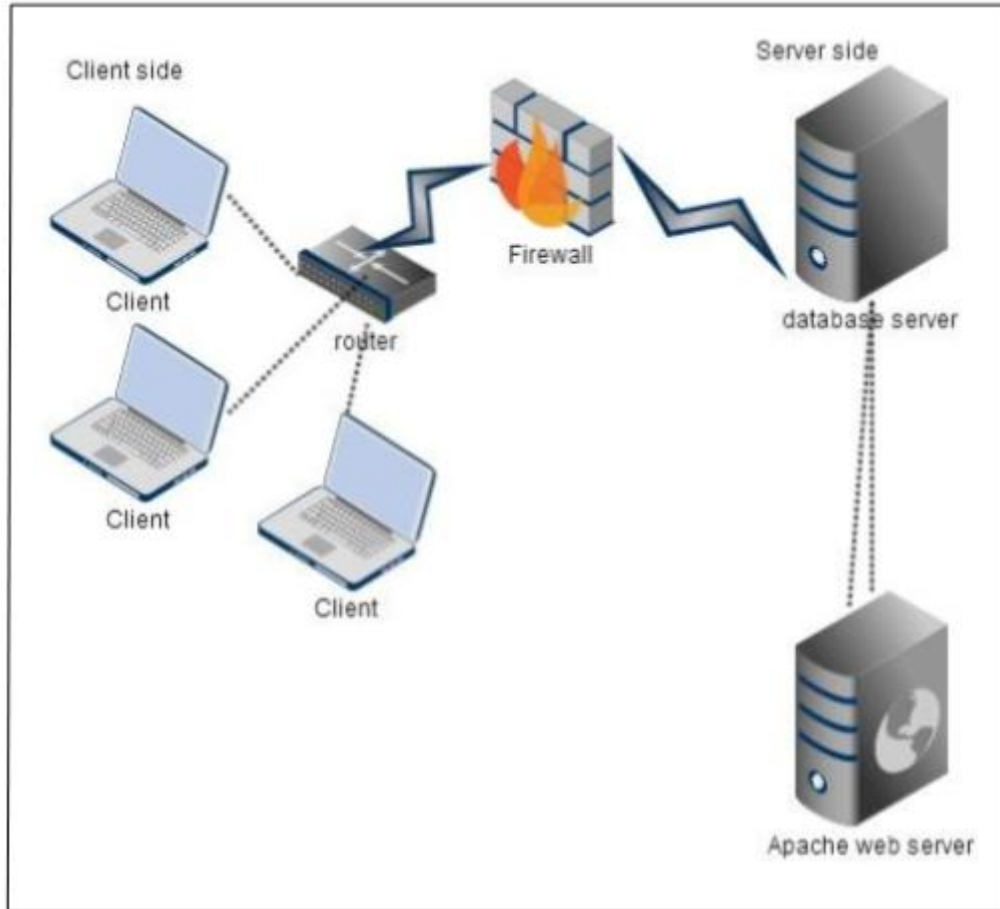


Fig 4.3 Architectural Design (adapted from Somerville' 2004)

4.4 Physical Design

It is the interplay of the hardware and software program elements via the network inside the business (Coronel and Crockett, 2008). The system is to be accessed by using network linked to the internet. Physical Design also enhances the translation of logical mannequin of the system to the physical model of the system and offers an out layer on how they are built-in to the database server. . The new system's physical design consists of countless consumers with desktops where the updating of the device is completed by the administrator and real estate property agents. These computers are related to a router that translates information to the database server which has the responsibility of manipulating the complete operations that are achieved for instance deleting, updating and retrieval of statistics in the database.

The firewall that is between the system server and the router assist in defending the transitory of virus and malware from the internet. There is a printer which is linked for reports printing. Below is the new gadget bodily design:

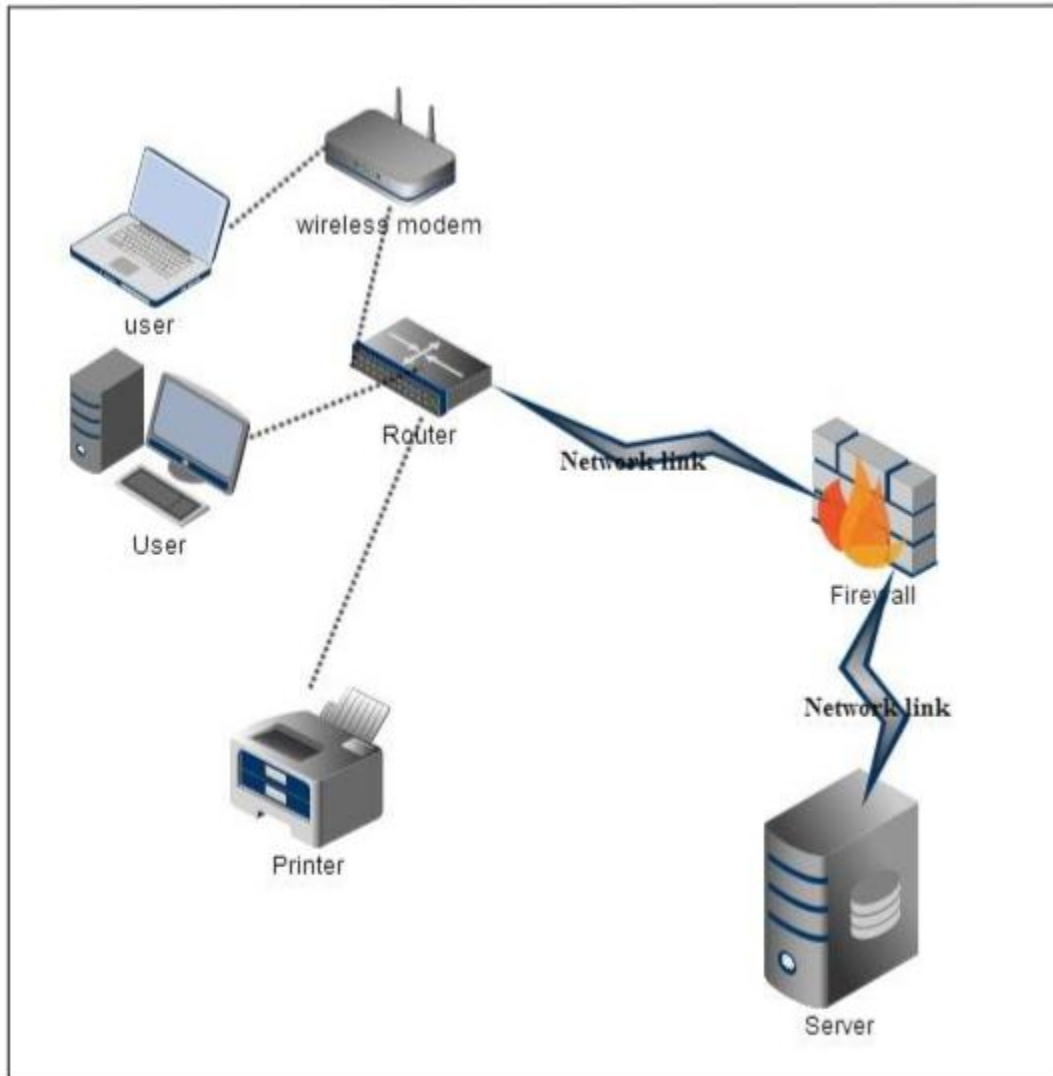


Fig 4.4 New System Physical Design (adapted from O'Brian, 2006)

Fig 4.4 New System Physical Design (adapted from O'Brian , 2006)

4.5 Database Design

Teorey et al., (2009) states that database design is the process of impending up with a detailed data model of the database system. The entity relation data model (ERD) permits the description of data intricate in real-world enterprise in sense of objects and their relationships. Provision of useful concepts that allows developers to shift from an informal description of what users request from their database to a more detailed, exact description that can be employed in a DBMS. Information about listing properties will be stored centrally as the system uses database management system (DBMS) in comparison to file based system and will allow information access to the property owners, property seekers and the Trevor Dollar. The use of a DBMS in the proposed Trevor Dollar Property Listing Android Application is due to the following reasons:

- Central DBMS helps information access concurrently
- Also enhances data security through the use of user privileges and verification codes
- DBMS ensures no data redundancy thus achieving integrity

4.5.1.1 Database Architectural Design

According to Meyers (2007), database architectural layout is a manner that manages collections of guidelines and protocols concerning on how well statistics is saved in the database even as enforcing some constrictions on the right to entry on data through unauthorized users. The ANSI-SPARC mannequin used to be used which has three discrete schemas particularly the external layer, conceptual layer and the physical layer.

