

**DESIGN AND IMPLEMENTATION OF A COMPLAINT MANAGEMNT
SYSTEM**

BY

VERA OGHENEKARO EZIEMEFE

PSC1611555

DEPARTMENT OF COMPUTER SCIENCE

FACULTY OF PHYSICAL SCIENCE

UNIVERSITY OF BENIN

BENIN CITY

NIGERIA.

**DESIGN AND IMPLEMENTATION OF A COMPLAINT MANAGEMNT
SYSTEM**

BY

VERA OGHENEKARO EZIEMEFE

PSC1611555

**PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF
COMPUTER SCIENCE, FACULTY OF PHYSICAL SCIENCES,
UNIVERSITY OF BENIN, EDO STATE, NIGERIA. IN PARTIAL
FULFILMENT OF THE REQUIRMENT FOR THE AWARD OF
BACHELOR OF SCIENCE(B.Sc.) DEGREE IN COMPUTER SCIENCE.**

APRIL, 2023

CERTIFICATION

This is to certify that this research work was carried out by **VERA OGHENEKARO EZIEMEFE**, with matriculation number **PSC1611555** in the Department of Computer Sciences, University of Benin in partial fulfilment of the requirements for the award of Bachelor of Science degree in Computer Sciences.

Project Supervisor

Date

APPROVAL

This project is hereby approved by the department of computer science in partial fulfillment of the requirement for the award of Bachelor of Science Degree (B.Sc.) in Computer Science of the University of Benin, Benin City, Nigeria.

DR. CHETE
Project Supervisor

Date

PROF. (MRS.) A.O. EGWALI
Head of Department

Date

DEDICATION

This project is dedicated to God Almighty for His love and mercies throughout my study period. Also to my dear parent for their great support and to my beloved siblings, close friends and associates for your immense contributions during the course of this project work.

ACKNOWLEDGEMENTS

My profound gratitude to God Almighty for the knowledge, wisdom and understanding that he bestowed on me to carry out this project.

I appreciate my supervisor DR. CHETE for the supervision and support that she gave me, which helped in the progress and smoothness of this project.

My grateful thanks goes out to the entire computer science department of the University of Benin, the H.O.D Prof. Mrs. Egwali, and all the lecturers and all non-academic staff of the Department of Computer Science, University of Benin, Benin City, Edo State, Nigeria, who all prepared me for the base of Computer Science.

A very special thanks to all my friends and especially my family, this project would not have been possible without them who supported me morally and financially. May God Almighty continue to bless you.

TABLE OF CONTENT

Certification...	...	...	...	...	...	...	...	...	...	...	i
Approval...	...	...	...	...	...	...	...	...	...	...	ii
Dedication...	...	...	...	...	...	...	...	...	...	...	iii
Acknowledgement...	...	...	...	...	...	...	...	...	...	...	iv
Table of Content...	...	...	...	...	...	...	...	...	...	...	v
List of Figures...	...	...	...	...	...	...	...	...	...	...	vi
Abstract...	...	...	...	...	...	...	...	...	...	...	vii
Chapter 1: Introduction...	...	...	...	...	...	...	...	...	...	...	1
1.1	Background of Study...	...	...	...	...	...	...	...	...	...	1
1.2	Statement of the Problem	...	...	...	...	...	...	...	...	...	2
1.3	Aim and Objective	...	...	...	...	...	...	...	...	...	3
1.4	Significance of the Study	...	...	...	...	...	...	...	...	...	3
1.5	Scope of the Study	...	...	...	...	...	...	...	...	...	4
1.6	Limitation of the study	...	...	...	...	...	...	...	...	...	4
1.7	Definition of Terms...	...	...	...	...	...	...	...	...	...	5
Chapter 2: Literature Review...	...	...	...	...	...	...	...	...	...	...	6
2.1	Review of Concept	...	...	...	...	...	...	...	...	...	6
2.2	Complaint Management as a Strategic Tool	...	....	...	...	...	...	...	...	...	15
2.3	Manual Customer Complaint Management	...	....	...	...	...	...	...	...	...	23
2.4	Web-Based Customer Compliant Management System	...	...	...	...	...	...	...	...	...	24

2.5	Summary of Review	...	...	...	...	...	...	26
Chapter 3: System Design and Methodology		...	...	...	...	...	...	28
3.1	System Architecture	...	...	...	...	...	...	28
3.2	Software Design	...	...	...	...	...	...	30
3.3	Conceptual System Design	...	...	...	...	...	...	31
3.4	Subsystem Description	...	...	...	...	...	...	32
3.5	System Modeling Design	...	...	...	...	...	...	33
3.6	Use Case Diagrams	...	...	...	...	...	...	39
3.7	System Design	...	...	...	...	...	...	43
3.8	Data Flow Diagram	...	...	...	...	...	...	45
Chapter 4: System Implementation and Evaluation		...	...	...	...	...	...	48
4.1	Introduction	...	...	...	...	...	...	48
4.2	Program Language Justification	...	...	...	...	...	...	48
4.3	System Requirement	...	...	...	...	...	...	50
4.4	Implementation Details	...	...	...	...	...	...	51
4.5	Procedure Testing Plan	...	...	...	...	...	...	51
4.6	Result Evaluation	...	...	...	...	...	...	56
Chapter 5: Summary, Conclusion and Recommendation...		...	...	...	...	...	...	58
5.1	Summary...	...	...	...	...	...	...	58
5.2	Conclusion...	...	...	...	...	...	...	59
5.3	Recommendation...	...	...	...	...	...	...	59
References...		...	...	...	...	...	...	60

ABSTRACT

A complaint takes place when something goes wrong with no one willing to deal with the topic. If a customer fails to express oneself about something that went wrong, the firm stands to lose: an opportunity to improve has been missed. In order to retain existing customers, complaint management should be more than just a system of monitoring customer satisfaction: customers must be encouraged to bring out their concerns in form of complaints.

This study focuses on complaint management, creating an interfaced solution to unify communication between final year computer science students in order to improve data acquisition and utilization for decision-making.

CHAPTER ONE

INTRODUCTION

Establishments like Information Technology firms, schools, hospitals, government secretariats, financial institutions etc., which have large number of customers or clients receive enormous amount of complaints per day and these complaints have to be documented and filed for access and stored for future reference. A complaint system is a set of procedures used in organizations to address complaints and resolve disputes.

A complaint management system software is one of the latest productivity enhancement tools used widely by all organizations wherever there is a need of booking and analysis of complaints made or are pending.

1.1 Background of study

Academic growth can be of various concerns in an academic environment to promote social and functioning educational system. For an effective educational system to take place there are some issues in an academic environment that should be properly addressed, take for instance issue of complaints management system in the university. This issue had created a lot of problems for academic growth in the various aspects of the educational system. To support this approach, this project identifies a range of options that can be used to manage and resolve academic complaints. This includes, where the opportunity presents itself, the need for an administrator to make every effort to resolve potential or actual academic complaints as informally as possible in the first instance. Handling complaints often involve first, to listen and understand, empathize, offer a solution, execute the solution and then follow up.

Dogan and Wilkinson (2016) defined complaint as any expression of dissatisfaction about service(s) or about any professional conduct. It prompts more

prominent clarity and consistency of executive activities to determine the protests. Design and implementation of online complaint management system is to maintain an effective, timely, and equitable complaint handling system which is easily accessible and offered to complainants (students) at no charge.

This project defines the policy and steps for handling and resolving complaints and also to appeal for an un-favored situation and for this process to take place there must be automation of the system that will handle the complaints process and appeal method of registration.

A complain system is a software that uses modern day web tools to collect student's complaints and store it in the same way a human expert will save a complain about no light at the hostel . This software will be designed in such a way that it can listen to student's medical, emotional, psychological or educational problems.

A computerized complaint system can generally collect complaints, store them and these records are collected by the appropriate authority and then decide on the next step to be taken in solving the issues.

1.2 STATEMENT OF PROBLEM

During the analysis and data collection of this project, it was discovered that there existed a manual form of collecting and storing of student complains in other for them to be attended to and for future purpose by the Class Rep of the final year students of computer science department and the Students Affairs Department of the University.

That is to say, the process of daily task and activities are done manually; manual procedure for complains execution delays and reduces the result output quality.

Manual complain record keeping has resulted in many problems which include:

- I. Time wastage and long queries

- II. Partial or total loss of files or documents.
- III. Incomprehensive complaints history.
- IV. Lack of prompt updating as to when a complaint issues has been resolved.
- V. Exposures of confidential matters.

As a result of these problems, the manual system of complains record information storage, input and retrieval is very clumsy and inefficient.

1.3 AIM AND OBJECTIVES OF THE STUDY

This project is aimed at implementing a complaint management system which will be having the following objectives:

- I. Receive daily complain from students.
- II. To provide quick response to student's complains on campus.
- III. Allow students to register and obtain username and password to login into the system and lodge in their complain and view previous complains.
- IV. To provide a medium through which authorize personnel can attend to those complains from the students from any location.
- V. Simultaneously update changes made to any data, item in the entire database.

1.4 SIGNIFICANCE OF STUDY

- I. To serve better than the existing system. The existing system is manual and as a result, there is this difficulty in terms of monitoring the complaints in the University, improving database and enhancing effectiveness, efficiency, and security of the system.
- II. Students can register with the system and get username and password that can enable them login at any time and present their complain(s).
- III. It is also intended that the study will help in the development of a new and better computer-aided complaint system.

- IV. The new system will save time, reduce improper handling of complaint system and also improve the relationship between students, lecturers and management.
- V. The system is expected to be easy as a student can log in their complaint anytime, staff and management also can equally respond to student's complaint in more easy ways.

1.5 SCOPE OF THE STUDY

To design a system that will enable students login their complaints and request for management help concerning any issue.

1.6 LIMITATION OF STUDY

- I. Due to the scope of this project work as mentioned above, this project work is limited to complaint management system. This application cannot process the penalties for anybody found being grieved or the punishment for any staff or student found being at fault of any complaints.
- II. It does not provide the means of live communication between the complaint and the responder.
- III. Time constrain: There was no time as such, as this study was done side by side my work and business activities thereby cutting down on the time devoted to this study.
- IV. Financial constrain: Insufficient fund limited the access to several materials and resources that would have been used in the course of this study.

1.7 DEFINITION OF TERMS

1. **Complaint:** The act of expressing discontent or unhappiness about a situation.
2. **Appeal:** Request by a complainant to have a matter heard and/or reconsidered after receiving an unfavorable decision.
3. **DATABASE:** An organized collection of data that is stored in computer and can be accessed and used in various ways.
4. **RELATIONAL DATABASE MANAGEMENT SYSTEM:** It uses relation or two dimensional tables to store information.
5. **MYSQL:** It is English like database query language used for retrieving and managing data in a relational database management system, it is a query language for querying and modifying data and managing databases.
6. **PHP:** Originally stood for personal homepage but currently it is known as hypertext preprocessor. It is widely used as a general purpose server-side scripting language that was originally designed for developing dynamic web pages.
7. **HTML:** (Hypertext markup language) is the set of markup symbols or codes inserted in a file intended for display on a World Wide Web browser page.
8. **CASCADING STYLE SHEETS:** (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

A complaint system is a set of procedures used in organizations to address complaints and resolve disputes. Complaint systems in the US have undergone several innovations especially since about 1970 with the advent of extensive workplace regulation. Notably in many countries, conflict management channels and systems have evolved from a major focus on labor-management relations to a much wider purview that includes unionized workers and also managers, non-union employees, professional staff, students, trainees, vendors, donors, customers, etc.

There is also a major need to collect, review and understand the nature of conflict management and complaint systems around the world. Studies and citations are needed about how complaint systems work for women as well as men. Research is needed as to how systems work for many different national groups, for people of different socio-economic classes, and different ages, and different religions, and especially for contract workers and immigrant workers, in every country. Studies (and citations) are needed about complaint systems in health care, in faith-based organizations, in schools, in political organizations, in the military and in many specialized occupations.

2.1 REVIEW OF CONCEPT

2.1.1 Complaint Management

“Everyone in business hates complaints” (Stauss & Seidel 2004: 1). It is easy enough to drive customers away. The quotation above presents the predominant attitude towards complaints: they take place when something goes wrong, with no one willing to deal with the topic. If a customer fails to express oneself about something that went wrong, the firm stands to lose: an opportunity for the firm to improve has been missed. But if a customer does complain, it should be considered half victory: customers that are lost are usually the ones that do not even bother to complain (de Matos, Rossi, Veiga & Vieira 2009: 471). In order to retain existing customers, monitoring customer satisfaction is merely not enough (de Matos et al. 2009: 462).

Instead, customers should be encouraged to complain: the lifetime value of a loyal customer is too valuable to be ignored. Taken on an efficient level, complaint management makes for happy and loyal customers, who actually account for an unusually high proportion of sales and profit growth (Heskett, Jones, Loveman, Sasser Jr. & Schlesinger 2004). (Huppertz 2007.)

It is important both to delight and to avoid disappointing the customers. Long-term strategies are taking place to both retain and expand the current customer base (Hansen 1997). Stauss & Seidel (2004) mentioned customer-oriented corporate policy as a critical success factor, but complaint management should be more than just a basis for corrective actions. Complaint management provides businesses a cost-effective channel to collect valuable information about customer expectations and needs through problems that customers experience (Barlow & Møller 1996; Stauss & Seidel 2004). In support of complaint management, a systematic process

for obtaining this information from the customers is of great value (Fundin & Bergman 2003: 55).

Jones & Sasser Jr. (1996: 57) mention five different ways for gleaning information regarding customer satisfaction and preferences: satisfaction surveys, feedback, market research, customer service, strategic measures. This research is based on the second alternative (feedback) in pursuance of customer service and strategic measures. Same applies to a tertiary institution of learning, for example, a university that has a large environment of students, an efficient complaint management system that is able to collect valuable information about student's expectations and needs through problems that the students experience and the system is able to relay feedback to the students on complaints made and the system is also able to keep track of satisfaction surveys, these will in turn make the institution of learning great.

2.1.2 INTRODUCTION TO COMPLAINT MANAGEMENT

Complaints can arise from a variety of situations such as delivery, product, or service problems. Ineffective complaint management is one of the major flaws among firms, organizations or institution of learning.

