**Grievance Reporting & Addressing System**

By

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An Information Systems Project Proposal Submitted to the Faculty of Information in partial fulfilment of the requirements for the award of Bachelor of Business Information Technology.

Bachelor of Business Information Technology

**Strathmore University**

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# Declaration and Approval

I **076431** declare that this project has not been submitted to any other University for the award of a Degree in **Bachelor of Business Information Technology**

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# Abstract

The role of the heads of institutions and government have had bestowed upon them the single important role of leading and governing the people beneath their authority. However, they are also charged with the onus to address the issues that plague their subordinates. Everything from poor quality of service, to security concerns, degradation of infrastructure, unconducive working conditions, among others. With the increase of population levels however, the task of efficiently and effectively addressing these issues becomes harder on the leaders and all other persons of whom this is required. Even with the establishment of methods through which these issues can be channelled, there is still a challenge in properly addressing the problems being faced. Currently in use are suggestion boxes, which are effective where the population is relatively small, as well as forums where various stakeholders can meet and deliberate to come up with a way forward. As mentioned, though, high population compounds the addressing of the issues that citizens may have. As a result, I seek to provide a means through which citizens can channel all their issues, and concerned players in government can receive these issues, and use the method as a way to prioritize the problems and effectively solve them, ensuring quality delivery of government services, and improved quality of life for citizens.

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# Chapter One: Introduction

## Background

The role of government is to govern the citizens of a demarcated geographical area. More than this however, governments also have the responsibility of solving the problems that their citizens face, as well as providing necessary amenities so that the citizens have a conducive environment within which they can thrive.

In order effectively to address the issues raised by citizens though governments need a means to receive the issues first. In small organizations, there has been implementation of the use of suggestion boxes in which people can drop in their written problems, suggestions and issues. The authorities then collect these issues periodically and use them as a guide to address the problems faced within their organizations.  
On the Internet also, there are various message boards/ forums in which people with similar interests can come online and report problems that they are facing, and through these forums, manufacturers and service providers can provide solutions to their users.

On a large scale, such as a county, it becomes exponentially difficult to have and maintain suggestion boxes in which citizens can drop their written concerns. Throughout the county, there will likely be hundreds of boxes, each of which have to be periodically emptied, and the contents analysed in order to come up with a plan to properly address the issues contained therein. This is a long and tedious process, especially because of the large numbers. The ripple effect of this is the inefficiency in the county government’s attempt to provide good quality services to its citizens.

The system that is to be built seeks to address the shortcomings faced by the county governments in addressing their citizens’ issues.

## Problem Statement

Currently, there isn’t in existence an efficient and effective way through which issues can be channelled to the relevant authorities, neither is there a way for the relevant authorities to effectively address the problems that they receive from citizens.

## Aim

To develop a system through which citizens can channel their issues and concerns, and to provide a way in which authorities can view these issues that are brought up, in order to properly address them.

## Specific Objectives

1. To design a system that will allow citizens to channel their grievances and issues
2. To design a portal through which county governments can receive concerns raised by citizens in their specific counties
3. To build a grievance reporting and addressing system
4. To run usability tests on the built system

## Justification

The current methods in which issues are channelled (suggestion boxes, occasional meetings) have proved to be inefficient in solving the problems faced by citizens. There is a large number of citizens per county, and receiving all the concerns from them is cumbersome for the county governments. With the large number of concerns, it is difficult to determine which of the issues is of high priority (on the basis that it has been raised numerous times). By developing this system I intend to reduce, if not totally remove the inefficiencies of the current systems in place.

## Scope

For the pilot of the system, the scope shall be limited to Nairobi county, with initial testing being done within Strathmore University, to test the feasibility of the solution being provided, before the system is rolled out on a larger scale.

# Chapter Two: Literature Review

## 2.1 Introduction

A **literature review** is a critical analysis of published sources on a particular topic. It’s a means of assessing the literature, in order to get a summary, classification, comparison and evaluation (What is a Literature Review, 2016).  
This review will touch on the means through which government obtains, and can obtain feedback and information from citizens, means through which citizens can participate in governance, as well as explore current aspects of ways from which the developer seeks to borrow, to solve the shortcomings of information collection and public participation.