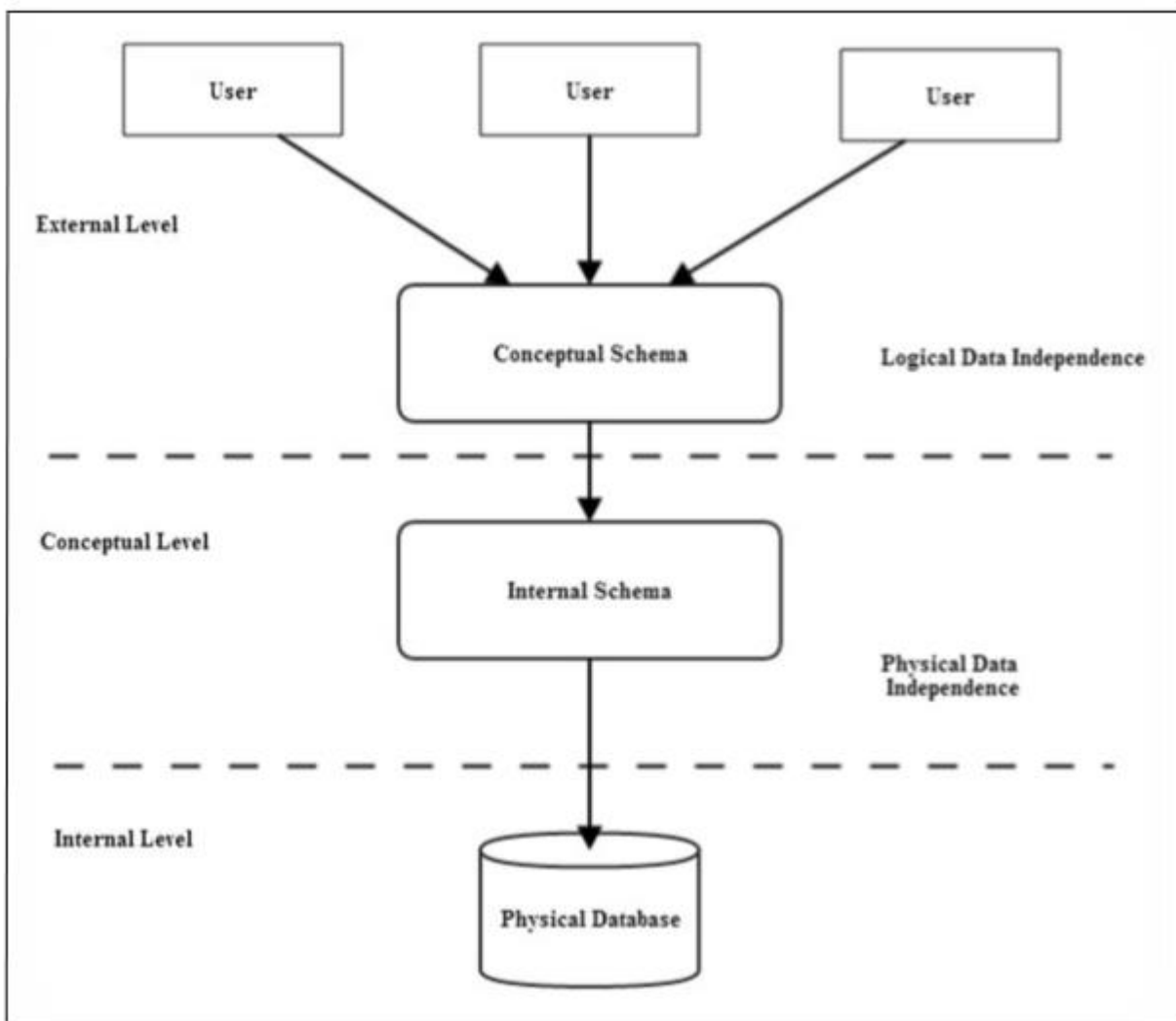


Fig 4.5 Database Architecture Design

4.5.1.2 External Schema

This is the uppermost stage of the mannequin and it contains of a customized view for the stop users (Meryers 2015), This level is paramount as it leathers the way records is kept in the database to the final consumer however permitting these quite a few customers to view the same statistics in unique approaches e.g. the interface shown to employers is special from the one proven to the purchasers even even though the facts is the same.

4.5.1.3 Conceptual Level

This degree represents the neighborhood view, for that reason it indicates how the database is structured logically. It additionally indicates the relationship between the statistics participants of the database, precisely what information is stored in it and what consumer will need to use the database (Coronel and Crockett, 2008). It helps cover the complexity of the database and additionally hides how the statistics is bodily stored in it. Moreover it gives a global view of the database, as nicely as the hardware and software program imperative for going for walks it.

4.5.1.4 Internal Level

This stage deals with how the saved data in the database is represented to the user. This stage indicates precisely how the facts is saved and organized for easy access on the device (Somerville, 2008). This is the most technical level, it additionally includes figuring out the right house allocations techniques, statistics compression techniques, protection and encryption and the get right of entry to paths the software program can take to retrieve data.

4.5.2 Logical Database Design

Teorey et al (2005), states that logical database sketch is the conceptual, summary layout that includes arranging records into a collection of logical relationships known as entities and attributes. The first factor of understanding in logical database graph is the consumer necessities and to truly create a technical solution for the machine which commonly consists of tables The primary keys are chosen, add correct indexes (clustered and non-clustered) and so on.

Entity Relation diagrams (ERD) is intended for logical database design, which is an prepared way of defining precise enterprise methods (Chen, 2014). The approaches are exhibited as entities and

Relationships directly hyperlink them together portraying their dependencies. Below is a table that suggests the above description.

Table 4.1 Relationship Table

Entity	Attributes	Description	Type
Property Owner	Name Surname Contact Details Type of property Access level	Owner name Owner Surname Phone Number Property ID User Privileged control	Varchar(15) Varchar(15) int(10) Varchar(15) Varchar(15)
Property Seeker	Name Surname Contact Details Type of property Access level	Seeker name Seeker Surname Phone Number Property ID User Privileged Control	Varchar(15) Varchar(15) int(10) Varchar(15) Varchar(15)
Listing officer/Agent	Name Surname Contact Address Department Username Password Access level	Officer Name Officer username Officer phone number Officer Department Officer username Officer Password User Privileged	Varchar(15) Varchar(15) int(15) Varchar(15) Varchar(15) Varchar(15) Varchar(15)
System Admin	Username Password Access Level	System Admin Username System Admin Password Privileged Control	Varchar (15) Varchar(15) Varchar(15)

4.5.3 Enhanced Entity Relationship Diagram

Sikha (2006), states that EER design is the modelling statistics at a higher level and it an extension of original entity relationship model. Enhanced Entity Relationship sketch was made to be used on highly complex databases so as to show the houses and constraints discovered in these database.

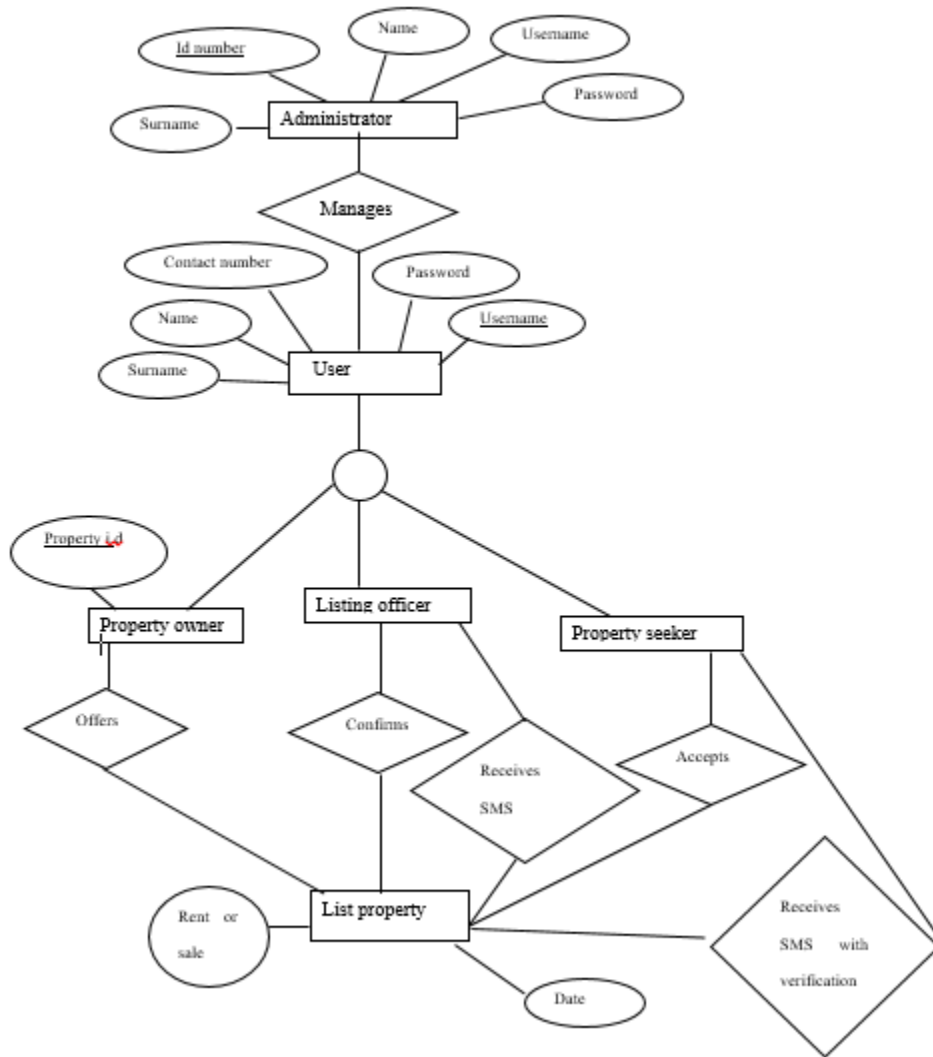


Fig 4.3 Entity Enhanced Diagram

4.6 Program Design

McGraw-Hill Dictionary of Scientific & Technical Terms, pc program improvement is when the hardware and software program resources required through the application are noted and the good judgment intended to be used by the application is referred to as application design. The diagrams under help to describe program design:

4.6.1 Class Diagram

Scott, 2009 states that class diagrams affords an outline of the target gadget through defining the objects and lessons inside the device and the relationships between them. It offers a broad variety of usages that is from modelling the domain-specific records structure to special layout of the goal system. In a classification diagram, instructions are organized in groups that share frequent characteristic