According to Stauss & Seidel (2004: 34), complaints contain specific indications of organizational weaknesses. Teng, Ho & Shumar (2005: 140) note that disagreements and conflicts (on warranty problems) are due to inaccurate classification and insufficient information, which is also true on complaint related issues. Whether an organization is complaint friendly or not will be determined via complaint handling practices and customer willingness to complain (Barlow & Møller 1996: 138). By adjusting the complaint handling policies and processes,

firms' signal whether it is easy to complain and is success likely or not: customer's willingness to complain depends on the probability of a positive outcome (Huppertz 2007). Effective complaint management should always result in customer satisfaction, catering also operational and financial improvements (Johnston 2000; Stauss & Seidel 2004). To reach the target, several aspects (e.g. employee satisfaction, customer satisfaction) must be taken into account.

To date, complaint management has not been broadly discussed in the terms of scientific research. Most research has been focusing on complaint behaviour and carried out from the non-western, business-to-consumer point of view (Liu & McClure 2001).

According to a study by Stauss & Schoeler (2004), most companies do not actually calculate the benefits of complaint management or measure complaint management profitability at all. Added to this, Barlow & Møller (1996) argue that most companies, organizations or institutions of learning like a university do not even have a complaint policy.

2.1.3 DEFINITIONS

Complaints witness the fact that customers have not been satisfied and contain concrete evidence of existing problems. The complaining process usually starts when someone is told about a problem and asked to solve the cause of the complaint (Hansen, Swan & Powers 1996). The term "complaint" may be defined in several different ways. Barlow & Møller (1996: 11, 20) consider complaints as a statement of customer expectations that have not been met. Stauss & Seidel (2004) remind that complaints, as intentional expressions of customer dissatisfaction, offer firms an opportunity for improvement, and define complaints as follows:

Complaints are articulations of dissatisfaction that are expressed toward firms and/or third-party institutions with the aim of making a provider aware of a behaviour that is subjectively experienced as harmful, receiving compensation for adverse effects suffered, and making a change in the criticized behaviour (Stauss & Seidel 2004: 16–17).

From the case organization's point of view, complaints (i.e. reclamations) may be seen as the operative handling of a situation in case of, for example, transportation damage or quantity mismatch or poor lecture or service delivery in the case of an institution of learning, like a university. Complaints offer organizations an opportunity to retain its reputation and customer base by correcting the problem (e.g. Barlow & Møller 1996; Hansen et al. 1996; Stauss & Seidel 2004). In addition, complaints provide organizations valuable information regarding customer preferences and, best case scenario, future expectations (e.g. Barlow & Møller 1996; Martín-Castilla & Rodríguez- Ruiz 2006; Vareila-Neira et al. 2010). Well utilized, this information may be used to improve the quality of products and services offered making complaints even desirable for the organization (Hansen et al. 1996).

Fornell & Wernerfelt (1988: 289) make a clear difference between warranties/guarantees and complaint management that they consider a “more general undertaking”. Contrary to warranties/guarantees that represent a limited provision, complaint management provides consumers different levels of compensation on both services and products. Added to this, complaint management leads up to facilitate voicing of complaints with an interaction with quality and continuous improvement. (Fornell & Wernerfelt 1988.)

2.1.4 COMPLAINT MANAGEMENT OBJECTIVES

“One of the common mistakes what comes to complaint management is that firms refer to low rates of complaints and high level of satisfaction that is reflected in the corresponding results from customer surveys” (Stauss & Seidel 2004: 2).

Complaint management is not about minimizing the number of complaints, but to get the most out of the feedback submitted by the customer; information that may be utilized in both active and proactive decision making in terms of current and future customers (cf. Fundin & Bergman 2003). Stauss & Seidel (2004) emphasize complaint management as the core of a customer-oriented corporate strategy, in which the organization has to take the first step, as well-described by Fornell & Wernerfelt (1988: 296): “Unless the firm encourages complaints and is well equipped to deal with them, it seems reasonable to assume that the segment of customers who complain and remain loyal would be quite low”. Added to this, Bosch & Enríquez (2005: 30) highlight the importance of “capturing, analyzing, and translating customer complaints into adequate actions for focuses improvement”, which is required to maintain competitiveness within service economy.

From the problem solving point of view, Gruber et al. (2010) emphasize the importance of straightforward action to clearly and quickly analyse and address the problem causing the complaint. Complaint management involves monitoring and controlling the whole value chain throughout the process reaching out from the customer to the supplier. In addition, complaint management supports controlling different flows of information; viewing, sharing, and documenting. In optimal case, complaints should evoke companies to pay attention to their own processes and

therefore lead to the identification of problems and their corrective actions (Johnston 2010: 63).

As seen on Figure 2.1, core operation tasks of complaint management have points of resemblance to the Deming Cycle. They involve designing and planning the system jointly by controlling and executing the plans of improvement. Like for every process, complaint management performance needs to be monitored and evaluated regularly in order to achieve the level of sustainability.



Figure 2.1 Core-Operation Tasks of Complaint Management (Johnston 2000).

2.1.5 Direct and Indirect Complaint Management

Stauss & Seidel (2004: 32) split complaint management into direct and indirect complaint management based on customer involvement: In direct complaint management, all tasks relate directly to an individual case and actions related to solve the case. Indirect complaint management, for one, includes all tasks in which the customer is not directly involved. As seen on Figure 2.2, Customer Relationship Management (CRM) has a strategic impact on complaint management. Both employees and organization resources are required in order to effectively perform direct and indirect complaint handling tasks. (Stauss & Seidel 2004.)

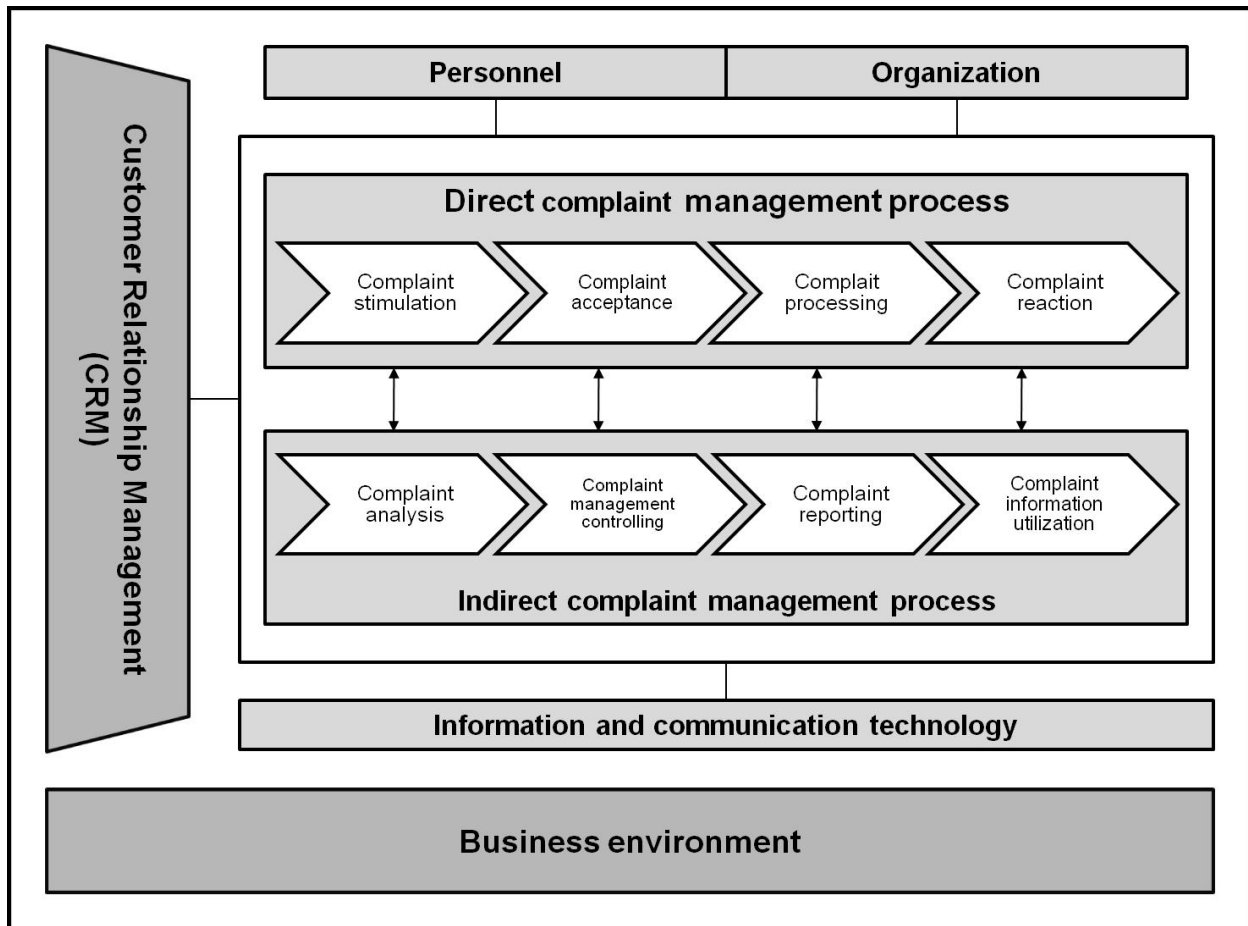


Figure 2.2. Tasks and Business Environment of Complaint Management (Stauss & Seidel 2004: 35).

As seen on Figure 2.2, the group tasks of direct complaint management are split into four (Stauss & Seidel 2004: 32): complaint stimulation, complaint acceptance, complaint processing, and complaint reaction. Complaint stimulation concentrates on assuring customers a well-designed channel to voice their complaints. Complaint acceptance pays attention to the complaint input and documentation, which is the key factor of utilizing complaint information by systematic analysis. Complaint processing is about the systematic design of complaint settlement. This means identifying and modelling the actual handling process and defining the categories along with responsibilities related to each task. Once every processing

step with its contents is chronologically documented, utilizing complaint data becomes more convenient. Complaint reaction defines the fundamental guidelines according to which the firm reacts to customer complaints. (Stauss & Seidel 2004.) Within these steps, effort shall be put into the active processing of incoming complaints.

Therefore, employee empowerment and accessibility must be taken into a level where performing necessary actions is possible. Contents of the document, categorization of those contents, and the form of the documentation are given high priority. In case of written complaints (i.e. case company), intermediate replies and final answers represent the firm and therefore have great influence on the “moment of truth” – first and the most important expression that defines how the service process is composed of towards the customer (Grönroos 1988). Hence, responsibilities related must be clearly defined in order for the company to react instantly. (Stauss & Seidel 2004.)

Once the phase of “reaction” is over, the process continues to indirect complaint management, which is invisible to the customer: indirect complaint management includes all tasks in which the customer is not directly involved. Complaint analysis involves both qualitative and quantitative analysis that is essential for creating a pattern for different types of complaints. Quantitative analysis is mostly based on complaint volumes, lead-times, and prioritization. Qualitative analysis concentrates more on the solving process prospecting for possible targets of improvement. The role of complaint management controlling is to assure the level of quality by monitoring and evaluating the complaint management process and to estimate the cost-benefit effects of the complaint management function. The main objective of complaint reporting is to assure that the complaint information is

accessible throughout the organization to the various internal target groups. The focus of key performance indicators used depends on the strategic focus of the organization. The main objective of complaint management is to provide substantial contribution to the organization's quality system. In order to take full advantage of the measures of improvement offered, systematic complaint information utilization must take place. Naturally, effective utilization requires for all the other phases to support this function. (Stauss & Seidel 2004.)

2.2 COMPLAINT MANAGEMENT AS A STRATEGIC TOOL

2.2.1 CUSTOMER SATISFACTION

“Trust and loyalty can, however, be neither forced nor bought; they must be won based on positive experiences” (Stauss & Seidel 2004: 3). In context of customer satisfaction and lifetime value, customer focus has become top priority. Customer loyalty drives profitability and growth (Heskett et al. 1994: 165), which have an important role in improving business operations. The level of customer satisfaction is not adequate indicator to base strategic decisions on. In addition to customer satisfaction surveys, organizations should look for alternative ways to communicate with current, former, and future customers. Long-term strategies are taking place to both retain loyal customers and expand the existing customer base to new customers. With continuous growth important, customer satisfaction is essential for enhancing the long-term relationships. (Hansen 1997.)

According to Stauss & Seidel (2004: 3, 10), complaint management can be seen as the heart of customer relationship management (CRM), which they define as the “totality of corporate measures for the systematic initiation, development,

maintenance of customer relationships”. CRM is also to include customer relationship termination and reinitiation, in which complaint management belongs to. Jones & Sasser Jr. (1996) list three most typical conceptions of customer satisfaction: First, highly satisfied customers may be left unheeded. Second, because of low yield on investing in customer satisfaction, it is not worth the investment. Third, customers with high satisfaction do not justify the organization to focus solely on dissatisfied customers. In context of correlation between customer satisfaction and customer loyalty, these hypotheses stand inadequate. (Jones & Sasser Jr. 1996.)

A positive correlation exists between the significance of customer satisfaction and the level of competition (Jones & Sasser Jr. 1996: 55). In other words, competition generates the customer a freedom of choice by providing substitutive goods, from which to choose from. Barlow & Møller (1996) explain complaint management through a psychological principle called reciprocity, which may be clarified by the saying; “favour for a favour”. In order to stand out, Jones & Sasser Jr. (1996: 55) emphasize the concept of added value (cf. Womack et al. 1990; Womack & Jones 1996; 2005).

According to Jones & Sasser Jr. (1996: 56) customer satisfaction comprises four elements that are linked together: basic feature of goods, ordinary support services, service recovery, and additional services. On a global level, the interest has lately been clearly focused on additional services rather than to basic goods. Consumption decisions are made based on availability of different services to extend the user experience beyond the initial offering, in which scale advantages play a key factor. Similarly, scale advantages and power are an important variable of organizational relationships. Hansen et al. (1997) bring out the concept of perception of power, which is usually in larger party’s (= more influential) favour. This may be seen in

practice, when the biggest vendors may dictate workings, as smaller vendors acquiesce in the proposed arrangement. However according to Hansen (1997), the use of power in buyer/seller relationships has shown to foster merely negative results.