## 2.2 Government and its role

By definition, a **government** is the group of people who control and make decisions for a country, state. (Government, 2016). From the time when a government rises to power, its principle role is to provide leadership to the citizens, by coming up with policies and rules to that effect. Additionally, government has the responsibility bestowed upon it to promote the general welfare (Troolin, 2016); provide citizens with social services and amenities, in order to ensure a conducive environment for their thriving.

Off the bat, there are general ways in which government can provide these amenities, just from observation. For instance, where a drainage pipe has burst, the government can come in and expend resources for the repair of the pipe. However, a problem arises where the area of jurisdiction of the government is large. This is a logistical problem when it comes to serving the citizens effectively. In a large area, the government may have a problem in reaching all the areas under its control, and therefore may not be in a position to address problems faced in places that are not in close proximity to, say, the headquarters. As a result, citizens leaving in those areas may feel as though their government has neglected them.

Try as it may, without extensive reach, the government may not be in a position to address the issues faced by its citizens.

Additionally, there may be problems that can only be addressed if they are brought up by the citizens themselves, on the basis that the citizens experience them first hand. For example, a case in which garbage collection takes too long, and after a while, the stench coming from garbage collection areas is unbearable. Or that the street lighting system in a residential area has failed, and this has led to an increase in insecurity in the area.  
In order for the government to be aware of this, it needs to be in touch with its citizens so as to be at a better point of knowledge to address the issues they face.

So far, some governments have in place mechanisms through which citizens can channel their concerns to them. Some have suggestion boxes in their offices where citizens can drop off their written concerns. Others have set up departments concerned solely with listening to complaints and problems that citizens have. Better still, some governments are adopting an open-door policy, whereby citizens can access their leaders directly and seek audience for their problems. While all these are in place in a bid to tackle ineffective governance, they do not quite hit the nail on the head. And they have their shortcomings. For instance, with the open-door policy, the government offices are a continuous buzz of activity, which may leave little time to do actual work. Similarly, some of the problems brought forth are relatively trivial and end up consuming time that could have been used for other tasks. Additionally, not all citizens may be in a position to make their way to the government offices in order to table their concerns.

## 2.3 Citizen Participation

Since a lot of the issues that the government seeks to address, directly affect citizens, it is paramount that the citizens be given a voice through which they can raise the issues that plague them most. This will give their governments a more informed starting point in their quest to providing services to the citizens.

So far, some governments have put in place mechanisms through which citizens can interact with them directly (Nambisan, 2014), for example Citizens Connect (http://www.cityofboston.gov/doit/apps/citizensconnect.asp) in Boston and ImproveSF (http://www.improvesf.com/) in San Francisco. Locally, with the implementation of county governments after the promulgation of the new constitution, various counties have put up county government websites, on which they post different types of information about the activities happening within the county. For example Mombasa County (<https://www.mombasa.go.ke/>). Others, such as Nairobi County, have taken to social media, using Twitter (https://twitter.com/county\_nairobi) to communicate with the citizens.  
While these are good initiatives to enhance citizen-government interactions, there are still glaring issues that need to be addressed. For instance:

1. How do the governments use the data that their citizens submit through these various platforms?
2. Do they have analytics systems in place with which they can extract useful information from the data received?
3. What performance indicators do they have in place?
4. Do the governments actually use this data, or is it a front they use so as to appease their citizens?

Citizens are an invaluable asset to government in their quest to govern effectively. For instance, citizens are in a good position to take note of and report emerging and existent problems in their environment. Moreover, citizens are a gold mine of innovative ways through which civic problems can be solved, and governments can tap into this by organizing innovation competitions in order to get to see from the perspective of the citizens (Nambisan, 2014). By doing so, the governments will be capitalizing in increasing citizen-government collaboration.