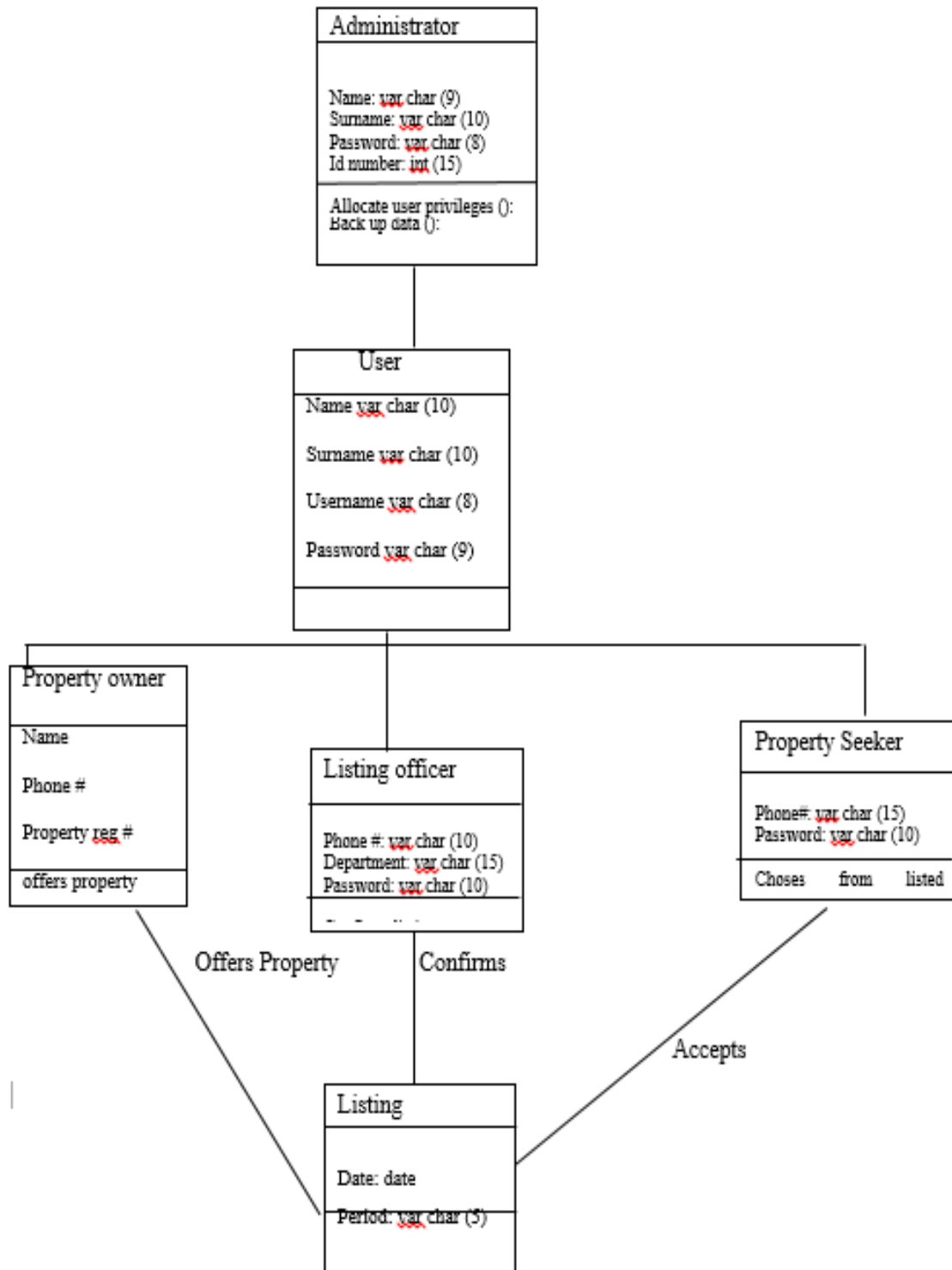
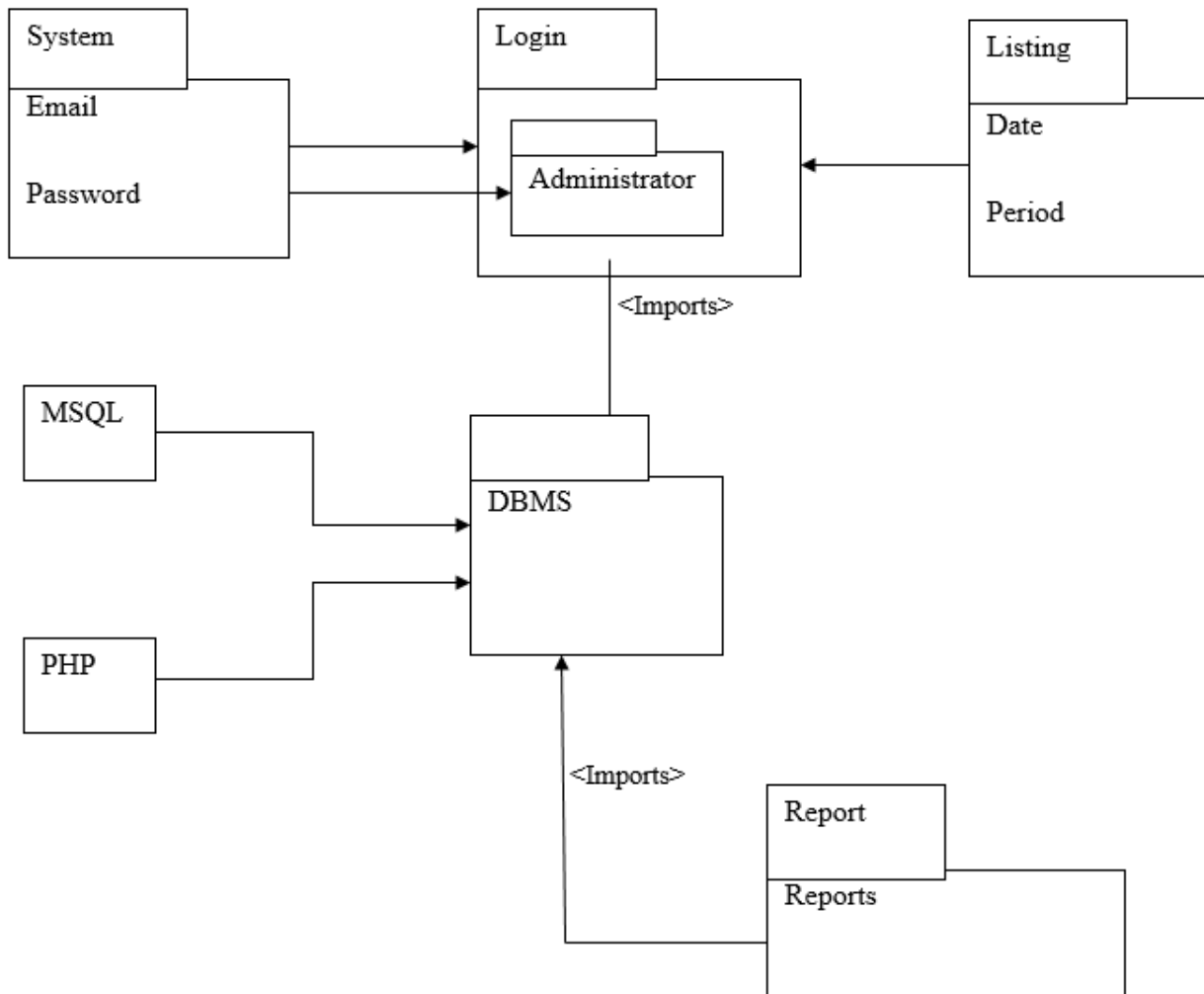


Fig4.7: Class diagram of the proposed system

4.6.2 Package Design

Rouse (2005), reiterated that the package diagram indicates system components categorized into packages that interact together to fulfil the systems specifications genuinely displaying the dependences of these elements that exists. The project team had to use the Unified Modelling Language (UML) to model the package diagram for the new system. These aspects are produced by using breaking down the complete machine unit into numerous smaller device components. Duffy (2011) stresses the point that the package deal layout is a crew of logically connected software program elements that interacts together. The package sketch for the new system is shown below:



4.8 Package Diagram for the proposed system.

4.6.3 Sequence Diagram

Aggarwal and Singh (2009) define a sequence graph as an interplay graph that suggests how objects function with one some other and in what order. It depicts the objects and training worried in the state of affairs and the sequence of messages exchanged between the objects wanted to lift out the performance of the scenario. They are additionally show the object’s lifelines and interactions in time sequences.

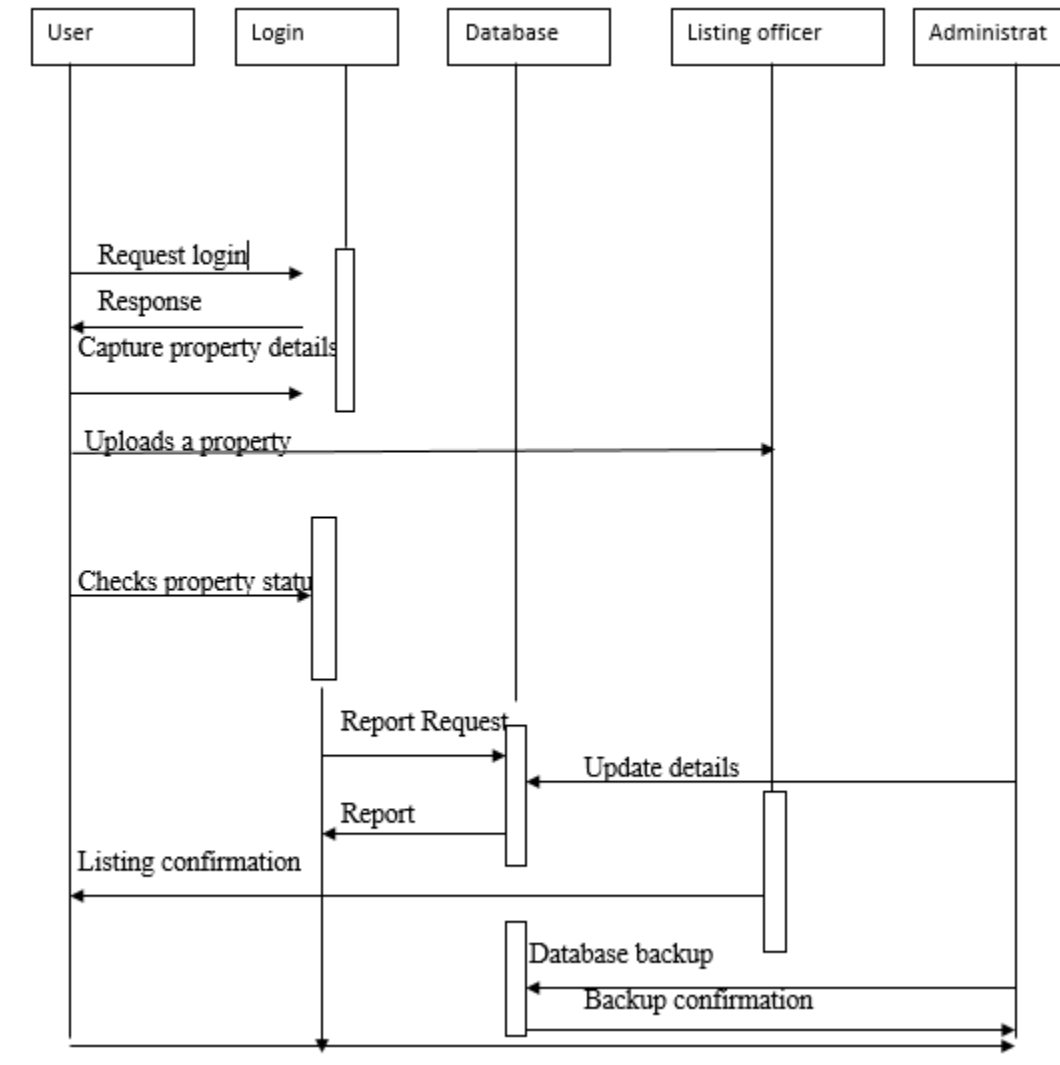
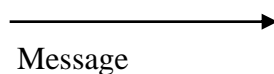
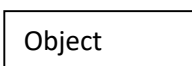


Fig 4.9: Sequence diagram of the proposed system

Key



Activity

4.7 Interface Design

As indicated by means of Norman (2002), Interface format manages the advancement of a technique for two or extra modules in a machine that empowers affiliation and correspondence. These modules possibly be in the form of hardware, software and the real interface between the computer and the client.