2.2.2 COMPLAINT BEHAVIOUR

A low volume of complaints does not indicate customer satisfaction (Stauss & Seidel 2004). Customers that restrain themselves from complaining may conclude that it is not worth the effort of going through the whole process of voicing a complaint (Huppertz 2007: 428) and is therefore dependent on the expectation of the effort (time and/or money) involved (Owens & Hausknecht 1999: 35). Instead, switching supplier because of dissatisfaction caused may feel attractive in context of cost-benefit trade-offs. If interdependence would exist, a service recovery would be favorable to both sides of the contract: concluding collaboration signals a lack of dependency. In addition to switching suppliers, unsatisfied customers may also result in negative word-of-mouth driving potential customers away (Huppertz 2007).

Complaint behaviour – from the viewpoint of both the complainer and the party responsible for handling the complaint – has a great impact on the final result. The research by de Matos et al. (2009) showed that variables such as gender, age, and education do not influence customers' attitude towards complaining: complaint behaviour is conditional on personality and attitude towards complaining. Owens & Hausknecht (1999: 36) note that the outcomes of the complaint process are determined by response the consumer receives from the organization's complaint handler. While companies have little or no control over consumer complaint

behaviour, cost-benefit assessment of pre-complaint consumers is possible (Huppertz 2007: 429). The least a firm can do is to encourage customers to sound their concerns through complaining.

Jones & Sasser Jr. (1996: 54) point out that on a scale from 1 to 5, customer satisfaction is already perceived brilliant at 4 and improving it to 5 is seen as gratuitous work. In other words, the service level below the highest grade is perceived sufficient. However the expected lifetime value of loyal customers tells a different story making effort on each level of satisfaction worth the effort. Influencing the way employees handle customer complaints can increase customer satisfaction. By the same token, Huppertz's (2007) research showed that firms could influence customers' complaint behaviour by altering their own complaint handling processes. This involves adjusting different factors (e.g. willingness to be of service) that have an impact on customer satisfaction and the process of voicing a complaint. The research by Owens & Hausknecht (1999) showed that by improving the complaint handling process that was perceived much of a burden on the consumer, the return rate raised from 22 per cent to 48 per cent (that actually indicates an increase of 118 per cent in terms of receiving information on customer preferences)! Well-utilized, this information may lead to maximized customer satisfaction as the ultimate commitment pursuing for securing customer loyalty and improving financial performance (Jones & Sasser Jr. 1996: 55).

2.2.3 SERVICE RECOVERY

Complaining customers are among the most loyal customer in the market (Barlow & Møller 1996). And even if they were not, they might become one if the company's complaint handling process surpasses their expectations. In order to

succeed, organizations must be aware how customers react to service failures (de Matos et al. 2009: 462). In case of a complaint, an effective service recovery – the process of making right what went wrong – is critical in order to restore customer satisfaction back to the level where it (Barlow & Møller 1996: 73). In order for a service recovery to take place, the company needs to be aware a problem occurred. In other words, companies may not be aware of prevailing problems unless customers complain about them. This means that customers, who switch or just disappear, prevent the company from fixing their problem.

The conceptual model of de Matos et al. (2009) examines the main variables of a service recovery. These include failure, recovery, and perceived justice, from which failure may be measured through magnitude and recovery through responsiveness. Their study showed that customers with higher attitude towards complaining were more likely to complain regardless of their level of satisfaction. The presumable complainers also showed a stronger alteration on satisfaction via service recovery. A mutually fair complaint process and a convincing service recovery will increase the possibility of positive word-of-mouth enticing new customers. As a result, the importance of these variables was seen to have a positive correlation with those more likely to complain. (de Matos et al. 2009.)

In context, Hirschman (1970: 4, 19) represent that organizations have two alternative routes to find out about their failings: exit and voice – market (economics) and nonmarket (politics) forces. The exit option is as earlier described: customers leave without a sound resulting in revenue drop and leaving the management to figure out the question of what went wrong. In the voice option,

customers express their dissatisfaction and thereby open up a possibility of service recovery; the organization to solve and fix the problem. (Hirschman 1970.) The success of a service recovery is dependent both on the frontline employees and the systematic complaint solving process beneath: a service-oriented frontline employee will not do much good if the actual solving process is ineffective – and vice versa. However, Johnston (2000) notes that the cause of customer dissatisfaction is not necessarily the failure itself but the organisation’s response to a failure. Handled the right way service recovery may even raise customer satisfaction beyond expectations.

Employees may be trained to sense and respond with a style suitable for each customer (Hansen et al. 1996; 1997). Homburg & Fürst (2005: 108) note that even satisfaction that has cumulated over time will not matter if a service recovery fails: “ineffective service recovery and an ineffective complaint policy can start a negative chain reaction leading to poorer quality service and products, as well as increased risk in the marketplace” (Barlow & Møller 1996: 33).

2.2.4 COMPLAINT MANAGEMENT PROFITABILITY

A complainer presumes that the cost of complaining does not exceed the benefits of complaining (Hansen 1997; Hansen et al. 1996; 1997). In addition to improving customer satisfaction, efficient complaint management should minimize potential damage caused by complaints. Just like quality, complaint management success can be measured against customer expectations: complaint management may be considered successful as customer expectations exceed. In addition, complaint management should focus on products of high profit and of high quality (Fornell & Wernerfelt 1988: 288) just like organizations tend to prioritize their most important

customers. Regardless, complaint management costs and especially benefits may be hard to define, as worst implications remain only hypothetical. Best-case scenario, complaint management rewards both the company and the customer with additional value: while the customer receives a higher level of service, the company receives valuable feedback as return. (Vareila-Neira et al. 2010.) According to Barlow & Møller (1996: 22), direct complaints that customers channel to businesses are the most cost-effective way to receive information about customer expectations. Other options include, for example, benchmarking and external auditors. de Matos et al. (2009: 471) suggest segmenting the customers according to their complaint behaviour in order to maximize the outcome. Effective complaint management may be used to reduce both external and internal failure costs. Systematic analysis of the complaint information may help the firm to point out internal flaws. In addition, complaint information may be for external cost savings by adjusting complaint handling processes according to the complaint statistics. (Stauss & Seidel 2004.)

Stauss & Schoeler (2004) highlight the importance of systematic consideration by developing methods to gather the required cost information in order to determine all relevant cost elements. Even though complaints do provide “cost-free” channel for customers to bring out their concern, both direct and indirect costs are involved (Bosch & Enríquez 2005: 31). It may not always be possible to reduce the direct cost of complaint handling but indirect cost reductions are possible through improvements that prevent future failures, originally brought up by the customer (Johnston 2000: 63). By proper handling of complaints, customer dissatisfaction may actually be transformed into satisfaction (Bitner, Booms & Tetreault 1990). Fornell & Wernerfelt (1988: 288) analysed complaint management rather as a

defensive tool, which both satisfied current customers and restrains them from switching suppliers. Johnston (2000) finds a significant, positive correlation between efficient complaint management and financial performance that may be exploited through service recovery. He also emphasizes the importance of improving operational business processes and satisfying firms own employees in order to reach these goals. Complaint costs are mostly generated during the processing of complaints and by streamlining the process, costs will be cut (Stauss & Seidel 2004). Naturally, cost must be examined in relation to the benefits that can be achieved. Still, it seems that beneficial complaint management is still quite rare among most organizations. Despite the cost, complaints do provide priceless information as a trade-in.

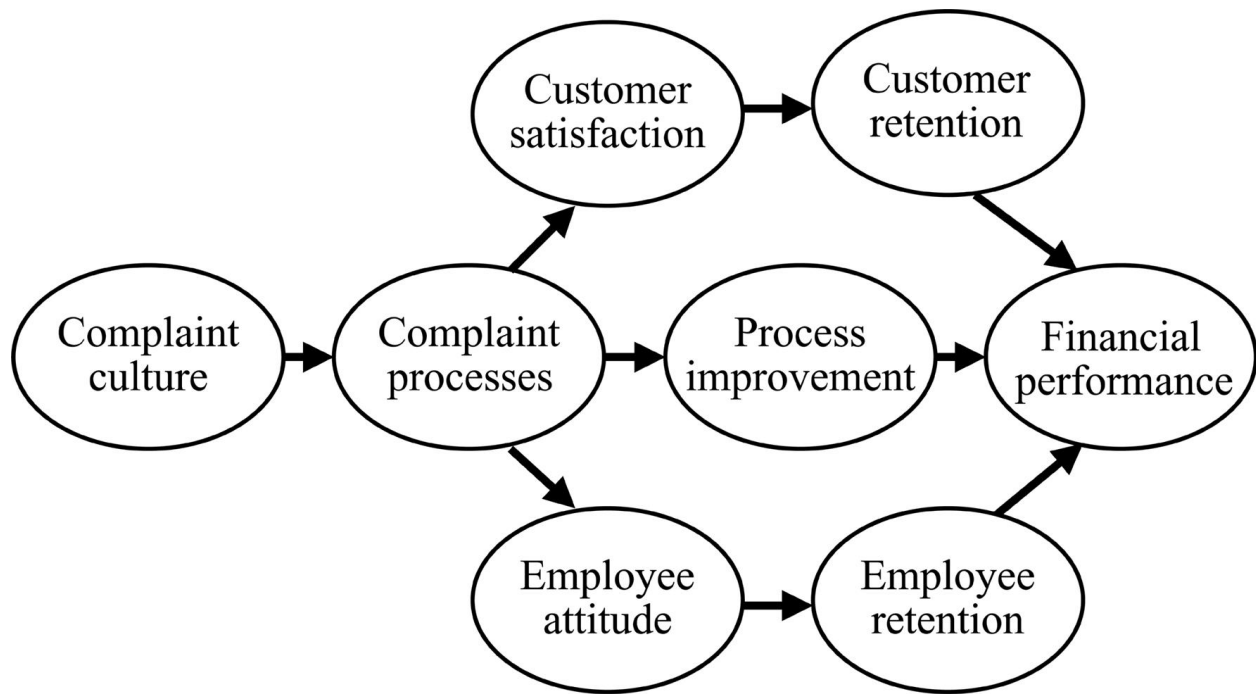


Figure 2.3. The Conceptual Model of Complaint Management (Johnston 2000: 62).

The above figure (Figure 2.3; Johnston 2000) illustrates the components of complaint management. Together with a systematic complaint process, both customer and employee satisfaction are required for complaint management to reach the sustainability towards financial performance. Stauss & Seidel (2004: 30) state that profitability and competitiveness are the key factors of complaint management. In order to increase these factors, the global aim of complaint management should be reviewed from three different viewpoints (Stauss & Seidel 2004: 30): 1. Restoring customer satisfaction; 2. Minimizing the negative effects of customer dissatisfaction; 3. Using the indications of operational weaknesses and of market opportunities that are contained in complaints.

2.3 MANUAL CUSTOMER COMPLAINT MANAGEMENT SYSTEM

In most of the manual methods of customer complaint management, the customer, client, student as the case may be has to interface with a member of staff of the organization or institution to tender his or her complaint(s) which is usually done in a written form and then submitted. At times the complaint(s) are done verbally through any means of communication. In few occasions feedbacks are given to the client but in many occasions, the client may never get feedback for his or her complaint for one reason or the other. There are many drawbacks associated with the manual system of managing customer complaints, these include: Time wastage and long queries, partial or total loss of files or documents, incomprehensive complaints history, lack of prompt updating as to when a complaint issues has been resolved, exposures of confidential matters, inefficiency of some members of staff due to laziness in searching for files. Though there are still many organizations out there that still use the manual method of customer complaint management, apart from the few advantages of interfacing with the customer and the ability to air

one's complaint on a one to one basis, the drawbacks are numerous when compared to the web-based customer complaint management system.

2.4 WEB-BASED CUSTOMER COMPLAINT MANAGEMENT SYSTEM

Online Complaint Management System provides an online way of solving the problems faced by the public by saving time and eradicating corruption. The objective of the complaints management system is to make complaints easier to coordinate, monitor, track and resolve, and to provide company with an effective tool to identify and target problem areas, monitor complaints handling performance and make business improvements.

Online Complaint Management is a management technique for assessing, analyzing and responding to customer complaints. Complaints management software is used to record, resolve and respond to customer complaints, requests, as well as facilitate any other feedback. Advocacy Research, (2021) opined that it is important that complaints are registered before they can be managed. When you have a complaint, it is important to get the details, and to provide evidence when you can and according to Kolsky (2015), 13% of unhappy complainants will share their complaints with 15 or more people. Furthermore, only 1 in 25 unhappy complainants complain directly to the administrative head. According to this statistics by Kolsky, most complainants tend to either keep dissatisfied issues bottled down, or discuss the issues with other people who might become discouraged. Complaint registration not only gives you the power to lay criticisms, it also gives room for rapid feedback.

According to Surbhi (2018), Management can be defined as the process of administering and controlling the affairs of the organization, irrespective of its nature, type, structure and size. It is an act of creating and maintaining such an environment wherein the members of the organization can work together, and achieve business objectives efficiently and effectively. By defining the words, we can say that Complaint Management is the process of controlling the issues of dissatisfaction or unhappiness expressed by complainants. Complaint management enables an efficient handling and controlling of issues laid by complainants. Management acts as a guide to a group of people working in the organization and coordinating their efforts, towards the attainment of the common objective (Surbhi, 2018).