Additionally, in the making of policies and the design of public service, there is need to shift from the view that the citizen is the target, and start seeing the citizen as an agent; as the centre of consideration by the policy makers. (Holmes, 2011). The citizens, in the process of policy making and public service design must be considered as co-creators with government agencies. As a result, citizens should start being viewed as consumers, and the aim should shift towards developing policies and designing services that respond to individual needs, and are relevant to prevailing circumstances (Holmes, 2011).

## 2.3 Collection of Information

### 2.3.1 Current Trends-Suggestion Boxes

As it stands today, for most governments, the means through which data is collected, with regards to providing services to a population, is the suggestion box, shown below:



Figure An example of a suggestion box

This method has been in use for a long time(as early as 1909), with users and consumers inserting slips of paper on which they’ve given feedback about the quality of good and services offered by an organization. There are pitfalls to this method, however:

1. The risk of vandalism; where vandals may destroy the suggestion boxes, rendering them unusable
2. The process of going to empty the boxes of the feedback is long and tedious
3. The process of analysing the information is painstakingly long

On a large scale, such as on the government level, these pitfalls are felt on an exponential scale, and this method so far has been minimally effective.

### 2.3.2 Case Study: Internet Forums; Stack Overflow

An **Internet forum** is a discussion area on a website. Website members can post discussions and read and respond to posts by other forum members. A forum can be focused on nearly any subject and a sense of an online community (What is an Internet Forum?, n.d.). In the forums, users get to exchange ideas and interact as part of a virtual community. Over time, these have evolved into more useful FAQ (Frequently Asked Question) pages, as well as question-and-answer sites such as StackOverflow.

On such Q&A sites, the discussions are more structured, where a registered user comes with a question on a specific topic, and other users with knowledge on the topic provide solutions to the query. The best answers are ranked highly (through ‘upvoting’); anyone with an answer similar to one already given can ‘upvote’ the earlier answer. Once a suitable solution is arrived at, the topic is closed. Where answers no relevant to the topic are given, they are removed, and the person is advised to post the answer in another topic related to his/her answer.

These Q&A sites have become increasingly popular on the Internet, and almost all consumer products have at least one community set up in order to address the problems that may arise with products or services that they may be using, for example <http://www.sevenforums.com/> established by users of the Windows 7 Operating System. Some of these Q&A sites are run by the providers of the services and products, for example <https://support.microsoft.com/> by Microsoft for its Windows line of products.

The sites usually have categories and tags, attached when the questions are posted, and these keep the site organized, helping visiting users easily find answers to question they would like to ask.

### 2.3.4 Analytics, Focus on Text Analytics

**Text analytics/mining** is the process of analysing unstructured text, extracting relevant information, and transforming it into useful business intelligence. Text analytics processes can be performed manually, but the amount of text-based data available to companies today makes it increasingly important to use intelligent, automated solutions. (What is Text Analytics?, 2016)

In order to gain useful information from huge amounts of data, it is necessary to analyse the data as it comes in. It is possible for a person, or a group of people to perform the analytics for a small amount of data. However, at the scale of an organization, more so a county, the workload increases exponentially, as does the likelihood of inaccuracies. It is therefore necessary to have in place methods through which the suggestions received by the governments from their citizens, will be analysed and the useful information be used to make decisions.

### 2.3.5 Natural Language Processing

**Natural Language Processing/Computational Linguistics** is a branch of artificial intelligence that deals with analysing, understanding and generating the languages that humans use naturally in order to interface with computers in both written and spoken contexts using natural human languages instead of computer languages (NLP, n.d.).

Natural language processing’s importance cannot be overemphasised, in the case where a machine will be used to collect feedback from citizens, and thereafter analyse it. It will be necessary for the computer to understand the data in the same way a human being would. This can be achieved by the use of bots; a bot is software that is designed to automate the kinds of tasks you would usually do on your own (WAGNER, 2016). The data received by the government will need to be run through a bot for initial processing, before analytics is done on it, then useful information can be obtained.