4.7.1 Menu design

User Interface (UI) is the result of the treated user/client inputs and is the essential interface for machine-client cooperation. GUI (Graphical User Interface) is supposed to make the gadget as simple and fantastic as may want to be allowed to machine users/clients (Wolf, 2012). A first rate UI ought to permit customers to make use of the gadget with low stages of help. The following are cilents frames that resembles .

4.7.1.1 Main Menu

The under discern indicates the texts fields in which the system users must enter their credentials so as to access the system statistics.

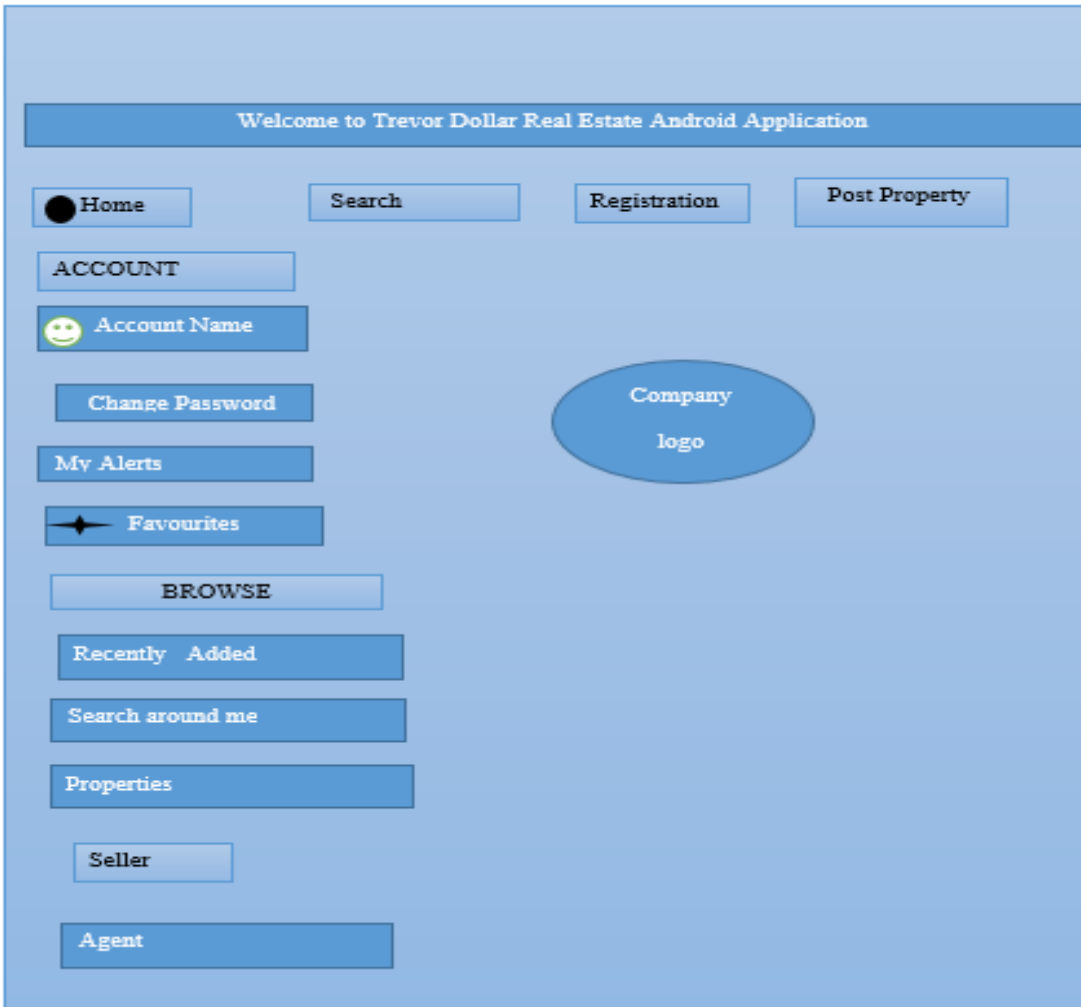
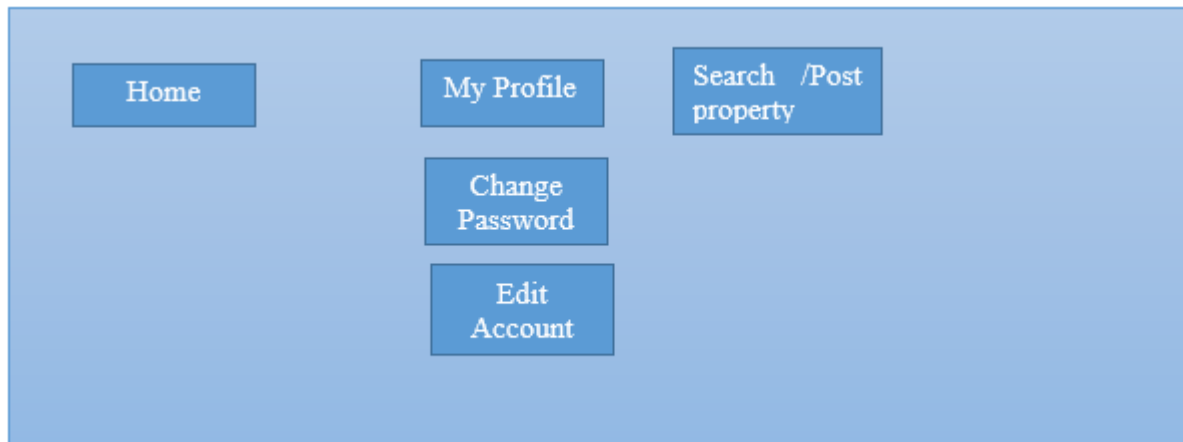


Fig 4.10 Home Page

4.7.1.2. Sub Menu

This is a secondary menu which is derived from the home page or main menu. Sub menus are user specific. The users will have a sub menu created so that their needs are met using the Real Estate Application.

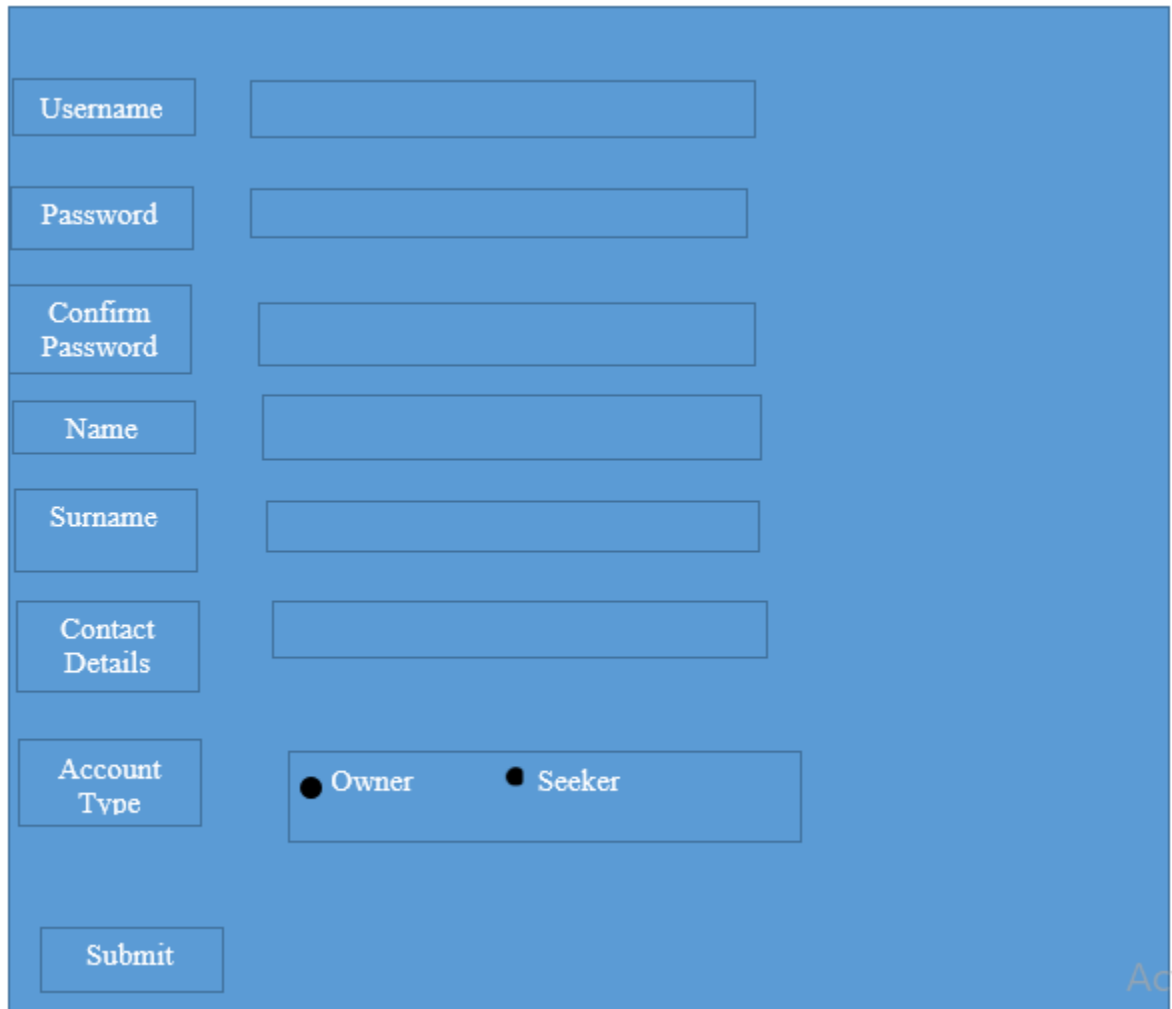


Customer Page

4.7.2 Input Design

Input configuration is a procedure of changing client passages into a robotized information system (Maier, Mark and Rechten, 2000). The input design outline is imperative in information passage to keep away from mistakes and represent how clients ought to utilize it to get precise and solid reports. Input structures are intended to be anything but difficult to utilize and easy to use.