It is very difficult to know what a person is thinking. It could be that majority of people are satisfied with your services, yet some of them have problems with it. This is why it is important to establish a functioning complaint management system, one that ensures good rapport with the people. In complaint management, strategies must be developed and it must be determined where complaints should be received, how one should react to feedback and which departments or individuals the criticism should be forwarded to (IONOS, 2019). Bosch & Enríquez (2005) summed the significance of complaint management systems felicitously:

“A successfully implemented complaint management system can change the perspective of complaint management and transform the process of answering complaints from a trivial activity to a more exciting process-design and learning

experience, renovating the spirit of continuous improvement towards service excellence.” Bosch & Enríquez (2005: 30)

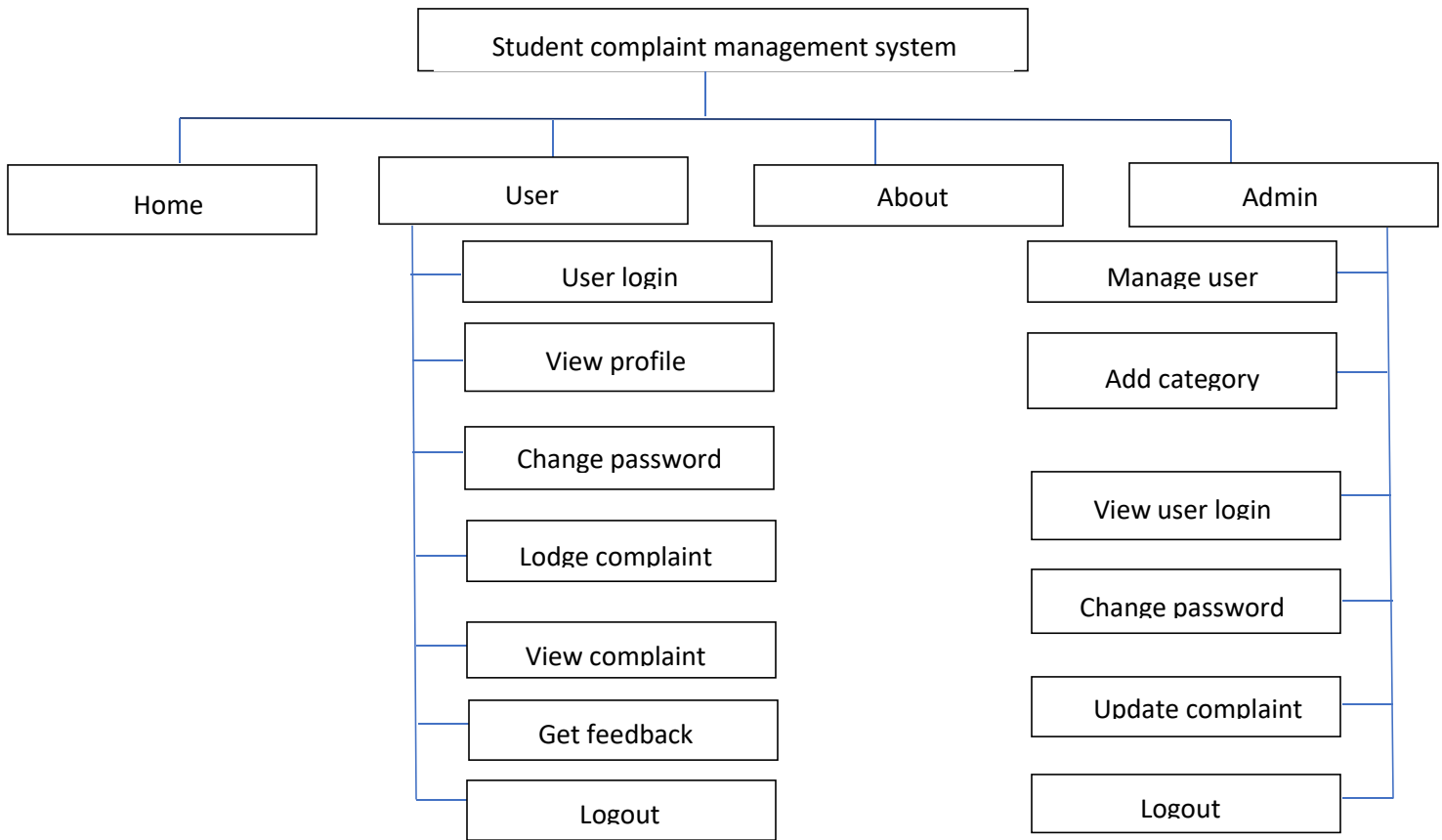


Figure 2.4

High level model of the proposed system

2.5 SUMMARY OF REVIEW

The researcher has reviewed how the system works. This research presents an overview of the development and implementation of the Complaint Management System as a web-service based. The results obtained from the implementation are encouraging and promising for the development of more complex systems in the future as the Complaints Management is a complex and critical problem.

Complaints and compliments are valuable source of information that organizations can use to improve program delivery and service. As regulatory and market pressures continue to mount upon companies, industry leaders will need to develop effective solutions or face the high costs inherent in failed technology implementations and weak customer relationships. The preferred alternative is a customer-focused complaints management solution that works. Finally the researcher believes that the presented model can be helpful in other fields of e-complaining in terms of Citizen Adaption and Citizen Loyalty.

CHAPTER THREE

DESIGN AND METHODOLOGY

3.1 SYSTEM ARCHITECTURE

3.1.1 UPPER-LEVEL ARCHITECTURE

The designed system is built on the basis of 3-tier client-server architecture. The database server is built using SQL and is resident locally in the system's local disk; the client side inputs are received from a mobile device and the interaction between the client and the server side is achieved using PHP. All the data is stored using MySQL database which is a relational database. And finally the application is hosted online.

The architecture is as shown in figure 1.

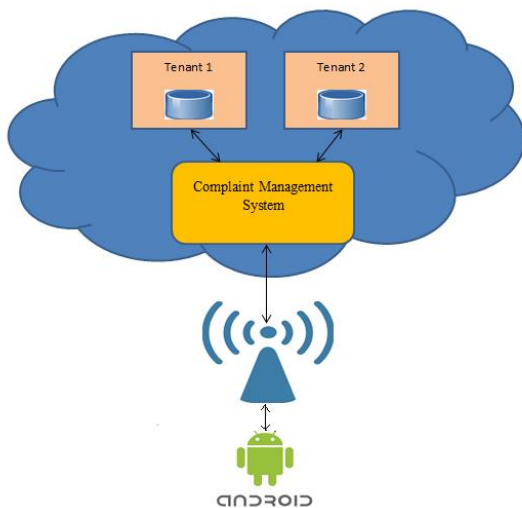


Figure 1: Upper level System architecture

3.1.2 Subsystems

Client Tier – User interacts with the system using a mobile interface. The user interface provides a platform for the user to communicate with the system and performs the system dedicated actions which the user desires.

Figure 2 shows the mobile client architecture.

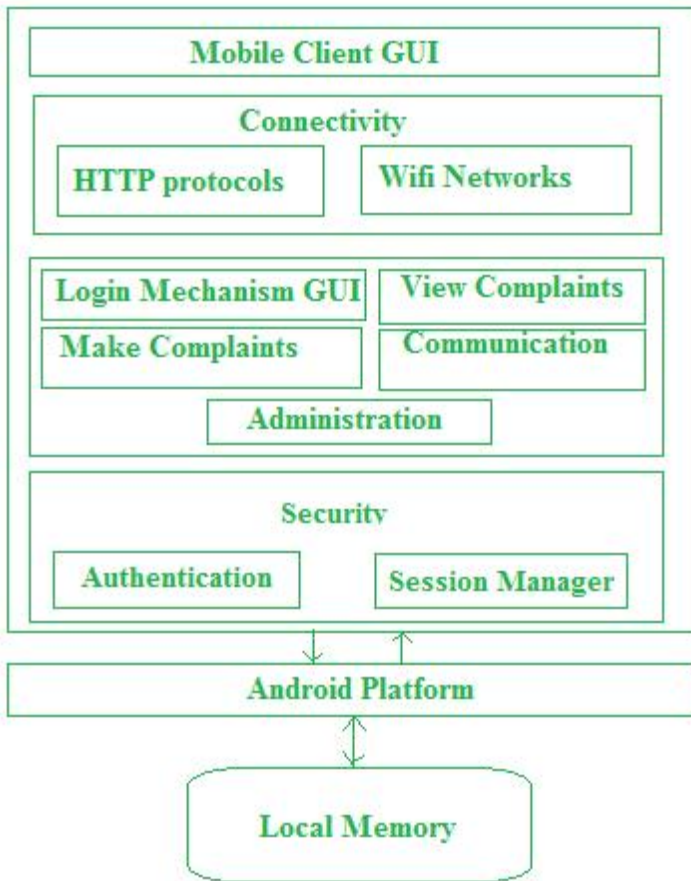


FIGURE 2. MOBILE CLIENT ARCHITECTURE

Mobile Client GUI- This is where the user interacts with the system through the user interface that is built for mobile.

Authentication- The users of the system are Customers, staff working in the complaint management system and each user is assigned a unique role. Thus after

a successful authentication of the user, each user will have access to a particular set of modules in the system with respect to the role of the user.

Session Manager- The duty of this module is to have a continued session between a login and a log out of the user. This way we could keep track of the data and the functions performed in a particular session.

Administration- The administration modules endows the administrator of the system with the permission and accessibility which the admin uses to add or remove features, client and access.

Connectivity- Through this module the user utilizes a network to access the complaint management service.

Local Memory Storage – This module helps the user to store the data temporarily in the cache of the device which reduces the database round trips made to the database for bringing or loading the data which is requested.

3.2 SOFTWARE DESIGN

3.2.1 USER CHARACTERISTICS

There are 3 types of users in the system

1. Administrator:

Administrator has a central control over the system.

2. Service Man:

Service man is the person to whom the complaint filed is sent. Once a complaint is received, a service person can commence its work. If possible a service man can solve a complaint just by simple message communication with the user.

3. Customer:

A customer can register a complaint. The customer communicates with the service man of the company, organization or institution regarding the complaint.

3.3 CONCEPTUAL SYSTEM DESIGN

The Conceptual system Design gives us an overview of the system. It explains the various components involved in the "complaint management system" and their interactions with each other to achieve the process of complain handling.

Figure 3, shows the conceptual system design of the system

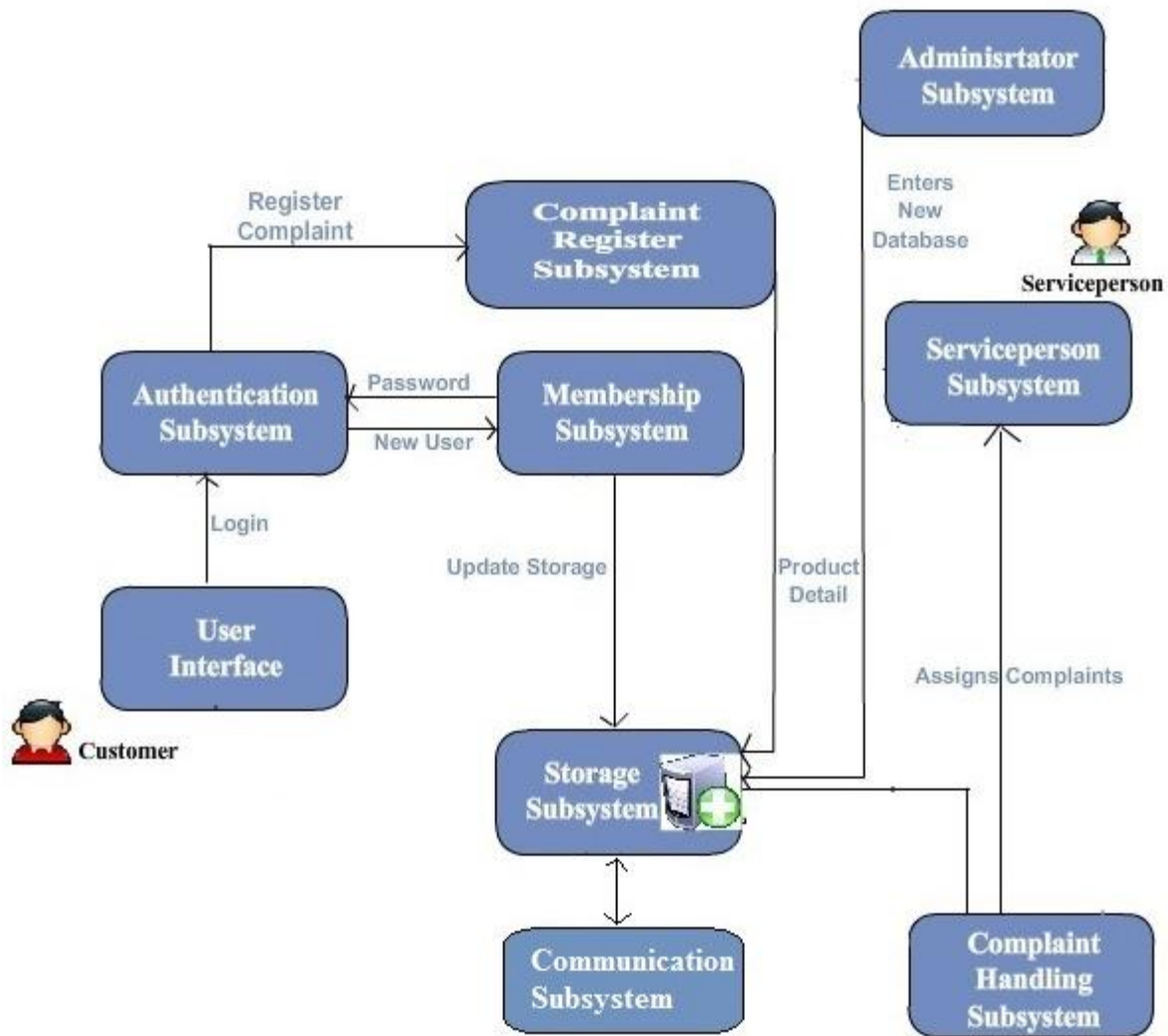


FIGURE 3. Conceptual system Design

3.4 SUBSYSTEM DESCRIPTION:

3.4.1 SUBSYSTEM FOR USER INTERFACE

Various users of the system use the User Interface Subsystem for logging into the system and depending on the user role, only relevant functions are visible to the user. The objective of this module is to provide a user friendly interface which provides user an easy interaction with the system.

3.4.2 SUBSYSTEM FOR AUTHENTICATION

Validation of the user is the main objective of this module which authenticates the user depending on the username and password supplied by the user. Once validation phase is over, it provides a channel through which a user could access the principal functions of the system.

3.4.3 SUBSYSTEM FOR MEMBERSHIP

This subsystem is relevant to the member details of the customer which are stored while registering a user. And then this information saved during registration is used by the authentication subsystem for authenticating a user. It creates the valid member profile which is stored in the database.

3.4.5 SUBSYSTEM FOR SERVICEMAN

After the registration of the complaint is done, the complaint is assigned automatically and quickly to appropriate serviceman by the complaint handling subsystem. Then the service person subsystem works on the complaint and if necessary can directly communicate with the customer for resolving the complaint as soon as possible.