# Chapter Three: Methodology

## 3.1 Introduction

A **methodology** is a set of methods, rules, or ideas that are important in a science or art: a particular procedure or set of procedures (methodology, n.d.).   
In software development, however, a system development methodology refers to the framework that is used to structure, plan, and control the process of developing an information system (CMS.org, 2005).

Of the various possible methodologies there are main aspects that cut across universally, as follows:

1. Software specification: the functionality of the system and constraints on its operation must be specified.
2. Software design and implementation: the system to meet the specification must be produced.
3. Software validation: the system must be validated to ensure that it executes the intended functionalities.
4. Software evolution: the system must evolve to meet changing user requirements.

## 3.2 Analysis

For the proposed system, the approach used shall be the Object Oriented Analysis and Design (OOAD) approach, while the methodology in use shall be the System Development Life-Cycle.

**Object Oriented Analysis and Design** is the procedure of identifying software engineering requirements and developing software specifications in terms of a software system’s object model, which comprises of interacting objects. (Object Oriented Analysis & Design, n.d.). The **System Development Life-Cycle** is an improvement of the traditional Waterfall Methodology, which will describe the stages involved in an information system development project, from an initial feasibility study through maintenance of the completed application (Object Oriented Analysis & Design, n.d.).

The SDLC has been chosen because there is already in existence a method to do the things that the proposed system is trying to achieve, but in an improved, more streamlined way. The steps that will be involved in this methodology are:

1. Planning;
2. Analysis;
3. Design;
4. Implementation; and
5. Maintenance

### 3.2.1 Requirements

A description of the features and behaviour of a system or software application (Inflectra, 2014)

#### Requirements Gathering

The requirements for the proposed system were drawn from the current process of operations in citizen-government interactions, and adjusted to fit a situation in which a software system would be put in place.

### 3.2.1.1 Functional Requirements

**Functional requirements** are those which define the functions of the system (Kakhata, 2013).   
For the proposed system, the functional requirements shall be as follows:

1. A user shall be able to sign up as a registered user
2. A user shall be able to log in with their credentials
3. The user shall be able to post a concern/issue/complaint
4. A user shall be able to view other issues posted by other users
5. A county government official shall be able to sign up as an administrator
6. A county government official shall be able to view issues posted by users
7. A county government official shall be able to view analytics data from the issues posted by users

### 3.2.1.2 Non-Functional Requirements

**Non-functional** **requirements** are a description of how the system should be, together with the criteria that can be used to judge the operation of the software (Kakhata, 2013).  
For the proposed system, the following are the non-functional requirements:

#### Product Requirements

The system should be available to use at any time of the day.

#### Security Requirements

The users must each have a username and password to grant them access.

#### Operational Requirements

The system must be accessible from a wide range of internet browser applications.

## System Design

**Systems design** is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. (Siddiqui, 2015)

For the proposed system, design emphasis will be on the user interface & experience, and the data storage.

## Proposed System Modules

The proposed system will have a number of key modules, among them:

1. A registered user portal; on which registered users will be able to post issues/concerns/complaints, as well as view other issues posted by other users
2. An administrator portal; where the posts made by registered users will be received and analytics will be viewable
3. A user registration panel; where new users can register to use the system, as well as reset lost credentials

## Implementation and Testing

The proposed system will undergo initial testing on completion to check for anticipated functionality and consistency within a small pilot environment-Strathmore University. If it is found to be working as expected, it will be deployed to the proposed scale, which is the county governments.

## Development Tools and Resources

A number of tools and resources shall be used in the development of the proposed system. They are as follows:

#### Atom

A versatile text editor that handles most programming languages with ease. It’ll be used to handle most of the code written for the system.

#### Adobe Photoshop

A graphics design software; it will be used in designing the user interfaces, as well as other visual content for the system.

#### AngularJS

A new and revolutionary JavaScript language, which will be used to enhance the front end user experience.

#### Xampp

A server simulation software; this will be used to simulate server functionality during the development of the system.