4.7.2.1 Customer Registration

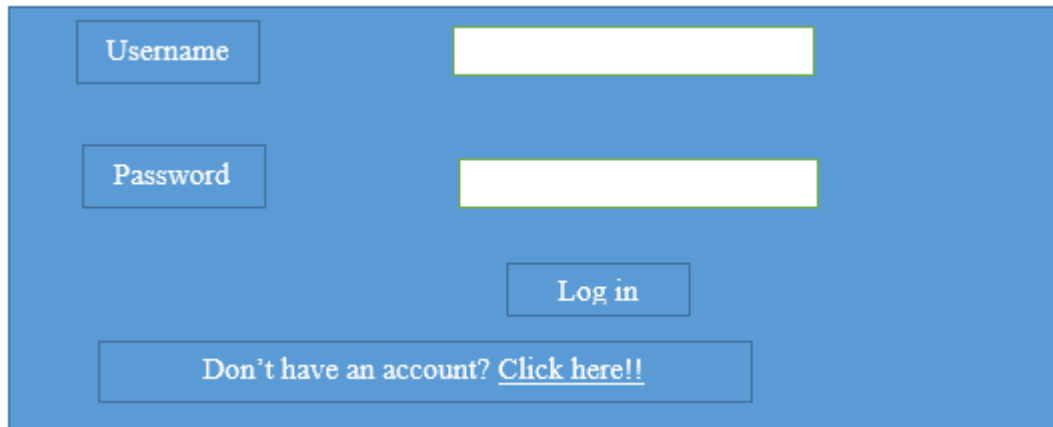


A registration form with a blue background. The form contains several input fields and a submit button. The fields are arranged vertically from top to bottom: Username, Password, Confirm Password, Name, Surname, Contact Details, and Account Type. The Account Type field has two radio buttons labeled 'Owner' and 'Seeker'. A 'Submit' button is located at the bottom left. A faint watermark 'Act' is visible in the bottom right corner of the form area.

Username	<input type="text"/>
Password	<input type="password"/>
Confirm Password	<input type="password"/>
Name	<input type="text"/>
Surname	<input type="text"/>
Contact Details	<input type="text"/>
Account Type	<input type="radio"/> Owner <input type="radio"/> Seeker
Submit	

Fig 4.12 Registration Page

4.7.2.2 Customer Login



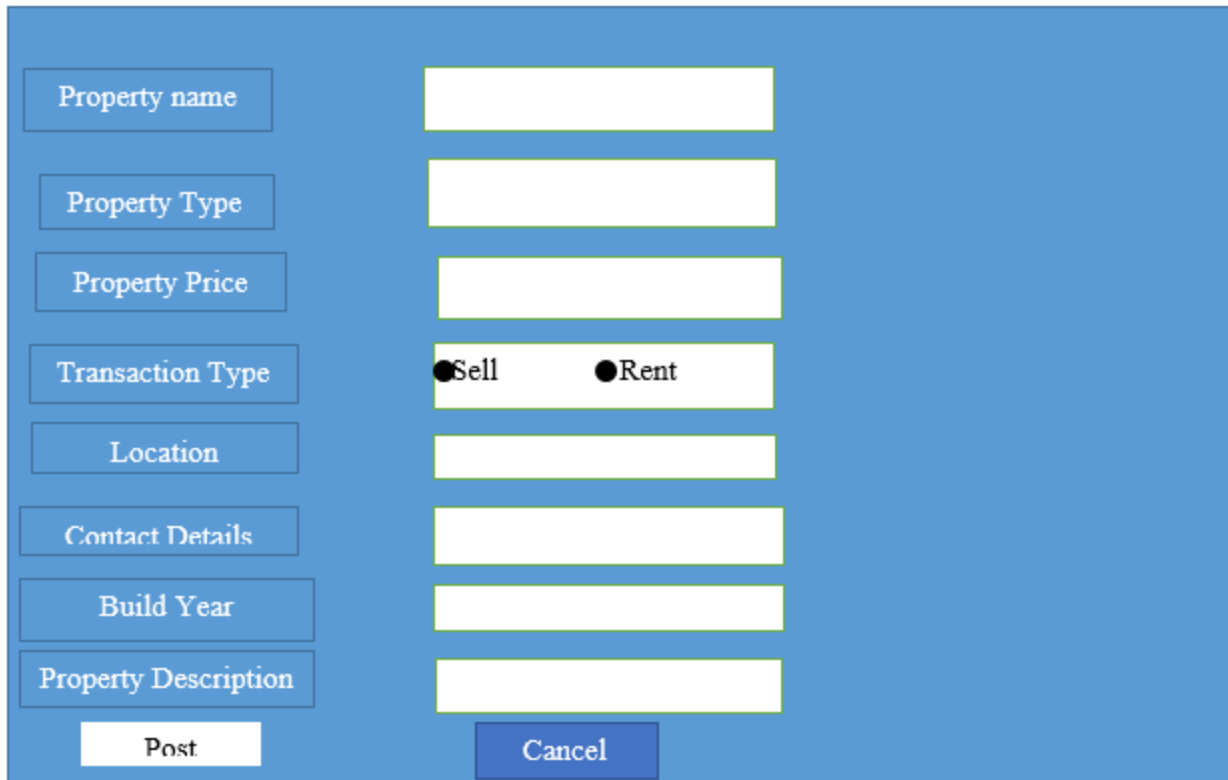
A login form with a blue background. It contains two input fields for 'Username' and 'Password', a 'Log in' button, and a link for users without an account.

Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Log in"/>	
<input #"="" type="button" value="Don't have an account? Click here!!"/>	

Fig 4.13 Login Page

4.7.2.3 Property Registration

This menu shows the text fields in which the user should fill when registering their properties with the real estate.



The image shows a property registration form with a blue background. On the left side, there are eight labels in white boxes: 'Property name', 'Property Type', 'Property Price', 'Transaction Type', 'Location', 'Contact Details', 'Build Year', and 'Property Description'. To the right of each label is a corresponding white input field. The 'Transaction Type' field contains two radio buttons: 'Sell' (which is selected) and 'Rent'. At the bottom of the form, there are two buttons: a white 'Post' button on the left and a blue 'Cancel' button on the right.

Fig 4.14 Property Registration Page

4.7.2.4 Property Search

Category Apartment Commercial Building

Property for Rent Buying

Price From Price to

Bedrooms from Bedrooms to

Search

Fig 4.15 Property Search Page

4.7.2.5 Property Listing



A screenshot of a web form titled "Property Listing" with a blue background. The form contains three input fields stacked vertically on the left side, each with a light blue border and white text: "Property name", "Property type", and "Property Price". At the bottom of the form, there are two white buttons with black text: "List Property" on the left and "Cancel" on the right.

Fig 4.16 Property Listing Page

4.7.3 Output Design

An output layout is an exquisite wellspring of statistics to the client (Maier et al, 2014). It moreover alludes to the technique for giving purchasers the records organized by way of the system. The output sketch focuses on what the machine is going to create in the wake of executing positive system.

4.7.3.1 Listing Report

This is a distinct file for Trevor Dollar that indicates all the clients, property listed as well as the prices.

Listing Report

This is a detailed report for Trevor Dollar that shows all the clients, property listed as well as the prices.

Show entries		Search <input type="text"/>		
date	full name	Property	Price	Admin
03/05/19	Tinto Mamba	Flats	300	Grace
09/05/19	Nyasha Nyanja	Cottage	100	Grace
11/05/19	Percy Vambe	Office	400	Grace

Fig 4.17 Listing report

4.7.3.2 Property Uploading Successful

The image shows a property upload form on a blue background. The form consists of several input fields and buttons. On the right side, a black box displays the message "Property successful uploaded".