3.5 SYSTEM MODELING DESIGN

The Overview of the Database Schema in the complaint management system is as shown below:

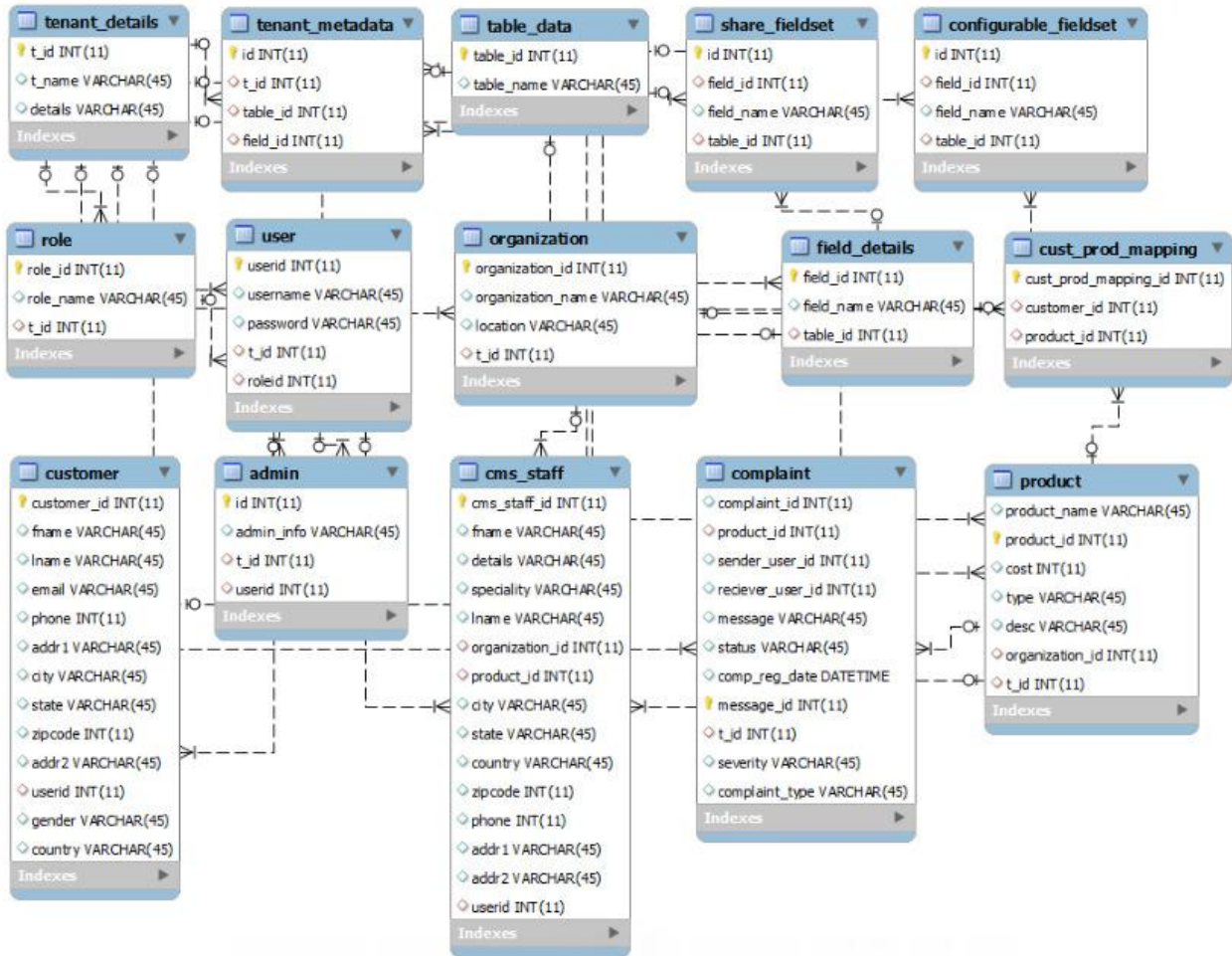


FIGURE 4: ER diagram for entire data base schema

The above database schema shown in figure 4 can be superficially divided into two sub database schemas.

- A) The first part contains the tables which contain the data with respect to the business; in this case it is a complaint management system.
- B) The second part in the system consists of the tables that maintain the configuration of the required business tables which the organization or institution desires to work with.

A) Database Schema for the first part of the sub data base is shown in figure 5 below

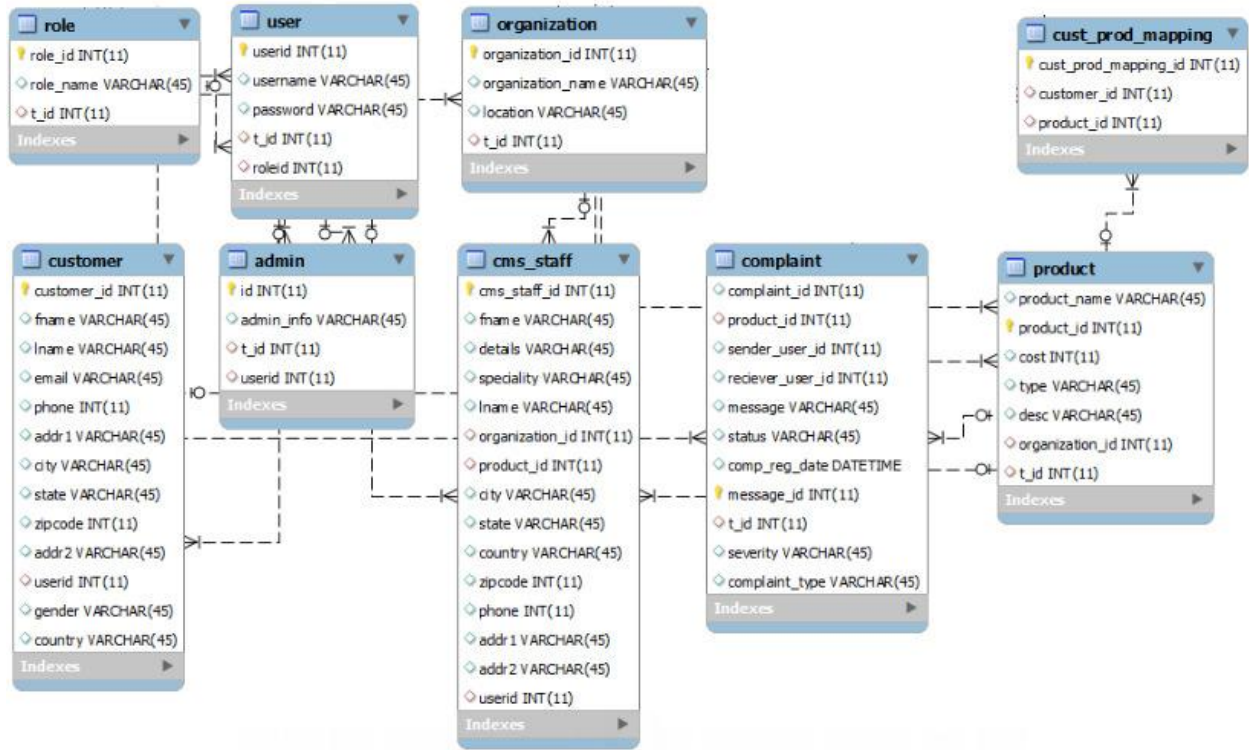


Figure 5: ER diagram for the system

Figure 5 schema contains the following tables which are listed below and every table contains a field called tenant_id (in this case, department) which is helpful for maintaining the configuration of that particular table with respect to a particular tenant (in this case, department).

- User:

The user table contains the authentication details of every user in the system like the Username and Password. It also contains the role_id of the user which states whether a User is customer or cms_staff.

- Role:

The role table contains the details of the role a user is playing i.e the role of the customer or a role of the cms_staff.

- Customer:

The customer table inherits from the user table. It contains the details of the customer for that particular system, details of the customer like the customer_id, name etc.

- Admin

The admin table contains the details of the admin of the system.

- Cms_Staff

The cms_staff table inherits from the user table and contains the details of the staff working in the system, details of the cms_staff like cms_staff_id, name etc.

-Complaint

The complaint table consists the details of the complaint logged by the customer. Details of the complaint like the complaint_id, who has sent the complaint who will be receiving the complaint. The message communication took place between the customer and the receiver etc.

Figure 6 shows the database schema for the scan part

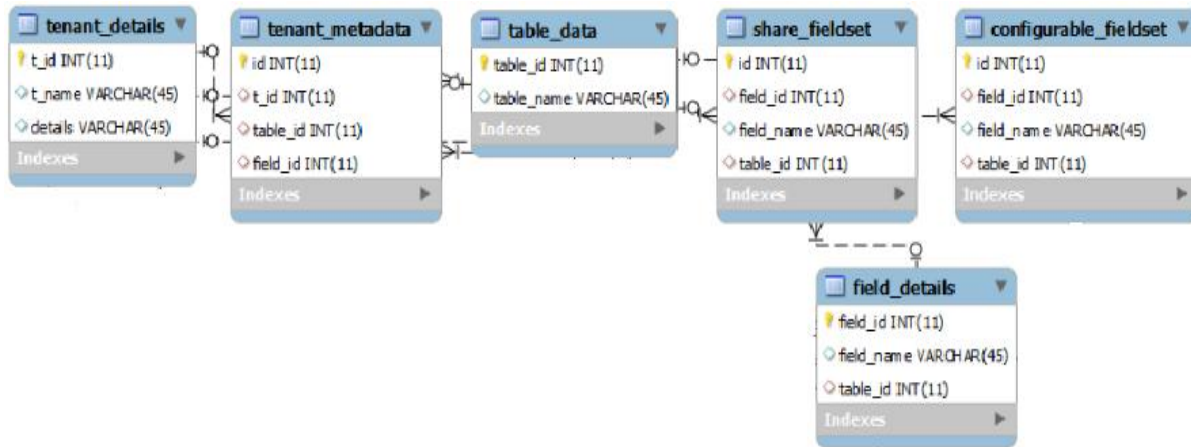


Figure 6: ER diagram for the multi-tenancy support

Figure 6 schema contains the following tables which are explained as follows. These tables actually store the configuration of the system tables with respect to the tenant id (in this case, department) stored in the system tables.

- Tenant_Details

The tenant_details table mainly stores the name and id of the tenant (in this case, department). Every organization using the system will be having a different

- Table_Data

The table data stores the ids and the names of each tables used in the system.

- Field_Details

The field table stores the field specific information like which table the field belongs to and the name of the field in that table.

- Shared_Fieldset

The share_fieldset table stores the values of the fields of the table which are shared. Usually these fields are the fields which every organization of the system should contain.

- Configurable_Fieldset

The configurable_fieldset stores the values of the fields of the table which are configurable, that is, the fields that some organization may require and some may not.

- Tenant_Metadata

The tenant_metadata table stores the mapping of each tenant to table and each table to field mapping. The administrator of the system here decides which tenant (in this case, department) will be having which tables and which tables will be having which fields.

Thus, in this way a Multi-tenant database is created which could support multiple organizations as the database built can be shared between the systems of the same type.

Now for interacting with the Multitenant database the most important thing of all is the tenant_id as it will be unique with respect to an organization. Hence whenever a client is interacting with the system a tenant_id is sent by the client corresponding to the organization to which the user is customer.

3.6 Use cases Diagram

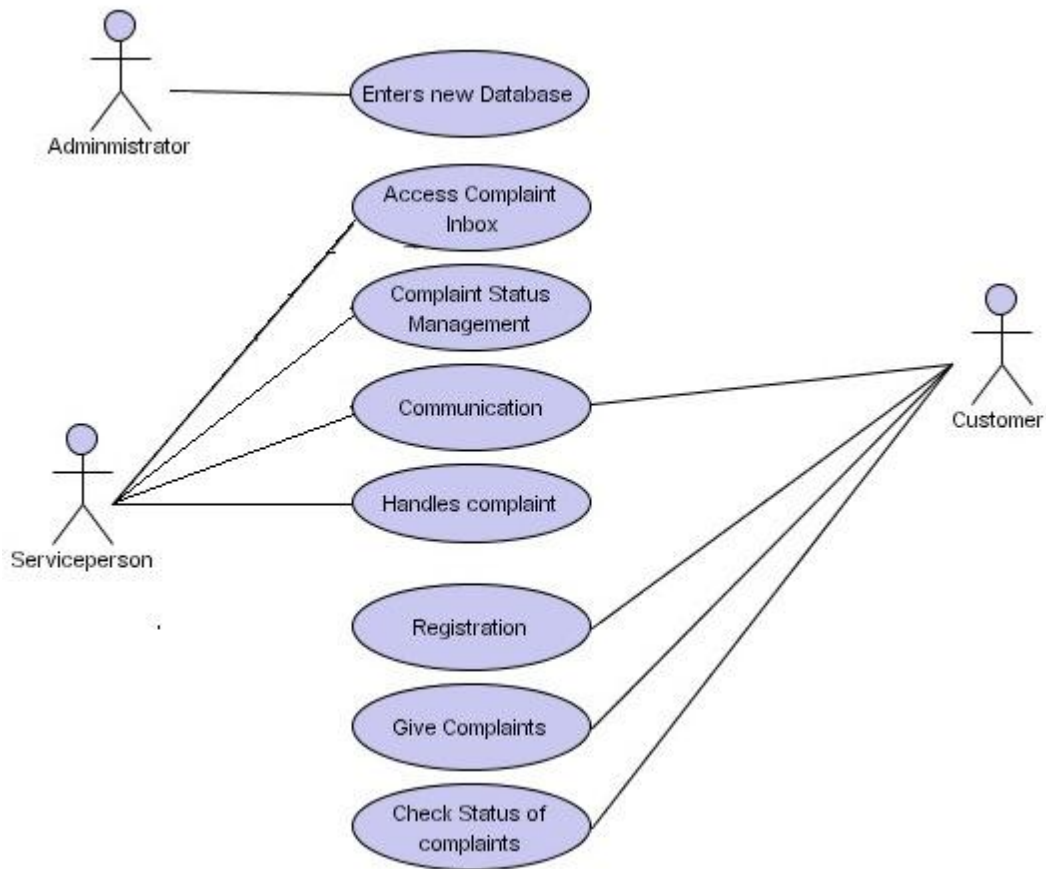


Table 2 shows the user case description of the system

TABLE 2.USE CASE DESCRIPTION

Use cases	Description of use cases
Registration	Customer creates an account in the system in using this function.
Give complaints	Customer logs his/ her complaint using this module once he/she is authenticated.