#### Microsoft Office Visio

A flow diagram design tool; it will be used in coming up with the use case diagrams, sequence diagrams, and activity diagrams.

#### Microsoft Project

A propriety project management software; it will be used to come up with the anticipated project schedule, which will guide the development of the system.

#### Github

An online repository which will help with version control, as well as provide a back up for the system files.

#### A selection of web browsing software

These will be used to test the system throughout the development process.

#### Trello

A web based project management tool, which helps with tracking progress of scheduled tasks.

## Deliverables

The deliverables for this project will be as listed below:

1. A Project Proposal
2. Use Case Diagrams
3. Class diagrams
4. Activity Diagrams
5. Sequence Diagram
6. User Interface designs
7. Database Designs
8. Complete system
9. System Documentation

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# Appendices

## Appendix 1: Anticipated Schedule

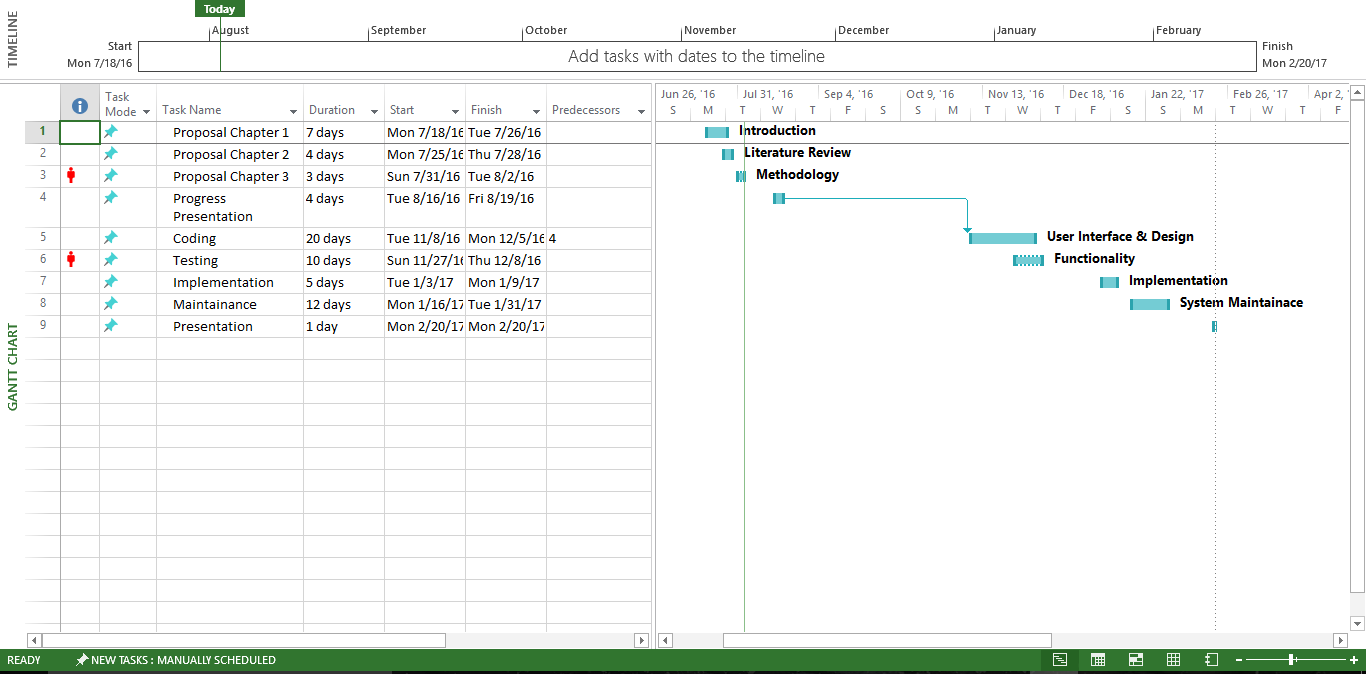


Figure Gantt Chart showing Anticipated Schedule