Property name	Kwayedza Building
Property Type	Flat
Property Price	2000
Transaction Type	<input checked="" type="radio"/> Sell <input type="radio"/> Rent
Location	Gweru
Contact Details	grace@gmail.com
Build Year	1996
Property Description	Good condition

Buttons: Post, Cancel

Message: Property successful uploaded

Fig 4.19 Successful upload page

4.7.3.4 Successful

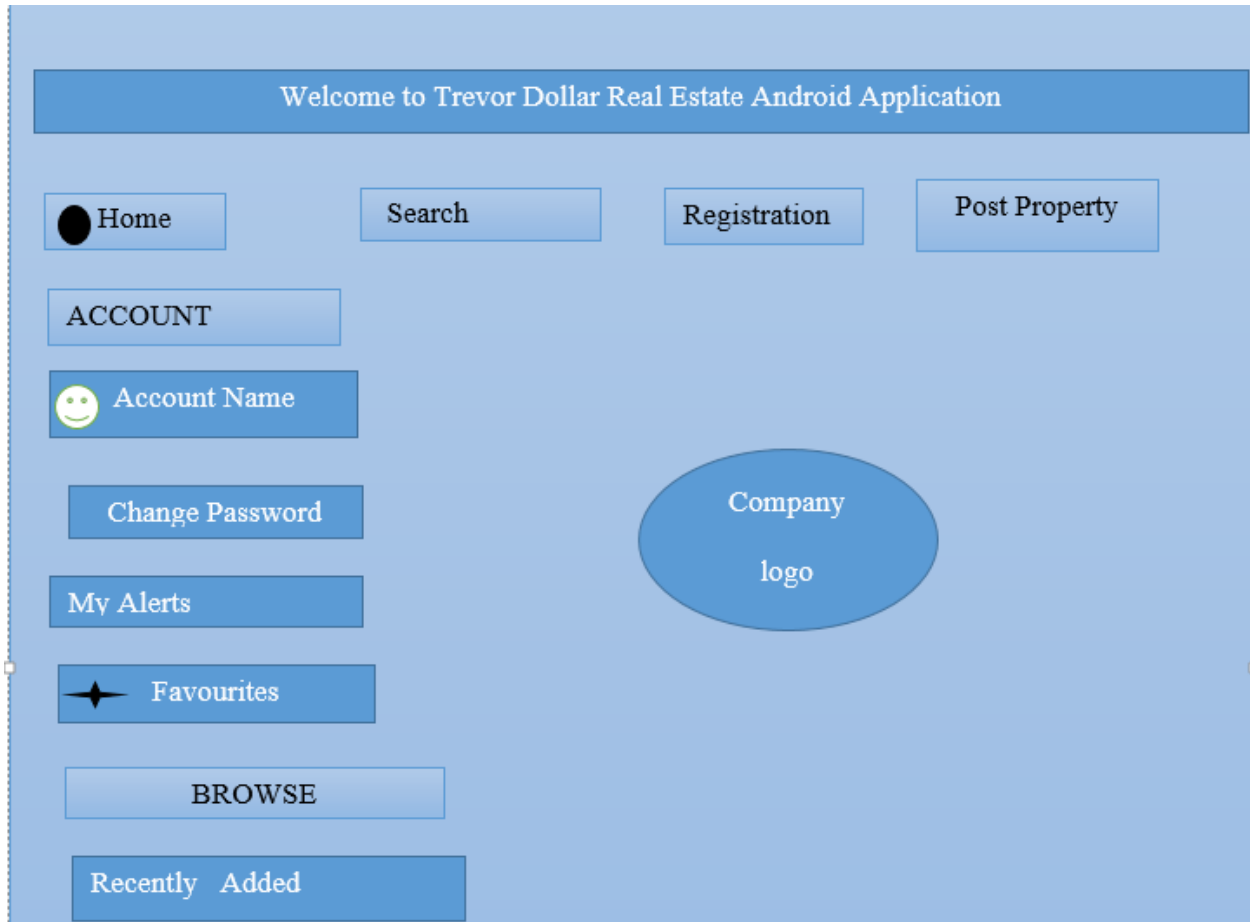


Fig 4.20 Home Page

4.8 Pseudo Code

According to Rouse (2005), this is an algorithm in procedures which may be scripted in a readable format that look like the actual codes. Below is a pseudo code

Admin Login GET Username

GET Password

IF (Username == EnteredUsername && Password == EnteredPassword) THEN

 Login Successful

ELSE

 Login Failed

ENDIF

Consigner Register GET Name

GET Surname

GET Gender

GET PhoneNumber

GET Email

GET Password

IF (Name AND Surname AND Username AND Gender AND PhoneNumber AND Email AND Password == Valid) THEN

 Registration Successful

ELSE

4.9 Security Design

Zacker (2000) described security design as the act or method of designing and enforcing measures, with the goal of reducing vulnerabilities and chance that may have an effect on the operation of the proposed machine to both hardware and software program tools. Security system is an integral factor as it prevents the system from a number of threats. However policies and approaches should be designed to guard the new developed machine from bodily and non-physical damages that may additionally avert its performance.

4.9.1 Physical Security

Hughes and Cottrell (2009) outline physical security as the prevention of tangible belongings of an employer such as property from being harmed, herbal disasters or terrorist attacks and unauthorized access to sensitive information within the computers. It additionally focuses in ensuring a safe physical environment for an statistics system. Some measures that can be employed to useful resource physical safety include the use of a number layers of reliant frameworks which encompass closed circuit tv (CCTV) surveillance, security.

4.9.2 Network Security

The safety of laptop community and all of its site visitors and resources through an agency (Kendall and Kendall, 2005). It also involves the protection of information in the course of the exchange. Network protection consists of the method of physical and software program preventive measures to defend the network infrastructure from unauthorized access. Some measures resource to the protection of a network encompass the use of an antivirus software, encryption of data, authentication and malware detection. Firewalls are also used to shield the server from Internet vulnerabilities.

4.9.3 Operational Security

Kendall and Kendall (2015) defines operational security as vulnerabilities that are in all likelihood to cause damage to the proposed machine in the course of its operational life time. The operational threats can be inside or outdoor the organization. Some of the

threats are hard to control such as fire. Hackers are additionally one of the most important threats to the device as some of the user will exposing some of the touchy information. Some methods to guarantee operational safety can be via the use of email encryption in the course of communication to counter spoofing and digital eavesdropping. The use of firewalls, antivirus safety software program and get admission to login software are the measures put ahead via the developer to make certain operational safety of the data system.

4.10 CONCLUSION.

The design stage has helped the developer to be able to come up with an organized way of how the system to be developed is going to look like. The definition on how the system works in the actual environment which encompass the specification of the components of the software, users' ease of use and easiness to preserve was alluded in this system. A comprehensive representation of hardware and software specification with the complement of data flows, Enhanced Entity Relationship Diagram, database architecture and the Entity Relationship plan diagram were used to depict the physical operation of the system. The design phase uncovered the precise appearance of the new system which encompass package deal diagram, class diagram and sequence diagram. All the menus which consist of input and output forms of the system have been depicted. The security design completed the design phase. The subsequent segment is the implementation phase contains of system coding, testing and maintenance.

Chapter 5: Implementation Phase

5.1 Introduction

The design of the proposed system was undertaken and different design strategies were looked at. These strategies included architecture design, program design and interface designs which justified development of the real estate android application. The implementation of the new system then commences. The implementation phase is concerned about the system coding, changing strategies, testing, installation and its maintenance with much emphasis on the determination on whether this system's objectives were accomplished without fail. Testing strategies include unit, module, subsystem and system testing. Several techniques will be employed to enhance the system's validity and reliability through verification and faults testing. System versus objectives will also be analysed. The system installation strategies are part and parcel of this phase, these strategies include parallel changeover, phased and direct change over.

5.2 Coding

It suggests the scripting of programming statements that use programming language which the computer can understand and result in having the source code for the program (Rouse, 2005). The system is a web based which coerced the developers to select the most helpful programming language for this system which were PHP and JavaScript. The coding session involved the following persons, administrator, developers from Trevor Dollar Real Estate the end-users. All the codes for this system are in the Appendix E.

5.3 Testing

This is a process of evaluating software products on numerous defects and correcting them as soon as they are detected (Mathers, 2000). System Testing was done so as to check if the system was operating as expected and checking if it was meeting the specified requirements. System testing was done through different techniques which include unit testing, module testing,

subsystem testing. The diagram below show the processes on how the software was tested before implementation.

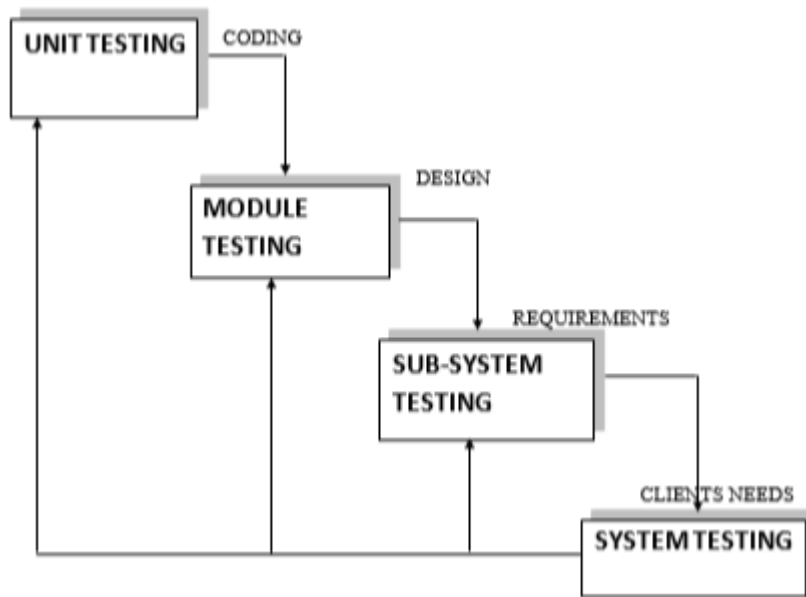


Fig 5.1 Testing Processes

5.3.1 Unit Testing

Unit testing is a process of identifying errors on the system by checking on a specific system section (Bently, 2011). This process is important since it is used to identify a problem or system failure to a specific module. Consequently, it identifies system errors at their premature stage because it is done before the modules are totally integrated to form a complete system. Unit testing can be carried out in two ways, namely black and white box testing.



Username _____

Password _____

New user? [Click here to register](#)

LOGIN

Fig 5.2 User Log in Page

5.3.1.1 Black Box Testing

Black box testing, it is a technique for system testing that looks at the convenience of a system without examining its interior configurations or mechanisms (Limaye, 2009). When using black box technique, the input processing is encapsulated from the rest of the world and only the output of the processed output is made known to the world which would be different from the inputs hence the term black box. The users will not have a know-how of what will be taking place in the system thus the black box gives a blind view to the world about the system contents although what happens in the black box can be viewed again as the output comes. The diagram below shows the testing of systems input and the results.