Handles complaints	The complaint is handled by the serviceman.
Communication	With the help of this module the customer as well as the serviceman communicated with each other.
Access complaints	The complaint is directly routed in the complaint inbox of the service man.
Modifications in data base	The administrator is provided with full access to the system so that he can make necessary changes as when required.

3.6.1 Description of Sequence

The sequence of the events that takes place in the system is as follows:

- Customer signs in.
- Validation of the user takes place through Authentication Subsystem
- Registration of the complaint takes place.
- The database stores the complaints.
- The complaint handling system assigns the complaint to an appropriate serviceman.
- Customer communicates with the customer for fast resolution of the complaint.

- Once the complaint is resolved the serviceman updates the status of the complaint.
- Administrator manages the system

Program Flow Diagram

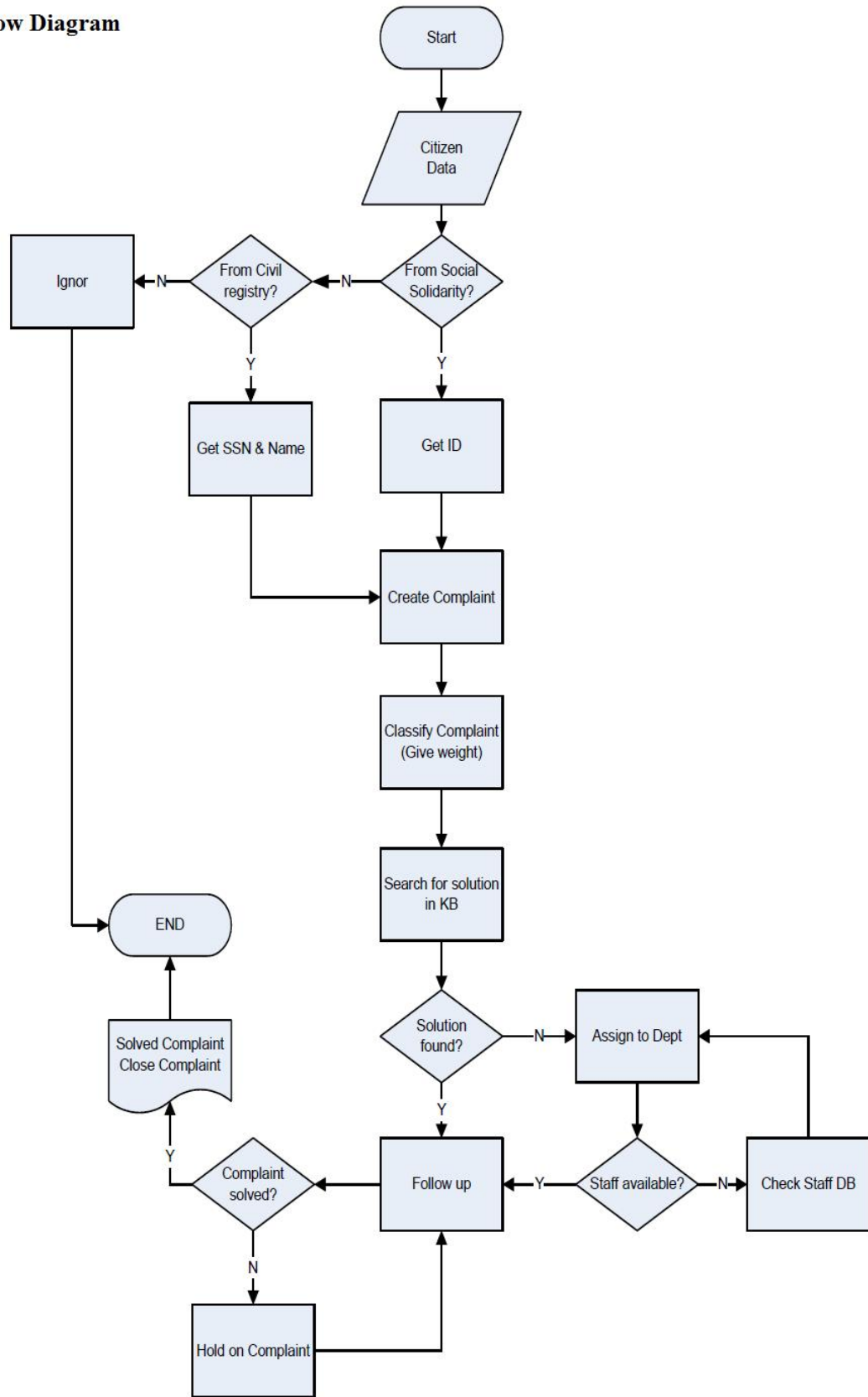


fig.7. Propose work Flow Process

figure 7 shows the paper work flow process

Figure 7 shows the main processes in the working flow process of the proposed model. First, verifying the user validity, then creating the User complaint followed by a detailed processes to manage each complaint according to it's classification priority and searching in the knowledgebase for related reference or similar case in order to find a quick handling procedure for finding a solution with the contribution of the responsible staff who will be dedicated to identify the rules on how to solve and get appropriate solution.

Figure 8 shows the system diagram

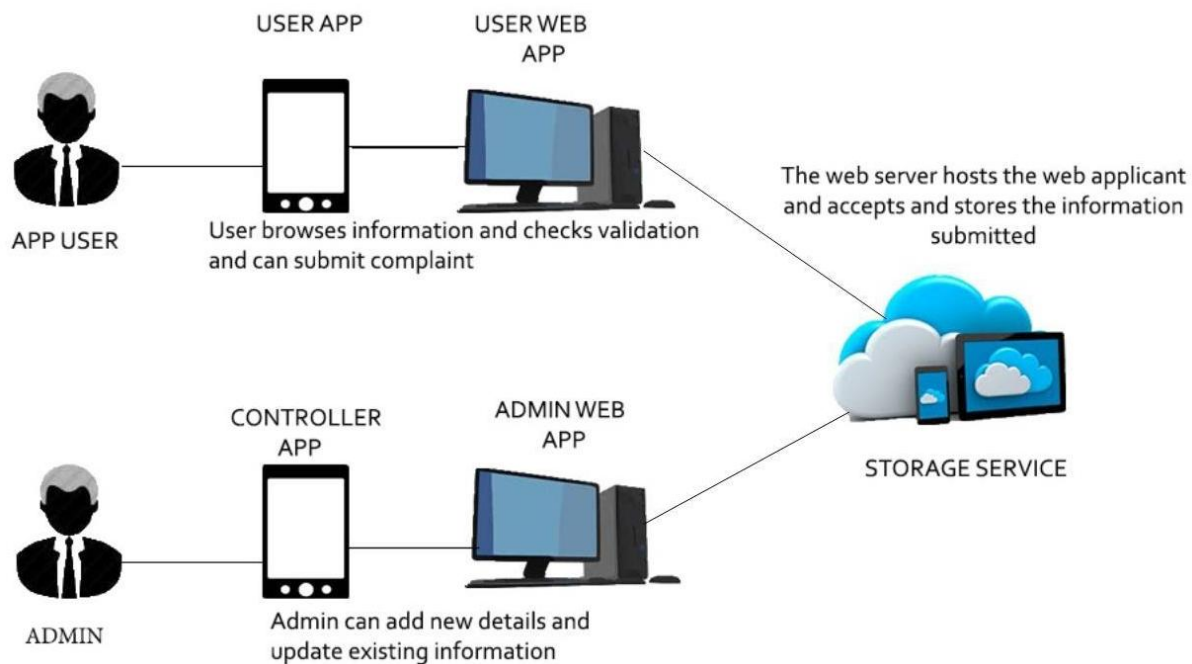


Fig. 8 System diagram

3.7 System Diagram

From the above diagram, a user runs the application from an internet enable Smartphone or tablet running an Android mobile operating system. The user can then browse and log on a register his or her complaint and also get a report as schedule. The user can equally access the web app over a desktop computer connected to the internet which then connects to a server for exchange of data and information. The administrator also has a controller application as well as the admin web application to sign in to the back end.

3.8 Data Flow Diagram

Figure 9 shows the data flow diagram of the administrator

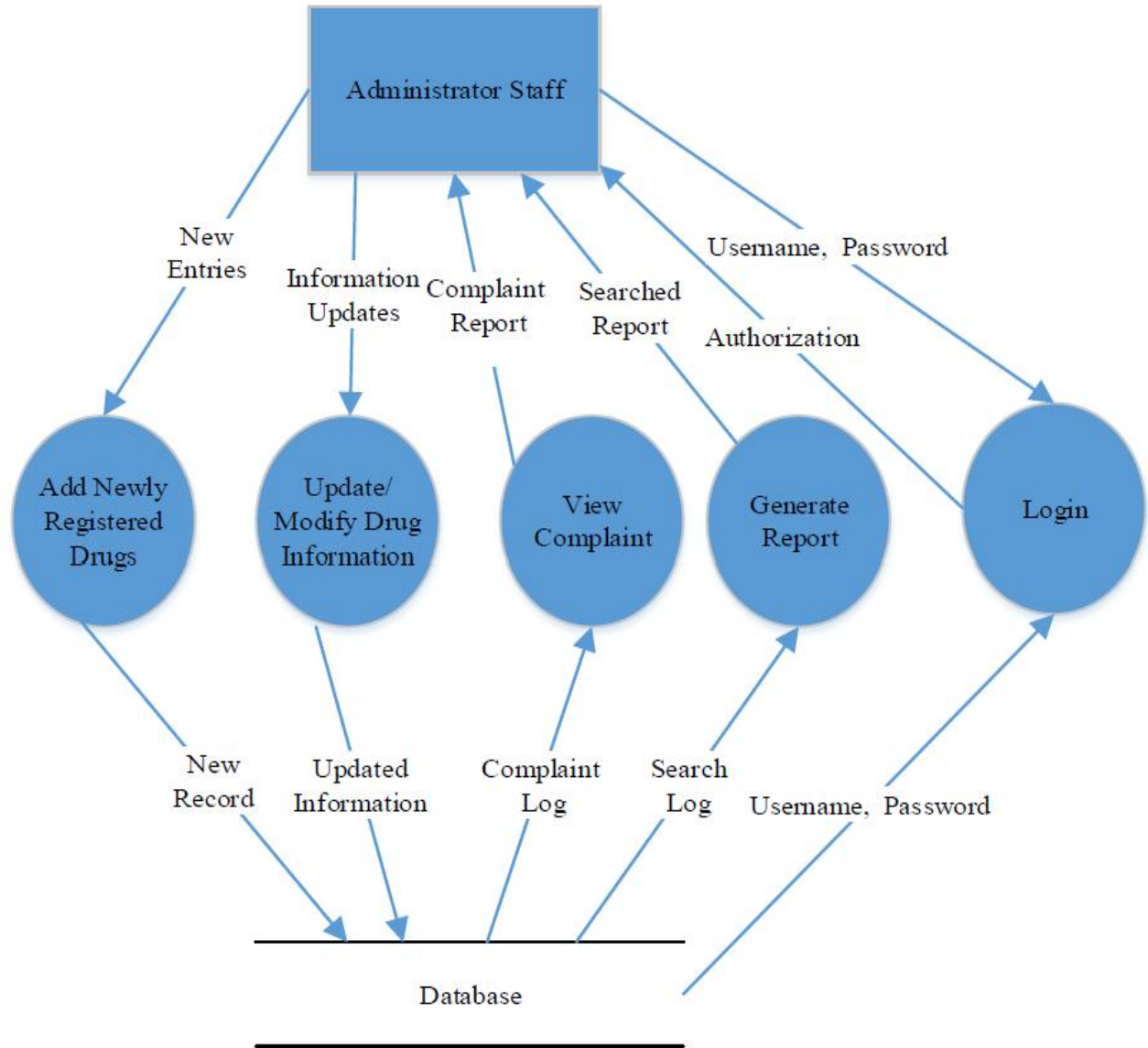


Figure 9: Data Flow Diagram for Administrator

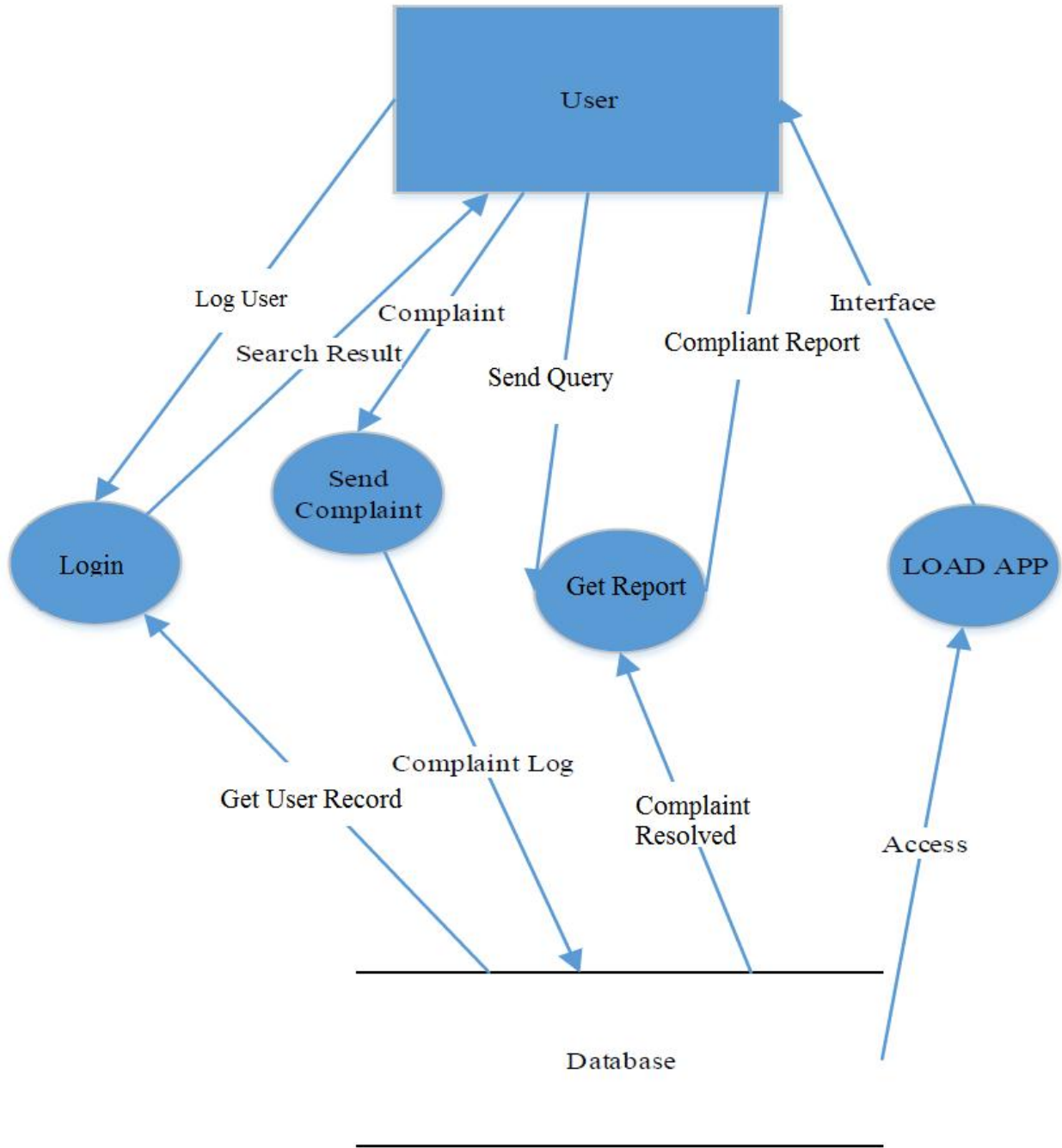


Figure10: Data Flow Diagram for User

The data flow diagram describes and analyzes the movement of data in a system. The transformation of data from input, through processing, to output, may be

described logically and independently of physical components associated with the system.

CHAPTER FOUR

SYSTEM IMPLEMENTATION AND EVALUATION

4.1 INTRODUCTION

This chapter deals with the system implementation and testing, the new system will be implemented and tested on different platforms to evaluate working performance. The implementation process and testing will be discussed here, program choice and system requirement too will be discussed. Implementation is the final phase in the System Development Life Cycle, during which the system is actually built. This is the phase that usually gets the most attention, because for most system it is the longest and most expansive single part of the development process.

4.2 PROGRAM LANGUAGE JUSTIFICATION

4.2.1 PHP

PHP stands for Hypertext Preprocessor. It is an open-source server-side scripting language used for dynamic web development and can be embedded into HTML codes.

PHP being a server-side language, the entire workflow is on the server itself. A PHP interpreter is also installed into the server to check for PHP files. While on the client-side, the only requirement is a web browser and internet connection. When the client requests the webpage on the browser, the server (where PHP software is installed) checks for the PHP file associated with the request. If found, it sends the file to the PHP interpreter (since PHP is an interpreted language), which checks for requested data into the database. The interpreter then sends back the requested data

output as an HTML webpage (since a browser does not understand .php files). The web server receives the HTML file from the interpreter and it sends the webpage back to the browser.

4.2.2. HTML

Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included clues for the appearance of the document. HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as `img` and `input` directly introduce content into the page. Other tags such as `p` surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.

4.2.3. MYSQL

MySQL (*/ˌmaɪˌɛsˌkjuːˈɛl/*) is an open-source relational database management system (RDBMS). Its name is a combination of My, the name of co-founder Michael Widenius daughter and SQL, the abbreviation for Structured Query Language. MySQL is free and open-source software under the terms of the GNU,

General Public License, and is also available under a variety of proprietary licenses. MySQL was owned and sponsored by the Swedish company, MySQL AB, which was bought by Sun Microsystems (now Oracle Corporation). In 2010, when Oracle acquired Sun, Widenius formed the open-source, MySQL project to create MariaDB. MySQL is a component of the LAMPweb application software stack (and others), which is an acronym for Linux, Apache, MySQL, Perl/PHP/Python. MySQL is used by many database-driven web applications, including Drupal, Joomla, phpBB, and WordPress. MySQL is also used by many popular websites, including Facebook, Flickr, MediaWiki, Twitter and YouTube.

4.3 SYSTEMS REQUIREMENT

After the development of the required application and test running it, the application has some basic requirement and features which must be met before the application can run, these requirements are in two groups.

4.3.1 Hardware Requirement

This is the aspect concerned with the physical component of the mobile device needed for the effective operation of the new system designed. The software will run well with a device with the under listed hardware specification:

- Dual core 100 MHz or compatible or higher
- 100MB phone memory disk space minimum
- 152MB RAM (recommended minimum)
- 0.5GB MB RAM (recommended)

- 1GB Memory space (recommended)

4.3.2 SOFTWARE REQUIREMENT

This aspect specifies the various events the proposed system would be able to perform the user's perspective in order to ensure a good and working system.

The following are the software needed for the smooth running of the package

- Microsoft office2003 and above
- Adobe Reader 9.0 or higher
- Internet Access.

4.4 IMPLEMENTATION DETAILS

This is where all the result of this project work is implemented. The software does not only have to be considered from the point of view of logistics functionality but from the technical perspective. The whole of the system was tested and found proven to be of the expectation required, and every other units were also tested, the compatibility was tested, the platform on which it runs, the system connectivity and system security.

4.5 PROCEDURE TESTING PLAN

The descriptions and testing phase of each, from modules and sub modules in the system or program are described as follows:

4.5.1 CLIENT IMPLEMENTATION FORMS

This interface gives the user a form to login to the system, or gain access to the system.

Figure 4.1 shows the UI for log in screen for user

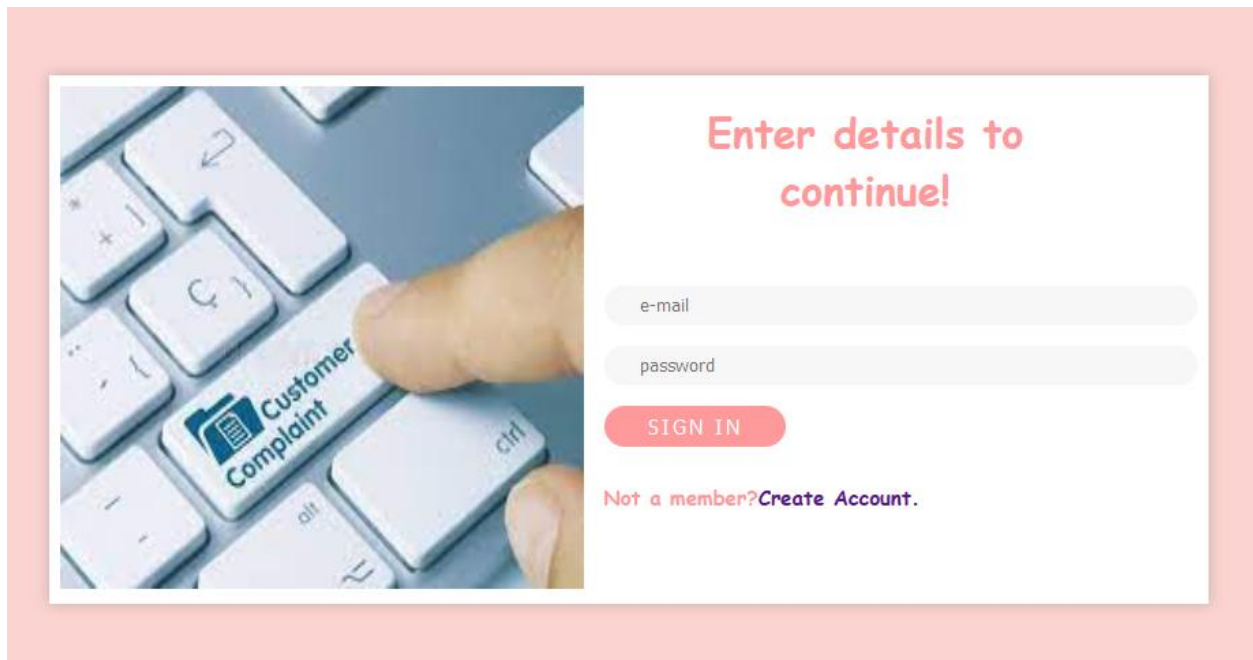


Figure:4.1 UI for Login screen for user

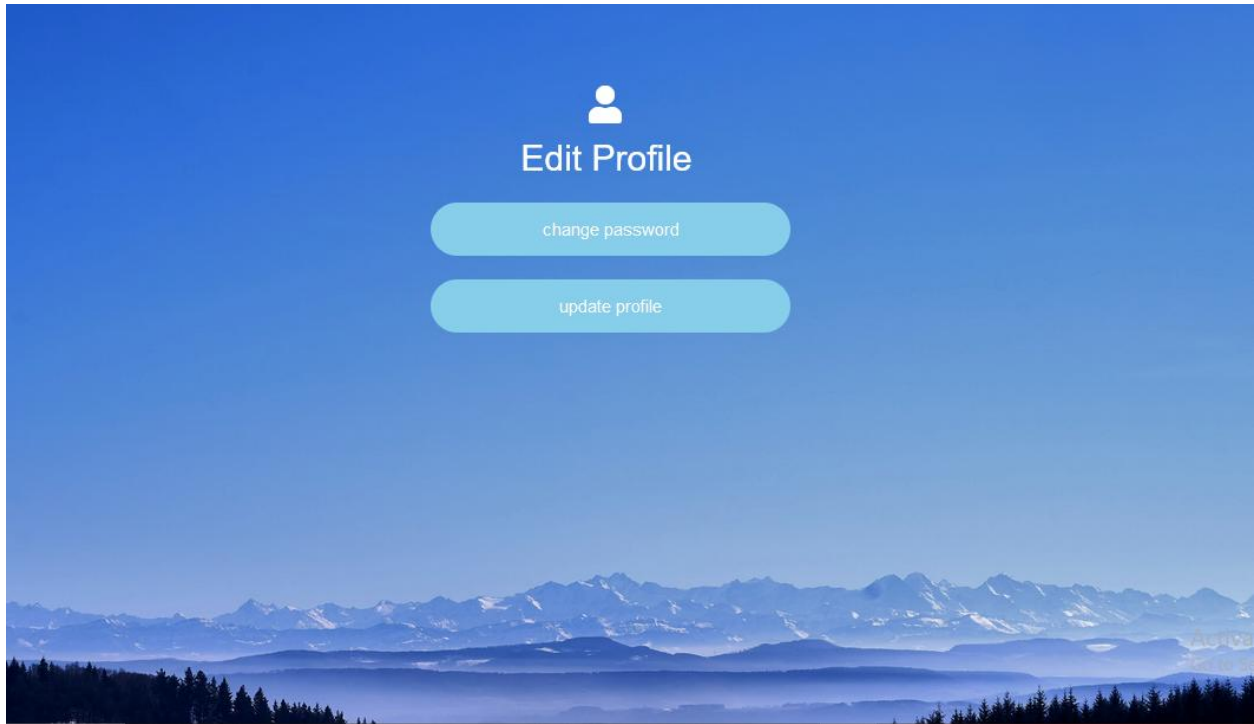
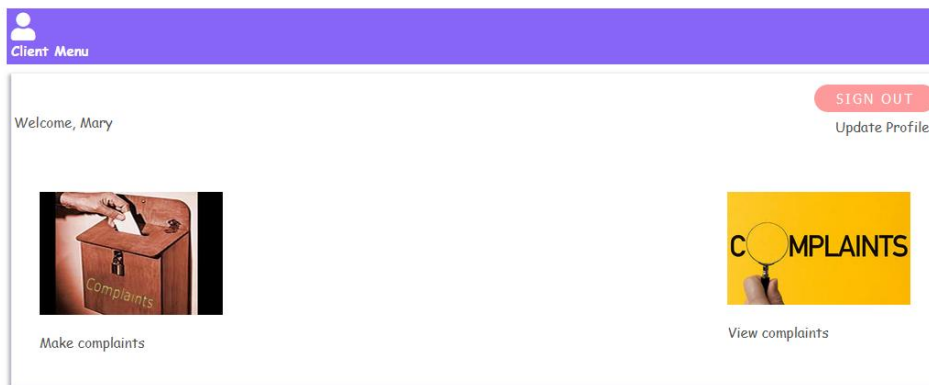