Borrowdale	0772345234
4	2
Cottage	Low density
154	22 borrowdale drive
Harare	Rent

it is a beauty property th

CALCULATE

The Property has been valued at \$1050

SUBMIT

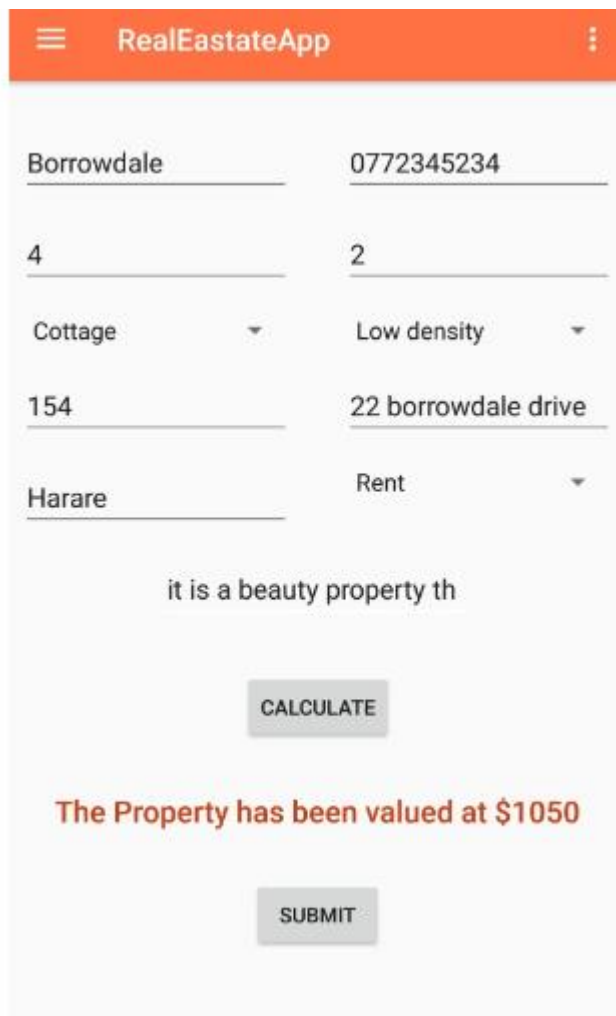
Fig 5.3 Valuation Of Property

5.3.1.2 White Box Testing.

White box testing is an examination of the system based on the structure of the code and the interior logic of the code also (Williams, 2006). It only examines the fundamental aspects of the system and has no or little relevance with the internal logical structure of the system (Nancy et al 2004). This involves thorough investigation of the internal structure and logic of the program. This was exercised by individuals who have the knowledge of the internal working of the programs and was done with the aim of identifying snippets of code which misbehaving.

5.3.2 Module Testing

This mode of testing makes use of some different system units inherent in a single module. These different units are combined together to test on the whole module's functionality. Turner and White (2012) defined module testing as a means of testing a complete code as it is produced by the compiler when built from the source. Jackson and Burd (2012) proposed that the objective of module testing is mainly to analyze if the individual units that are meant to collaborate to form a module are functional without errors. Thus module testing comes from the unit testing.



The image shows a mobile application interface for 'RealEstateApp'. The app has an orange header with a hamburger menu icon on the left and a vertical ellipsis icon on the right. Below the header, there are two columns of input fields. The first column contains: 'Borrowdale' (text input), '4' (text input), 'Cottage' (dropdown menu), '154' (text input), and 'Harare' (text input). The second column contains: '0772345234' (text input), '2' (text input), 'Low density' (dropdown menu), '22 borrowdale drive' (text input), and 'Rent' (dropdown menu). Below the input fields, there is a text label 'it is a beauty property th'. A 'CALCULATE' button is positioned below the text. Below the button, a message reads 'The Property has been valued at \$1050'. At the bottom, there is a 'SUBMIT' button.

5.3.5 TESTING STRATEGIES

The various testing strategies were implemented to ensure that the correct system functionality could be met. Errors such as syntax errors and database connection errors were noted and fixed. For example incorrect password could be accepted on the login forms which were not authentic.

5.3.5.1 Validation and Verification

Jawadekar (2004) indicates that validation is the art of checking the system performance, strengths and weaknesses as well as evaluating the objectives of the system. . This means that the final software package is checked to see if the intended goals are met. It can also be the comparison of data entered and the output. On this phase the system is checked if it is accepting valid inputs. For example text or numeric values should be used and in case of errors an error message should pop up (Brien, 1996).



Username !

Enter your username

Password

[New user? Click here to register](#)

LOGIN

Fig 5.4 User name field not completed



nashema

.....

New user? [Click here to register](#)

LOGIN

You entered an incorrect password/
username

Fig 5.5 Validation of user name and password

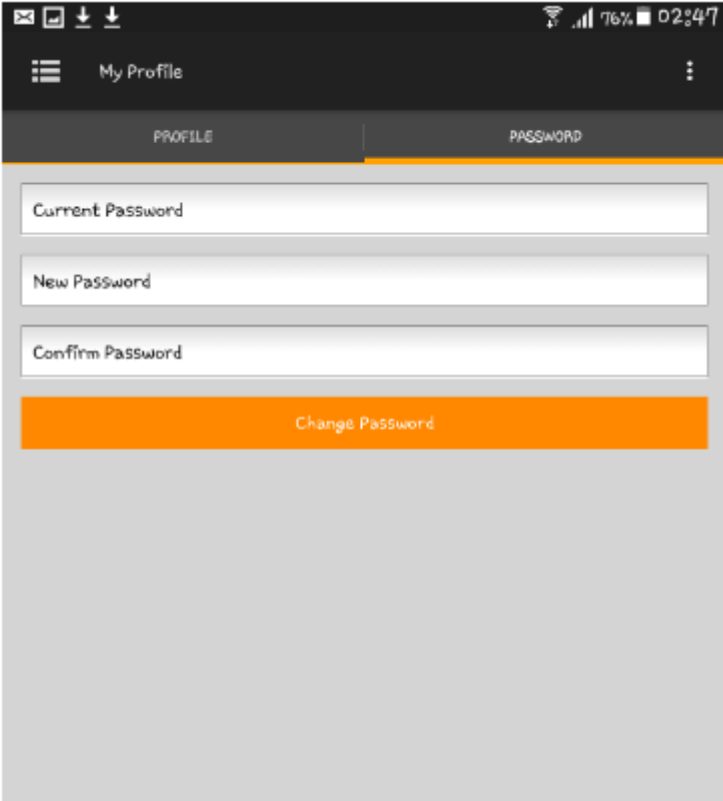


Fig 5.6 creation of new password

The image shows a mobile application interface for editing an account. At the top, there is a status bar with icons for mail, download, and battery, along with the time 02:47 and 76% battery. Below the status bar is a navigation bar with a back arrow and the text "Edit Account". The main content area is titled "gracaa" and contains several form fields:

- Email:** A text field containing "gracebeten505@gmail.com" with a pencil icon for editing.
- Owner:** A text field.
- Last Name:** A text field.
- First Name:** A text field.
- Phone:** A text field with a "+" sign, a "Code" dropdown, an "Area" dropdown, and a "-" sign.
- WhatsApp Phone Number:** A text field with a "+" sign, a "Code" dropdown, an "Area" dropdown, and a "-" sign.
- Select Country:** A dropdown menu.
- Any State/Region/Province:** A dropdown menu.
- Any City:** A dropdown menu.
- Address:** A text field.
- ZIP code:** A text field.

Fig 5.7 Creation of account

5.3.6.2 Verification

According to Dennis (1997) verification is a test of the user functionality on the system in comparison with the given objectives. This means that the developer confirm whether the running system has the correct functionality as intended by the end users. Rankl et al (2008) says that the verification stage requires the developer to confirm whether the system can meet certain operations as intended by the organisation.

10:33

RealEstateApp

Borrowdale	0772345234
4	2
Cottage	Low density
154	22 borrowdale drive
Harare	Rent

it is a beauty property th

CALCULATE

The Property has been valued at \$1050

SUBMIT

Fig 5.8 Valuation of Property

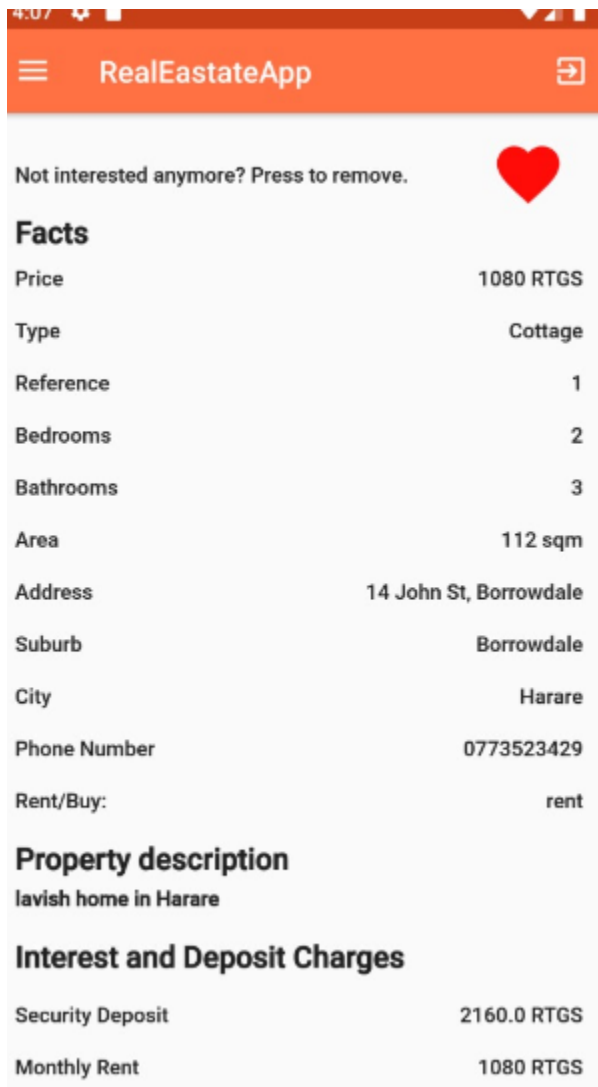










Fig 5.9 Calculation of interest and deposit charges when renting a house.

4:09     

 RealEstateApp 

Interested in the property? Like it. 