Figure 4.2 shows the UI for editing profile for user

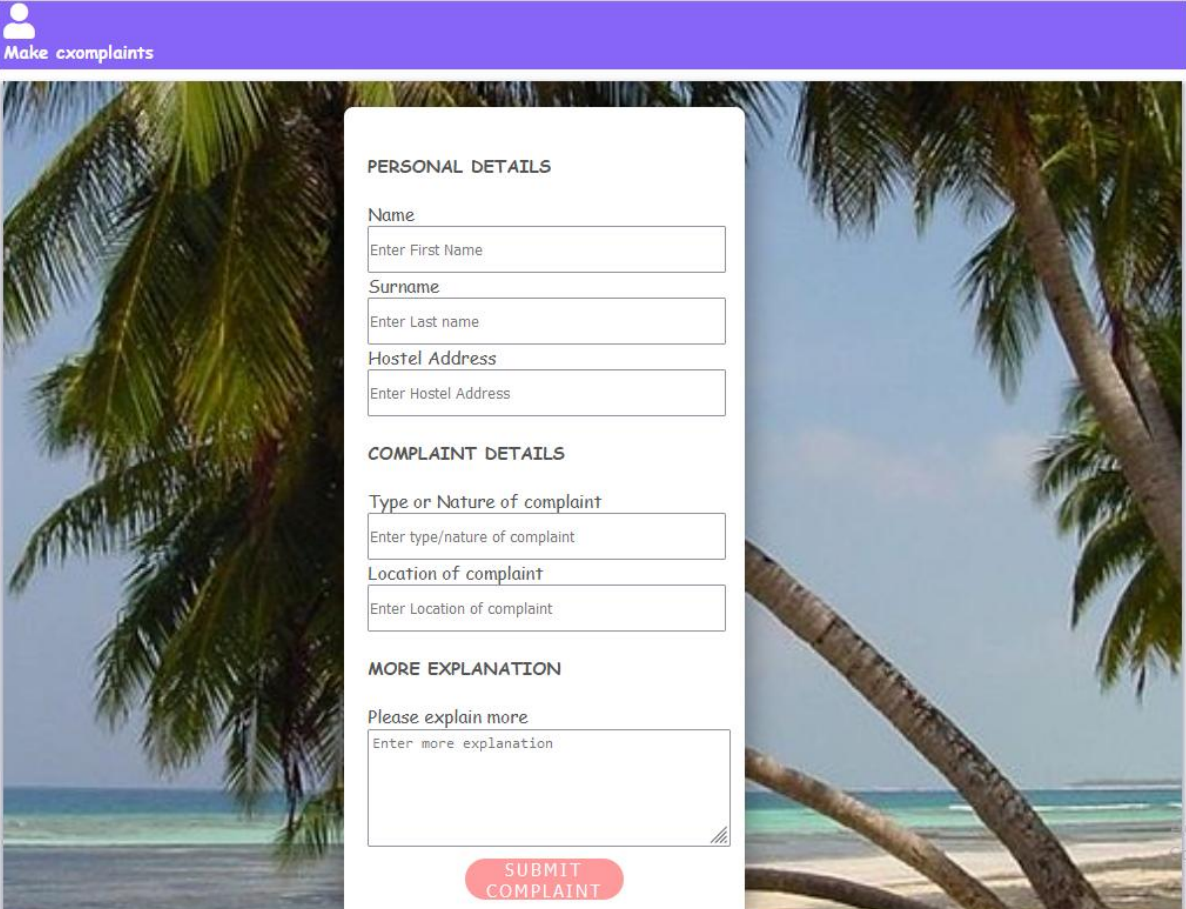
Figure 4.3: shows thee UI for complints for the user

Client Menu



Make complaints form

Figure: 4.4 shows the UI for registering a complaint by a user



The image shows a mobile application interface for submitting a complaint. At the top, there is a purple header with a user icon and the text "Make complaints". The main content area features a white form overlay on a background image of a tropical beach with palm trees. The form is organized into three sections:

- PERSONAL DETAILS:** Contains three input fields: "Name" (with sub-fields for "Enter First Name" and "Enter Last name"), "Surname" (with "Enter Last name"), and "Hostel Address" (with "Enter Hostel Address").
- COMPLAINT DETAILS:** Contains two input fields: "Type or Nature of complaint" (with "Enter type/nature of complaint") and "Location of complaint" (with "Enter Location of complaint").
- MORE EXPLANATION:** Contains a text area labeled "Please explain more" with the placeholder "Enter more explanation".

At the bottom of the form is a red button with the text "SUBMIT COMPLAINT".

4.5.2 ORGANIZATIONAL STAFF PAGE

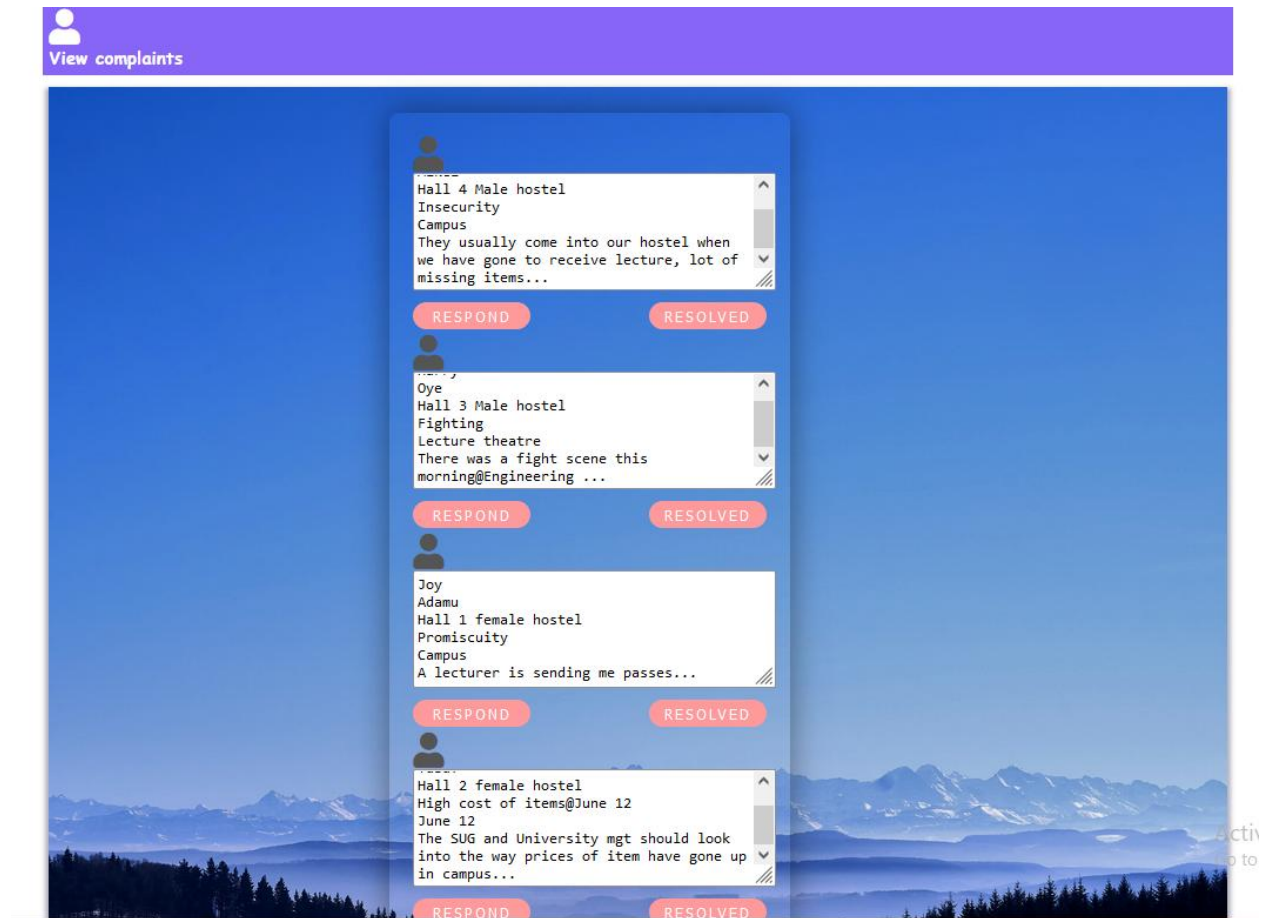
This module allows the staff of the organization designated to attend to the complaints, to view them and respond appropriately.

Figure 4.5 shows the UI for complaint for the CMS staff



STAFF VIEW COMPLAINTS REPORT

Figure 4.6: shows the UI for viewing the compliant and its status for user



4.6 RESULTS EVALUATION

Prototyping was extensively used by the team in developing the application. There was the first iteration of the prototype and subsequent prototyping iterations which were used to resolve issues and to bring performance closer to the final build, wherein consumers or users can now log complaints on Mobile App (Android). This system allowed users with smart phones running the Android mobile operating system.

4.6.1 ADEQUACY AND COVERAGE

The system software can perform the following functions:

1. Log in a complaints from User
2. Search for previous complaints
3. Print report on each search or operation

4.6.2 Efficiency and Effectiveness

1. The system communicates directly to the organization, gets desired query from the organization's database and return search results.
2. The end users can make a report and get solutions to his/her report/complaints adequately.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The online complaint management system was developed for desktop computers and smart phones, it implemented successfully. Users will successfully and easily adopt interaction with the system, reasons being that it has:

1. Easy to use User Interface designs on both desktop and mobile applications.
2. Fast and seamless application feedback.

The application was developed with the above factors as a standard.

The application worked and looked similar on a variety of different browsers. The testing was done on the most popular browsers which are:

1. Mozilla Firefox
2. Google Chrome
3. Microsoft Internet Explorer
4. Opera
5. Safari

The administrative application was tested on the major browser platforms, to ensure that the user experience is uniform throughout the different browsers. The application was also tested on the popular Opera mini mobile browser on a mobile device with Internet capabilities. The layout of the web application loaded beautifully with all the colors, button and logo of the application.

5.2 Conclusion

The application software has been computed successfully. It was also tested successfully by taking test cases. It is user friendly and has required options which can be utilized by the user to perform the desired operations.

The application software meets the information requirements specified to a great extent. The system has been designed keeping in view the present and future requirements in mind and made very flexible.

The goals that are achieved by the software are instant access, improved productivity, optimum utilization of resources, efficient management of records, simplification of the operations, less processing time and getting the required information, user friendly, portable and flexible for further enhancement.

5.3 Recommendation

The study recommends this application to all organizations, to help their clients and patronizers report any issue they have with the service(s) rendered to them in any form, either dissatisfaction, poor service delivery, molestation, abuse, shortage, over supply, wrong delivery, delay or others.

REFERENCES

Wilkinson (2016). The fair guiding principles for scientific data management and stewardship. Marcus (2000). Emotions in politics.

Stauss, & Andreas (2004). Complaint management profitability: what do complaint managers know? *Managing Service Quality* 14:2/3, 147-156.

Stauss, Bernd & Wolfgang Seidel (2004). *Complaint Management: The Heart of CRM*.

De Matos, Augusto Celso, Carlos Alberto Vargas Rossi, Ricardo Teixeira Veiga & Valter A.V (2009). Consumer reaction to service failure and recovery: the moderating role of attitude toward complaining. *Journal of Services Marketing* 23: 7, 462–475.

Heskett, J., T. Jones, G. Loveman, W. Sasser, Jr., & L. Schlesinger (1994). Putting the Service-Profit Chain to Work. *Harvard Business Review* March-April, 164-174.

Huppertz, John W. (2007). Firms' complaint handling policies and consumer complaint voicing. *Journal of Consumer Marketing* 24: 7, 428-437.

Hansen, Scott W. (1997). Power as a predictor of industrial complaining styles in a buyer/seller relationship: the buyer's perspective. *Journal of Business & Industrial Marketing* 12: 2, 134–148.

Hansen, Scott W., John E. Swan & Thomas L. Powers (1996). Encouraging "Friendly" Complaint Behavior in Industrial Markets. *Industrial Marketing Management* 25, 271–281.

Hansen, Scott W., John E. Swan & Thomas L. Powers (1997). Vendor Relationships As Predictors of Organizational Buyer Complaint Response Styles. *Journal of Business Research* 40, 65–77.

Barlow, Janelle & Claus Møller (1996). *A Complaint is a Gift*. San Francisco etc.: Berrett-Koehler Publishers. ISBN 1-881052-81-8.

Fundin, Anders P. & Bo L. S. Bergman (2003). Exploring the customer feedback process. *Measuring Business Excellence* 7: 2, 55–65.

Jones, Thomas O. & W. Earl Sasser, Jr. (1996). Miksi yritys menettää tyytyväisiä asiakkaita? *Yritystalous* 3, 53–64.

Teng, Gary S., Michael S. Ho & Debra Shumar (2005). Enhancing supply chain operations through effective classification of warranty returns. *International Journal of Quality & Reliability Management* 22: 2, 137–148.

Johnston, Robert (2000). Linking complaint management to profit. *International Journal of Service Industry Management* 12: 1, 60-69.

Liu, R. & Peter (2001). Recognizing cross-cultural differences in consumer complaint behaviour and intentions: an empirical examination. *Journal of Consumer Marketing* 18: 1, 54-74.

Martín-C, Juan I & Oscar R (2008). EFQM model: knowledge governance and competitive advantage. *Journal of Intellectual Capital* 9: 1, 133-156.

Vareila-Neira, C, Rodolfo V.C & Victor I (2010).

Explaining Customer Satisfaction with Complaint Handling. *International Journal of Bank Marketing* 28: 2, 88-112.

Fornell, C & Birger Wt (1988). A Model for Customer Complaint Management. *Marketing Science* 7: 3, 287–298.

Bosch, V.G & Francisco T. E(2005). TQM and QFD: exploiting a customer complaint management system. *International Journal of Quality & Reliability Management* 22: 1, 30-37.

Gruber, T., S. C. Henneberg, B. Ashnai, P. Naudé & Reppel. A (2010). Complaint resolution management expectations in an asymmetric business-to-business context. *Journal of Business & Industrial Marketing* 25: 5, 360–371.

Grönroos, C (1988). Service Quality: The six criteria of good perceived service quality. *Review of Business* 9: 10–13.

Womack, James P. & Daniel T. Jones (2005). *Lean Solutions: How Companies and Customers Can Create Value and Wealth Together*. New York etc.: Free Press. ISBN 0-7432-7778-3.

Womack, J. P. & Daniel T. Jones (1996). *Lean thinking: Banish waste and create wealth in your corporation*. New York etc.: Simon & Schuster Inc. ISBN 0-684-81035-2.

Womack, James P., Daniel T. Jones & Daniel Roos (1990). *The Machine that Changed The World*. New York etc.: MacMillian Publishing Company. ISBN 0-89256-350-8.

Owens, Deborah L. & Douglas R. Hausknecht (1999). The Effect of Simplifying the Complaint Process: A Field Experiment with the Better Business Bureau. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behaviour* 12, 35-43.

Hirschman, Albert O. (1970). *Exit, Voice, and Loyalty*. Cambridge etc.: Harvard University Press. ISBN 0-674-27660-4.

Homburg, C. & A. Fürst (2005). How organizational complaint handling drives customer loyalty: an analysis of the mechanistic and the organic approach.

Journal of Marketing 69: 3, 95–114.

Bitner, Mary J., Bernard H. Booms & Mary S. Tetreault (1990). The Service Encounter: Diagnosing Favorable and Unfavorable Incidents. *Journal of Marketing* 54, 71- 84.

Advocacy research (2021). Students as Change-Makers: Five steps to advocacy research.

Kolsky (2015). Think jar and think tank organization.

Surbhi, S. (2018). Difference Between Basic And Applied Research. Retrieved from <https://keydifferences.com/difference-between-basic-and-applied-research.html>

IONOS (2019). Microsoft exchange 2019 administrative tool.

ITU (2012). *Measuring the information society 2012*.