Facts

Price	83000 RTGS
Type	House
Reference	3
Bedrooms	3
Bathrooms	2
Area	153 sqm
Address	74 Napier Ave Hillside
Suburb	Hillside
City	Bulawayo
Phone Number	0773523429
Rent/Buy:	buy

Property description
byo city house

Interest and Deposit Charges

Security Deposit	0 RTGS
Mortgage 15yrs(@10%)	891.92 RTGS
Mortgage 25yrs(@10%)	754.22 RTGS
Mortgage 30yrs(@10%)	728.38 RTGS

Fig 5.10 Calculation of interest and Deposit when buying a house

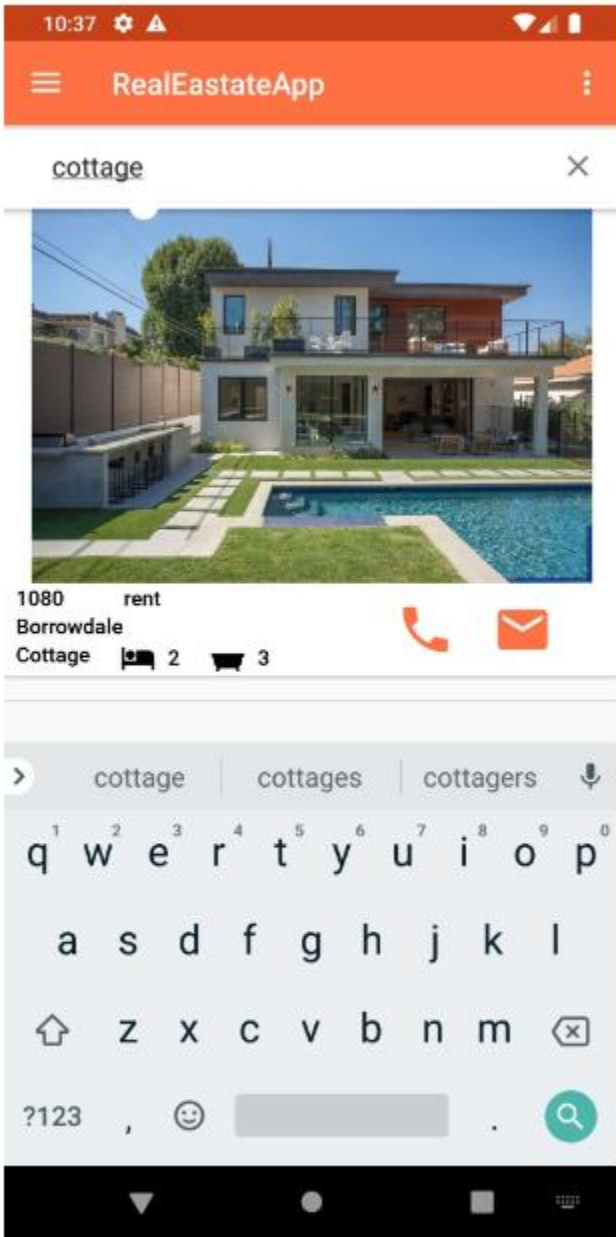


Fig 5.11 Searching Ouput.

5.4 Installation

Lee (2011) defines installation as the process of making hardware and/or software ready for use. Installation the process of moving from an old system to another system. This stage consists of system analysts making sure that the end user were fully trained and the decision concerning the changeover strategy to be used is fully examined. After the completion of tests it was deemed viable to implement the new system, the obsolete one had to be swapped with the fresh system and there were numerous changeover approaches which the experts had to examine and these approaches include pilot, parallel and direct change over.

5.4.1 User Training

User training is a process of teaching users on how to operate the system in order to make them aware of all functions and features of the new system to fuel effectiveness and efficiency (Pressman, 2005). According to Summerville (2007) training is defined as all the necessary methods that are meant to educate the users on how to use the new system appropriately and accurately. User training is most fundamental for any newly developed system or just when it is the users' first time to encounter with the system for familiarization purposes. On this system, they are basically three users who would be trained to use the system.

1) End Users (customers)

These are the users, in our case the property owners and property seekers who will directly download the application from Google Play Store or App Store. They would be presentation in the form of a slide show on how the users may navigate the system as they use it. Moreover, they will be taught on how to search and upload desired properties.

2) Real Estate Agents

These users will be trained to operate the system backend and how to capture the customer details and request that would have been made. Furthermore, they will be taught on how to generate reports meant for statistical analysis. Training on how to update information such as uploading new images.

3) System Administrator

This group of users will be in outright control of the new system. Their aim is to manage and maintain the system whilst in use and monitor the system users together with updating the front end part of the android application.

5.4.2 System Changeover

As indicated by Godfrey (2010) the way towards replacing the old system with the new system is alluded to as system changeover. Changeover can mean the transformation or a finish transform . System changeover is done essentially to dispose of or decrease issues that can emerge because of the move from old to new system. At the point when another system is being produced it doesn't imply that the old one is presently not usable. There may be a few ranges that will permit the joining of the old and new system. Changeover should be possible as parallel, direct, phased or pilot (Huassain, 2007).

5.4.2.1 Direct Changeover

According to Krugman (2009), direct changeover is completely ruling off the existing system replacing it with a new system. Kendall and Kendall (2011) defined direct changeover as a strategy that entails the complete overhaul of the old system and totally replacing it with the new one abruptly. This change over process is time saving and there are minimized cost but this is accompanied with elevated risk of losing all data since there will be no back up of the current system

5.4.2.2 Pilot Changeover

According to Hazra (2012) puts forward that this conversion strategy is a discriminatory implementation technique where the novel system is conveyed to those departments that require the use of the system. When the system proves to be working properly and all the links of the system are working out well, it will then be implemented throughout the organization. The major advantages of this strategy are that costs were relatively moderate because only one site runs both systems and also risks of the system failing

are likely to be minimum since the changeover is confined to the pilot site. However the drawback of pilot run which made it impossible to adopt was that it going to take a long time to achieve the complete change

5.4.2.3 Phased Changeover

Sommerville (2004), defines phased changeover as a process where one part of the system is introduced at a time up until the old system is totally removed. Users can adjust easily to the new system since there are no abrupt changes as the new system will be implemented in phases. The advantages of this strategy is that it facilitates clear understanding of the new system works and in cases when the system is found to be misbehaving, corrective measures will be done before the whole system corrupt the organization. However this type of changeover is time consuming and it is also expensive.

5.4.2.4 Parallel Conversion (Recommended)

Hutchens (2007), states that, parallel changeover is the process of running both the old system and the new system at one time parallel. This method has been deemed as the most effective method mainly because it runs two systems at the same time that is the old and new one simultaneously. Hence users got a solid chance to check for any problem that the system may have then tells whether the system was or not functioning as it was supposed to. However because two systems were running at the same time it became costly to operate them both but it had very low chances of failure as there was back up options.

- Purpose of using parallel conversion
- It allowed for ample time more to understand the new system
- risk of failure was very minimum
- feedback from users helped to know whether the system function as per to objectives before totally changing to the new system

5.5 Maintenance

As indicated by Sommerville (2004) system upkeep alludes to the acts of keeping the segments or system in legitimate condition. It can be taken as moves made to keep a device from falling flat or to repair the corruption of hardware in order to keep it in typical working request. Support is a constant practice that ought to be done consistently or at booked interim's (George, 2001). Maintenance monitors system performance, security and manages changes to meet the user specifications whilst a superb change procedures intrinsically ensures those desired changes made does not cause negative effects to the system. There are various types of maintenance strategies such as that of corrective maintenance, adaptive maintenance and perfective maintenance.

5.5.1 Corrective Maintenance

Corrective Maintenance is defined as any form of activity undertaken to detect, isolate and rectify fault so that the failed machine or system can be restored to its operable state (Sommerville 2004). These faults include program freezing, crashing of the system and these repairs maybe short term. Corrective maintenance can also be referred to as maintenance due to a breakdown or maintenance identified through a condition monitoring program. Corrective maintenance are done after a fault would have occurred and is done to repair unscheduled breakdown of an equipment or system.

5.5.2 Perfective Maintenance

Perfective upkeep includes the alteration and expansion of the current system programs in order to upgrade the execution of the system. This upkeep is done as a reaction to the extra client prerequisites which may come as a consequence of within and outside changes of the association (Krugman, 2009). The outside changes may incorporate ecological changes which if not dealt with might render the present system out of date or improper. Changes in data innovation can prompt these progressions thus perfective support will must be done as such as to adapt up to these progressions.

5.5.3 Adaptive Maintenance

Adaptive maintenance is the implementation of changes in a part of the system which has been affected by a change that occurred in some other part of the system. Adaptive maintenance consists of adapting software to changes in the environment such as hardware or operating system. The main reason for making the changes will be to constantly update the hardware and software platforms so as to meet the ever-changing user requirements and increase the best of quality to services offered. A system administrator is required to be readily available when this type of maintenance is in use since he/she will be tasked with checking the validity of the system in meeting its short and long-term goals.

5.5.4 Recommendations on maintenance

The system developing team recommended the use of adaptive maintenance since the system was established due to technological changes as well as collaboration among users therefore to stay ahead, adaptive maintenance is of greater paramount if implemented considering this dynamic changing environment.

5.6 Recommendations for future developments.

The future developers should focus on the following issues:

- The system should include the payment system whereby clients' will be allowed online payment.
- The system should incorporate others issues like application of stands and their approval.
- The software should be continuously upgraded to meet changing user requirements.
- For future utilize and referrals system created ought to be incorporated on the Trevor Dollar site to permit access by different specialists and consequently increasing the value of the organization

5.7 Conclusion

Trevor Dollar Real Estate Android Application successfully passed all the system development life cycle. The implementation phase shed light on the system testing. System testing was done through verification and validation. All the security issues were depicted that were supposed to be included in to the system supplemented with screen shots. System versus objective was also carried whereby the system was tested whether it has meet the specified objectives which proved to be successful. The developing team went on to discuss about the changeover strategies whereby they agreed on parallel changeover. Maintenance strategies were evaluated and adaptive maintenance was ideal for this system and this phase was concluded with the recommendations for further development.