IMPLEMENTING A RESTful VIRTUAL NOTICE BOARD APPLICATION

BY

LEKINA MEMUSI ERIC

(BIT-001-0119/2009)

A Proposal of a Computer System Project to be Conducted in Partial Fulfillment of the Requirements of the Degree of Bachelor of Science in Information Technology

Information Technology Department

Jomo Kenyatta University of Agriculture and Technology

2012

Supervisor:

Name ……………………….. Signature ………………………

# Abstract

# Declaration

I declare that this is my original project and the idea has not yet been presented in any of the degree or diploma for examination purposes.

NAME: LEKINA MEMUSI ERICK

REG NO: BIT-001-0119/2009

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approval

SUPERVISOR: MR. OYIER

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Table of contents

Table of Contents

[Abstract i](#_Toc340614543)

[Declaration ii](#_Toc340614544)

[Table of contents iii](#_Toc340614545)

[1.0 Introduction 1](#_Toc340614546)

[1.1 Problem statement 2](#_Toc340614547)

[1.2 Proposed solution 3](#_Toc340614548)

[1.3 Objectives 4](#_Toc340614549)

[1.4 Research questions 5](#_Toc340614550)

[1.5 Justification 6](#_Toc340614551)

[2.0 Methodology 7](#_Toc340614552)

[2.1 The unified Process 7](#_Toc340614553)

[2.2 Phases of Design Cycles 7](#_Toc340614554)

[2.2.1 Inception: 7](#_Toc340614555)

[2.2.2 Elaboration: 7](#_Toc340614556)

[2.2.3 Construction: 7](#_Toc340614557)

[2.2.4 Transition: 7](#_Toc340614558)

[3.0 RESOURCES 8](#_Toc340614559)

[3.1 Hardware Requirements 8](#_Toc340614560)

[3.2 Software Requirements 8](#_Toc340614561)

[4.0 BUDGET AND BUDGET JUSTIFICATION 9](#_Toc340614562)

[4.1 BUDGET 9](#_Toc340614563)

[4.2 BUDGET JUSTIFICATION 9](#_Toc340614564)

[5.0 PROJECT SCHEDULE 10](#_Toc340614565)

[5.1 Time Plane 10](#_Toc340614566)

LIST OF TABLES

[Table 1: BUDGET AND BUDGET JUSTIFICATION 9](#_Toc340611580)

[Table 2 :SCHEDULE 10](#_Toc340611581)

[Table 3:GANT CHART 11](#_Toc340611582)

# Introduction

Jomo Kenyatta University of agriculture and technology is a technological institution located in Nairobi regions and it’s approximately 20 kilometers from Thika town.

The university has a number of departments each offering different courses and one of this departments is the department of information technology.

The department is located in hall 7 fourth floor and has a number of classes ranging from certificate classes all the way to BSC degree classes. Each class has a population of about 100 students.

From the above analyses the department has quit some large population.

## Problem statement

In the department of information technology most lecturers pass their information to the students through the class representatives who are expected to pass the same information to all the students in their respective classes.

This usually presents a problem because of the size of the classes involved and in most cases the message being passed does not reach to all the students targeted in the respective class.

Apart from the lectures passing information to the student’s via the class representatives the department also is usually faced with the same challenge of passing information to the students.

For some time now the department has been using notice boards to pass information to the students and this has some problems because for some reason not everybody is usually able to check the notice board each day and for short deadline notice messages will always pass unnoticed reaching only a small percentage of the targeted student population.

Another big challenge is that the system (Current manual notice boards) can only be used while the students are on session.

## Proposed solution

As a result of the problems stated I propose to develop a computer system that will automate the manual notice board functions and allow notice board messages to be passed to all the targeted population using SMS and Email technology.

The system will be distributed allowing online access to the system so as to allow the notice board messages to be passed at any time by the notice board administrator.

## Objectives

My objectives are:

1. Develop a computer system that allow for the automation of the manual notice board functions by using SMS and Email technology.
2. Develop a generic SMS Gateway to be used for sending SMS via a modem from any C# program.
3. Conduct a literature review on how to implement REST based web services and how to use AT commands to communicate with modems attached to the serial ports.

## Research questions

1. How do you implement a REST web service on an online distributed system?
2. How do you use AT commands to help control communication with modems connected on serial ports using C# for sending, receiving, reading and deleting SMS?

## Justification

Automation of the system will have a number of benefits to the department which justify the development of the system this includes:

1. Incase important notice messages are being passed to the students from the department or from their lectures all students are guaranteed to get the message as it will be forwarded to their phone as an SMS messages and to their Email accounts as long as the student’s phone number and email address is in the system.
2. The system will also allow for the messages to be sent to the respective target audience at any point in time (e.g. at night, day time or even during school holidays) and therefore this will ensure that urgent messages are passed effectively.
3. This system will also address the issue of some rogue students who delete mails from the class email account (e.g. notes sent by the lectures) or even physically remove the notice board messages from the notice board because with this system this messages will be forwarded to the individual students email accounts where no one can delete them.
4. An SMS will also be sent to each of the students to inform them that some notes or a notice board message has been sent to their email account and no student will complain that they did not get the notes.

# Methodology

## The unified Process

The unified process is a traditional cathedral style of incremental design driven by constructing views of system architecture.

It has the following key features:

1. It is component based, commonly being used to coordinate object oriented programming projects.
2. It uses UML a diagrammatic notation for object oriented design.
3. The design process is anchored, and driven by use cases which help keep sight of the anticipated behaviors of the system.
4. It is architecture centric and its design is iterative and incremental via a prescribed sequence of design phases within a cyclic process.

## Phases of Design Cycles

Design in the unified Process proceeds through a series of cycles, each of which has the following phases:

### Inception:

Produces a commitment to go ahead and by the end of this phase a business case should have been made, feasibility of the project assessed, and the scope of the design should be known.

### Elaboration:

Leads to a working specification of the system and the end of this phase a basic architecture should have been produced a plan of construction agreed, all significant risks identified, and those risks considered to be major should have been addressed.

### Construction:

Produces beta-release system and the end of this phase a working system should be available, sufficient for preliminary testing under realistic conditions.

### Transition:

Introduces the system to its intended users

# RESOURCES

## Hardware Requirements

1. Computer system with the following specifications:
2. Memory (RAM) - 1GB and above recommended.
3. Hard disk space - 80 GB or above of available hard disk space.
4. C.P.U –processor 1.6 GHz or higher
5. A server computer with the above specification too will be needed
6. A modem

## Software Requirements

1. Windows 7 operating system or any version newer than windows XP.
2. Microsoft SQLSERVER
3. Microsoft visual studio 2010
4. Microsoft .net framework

# BUDGET AND BUDGET JUSTIFICATION

* 1. BUDGET

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **PRICE PER UNIT** | **NO. OF UNITS** | **TOTAL** **(KSH)** |
| Computer unit | 25000 | 2 | 50000.00 |
| Windows 7 | 12,000 | 1 | 11000.00 |
| Modem | 3000 | 1 | 3000.00 |
| Total |  |  | 64000.00 |

Table 1: BUDGET AND BUDGET JUSTIFICATION

* 1. BUDGET JUSTIFICATION

### 

# PROJECT SCHEDULE

## Time Plane

Table 2 : SCHEDULE

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Description** | **Duration**  **(Weeks)** | **Proposed Start date** | **Proposed Finish date** | **Actual Start Date** | **Actual Finish Date** | **Deliverables** |
| 1 | Project Identification | 1 | 24/9/12 | 30/9/12 | 28/09/12 | 05/10/12 | Problem statement definition |
| 2 | Draft Proposal  Writing | 1 | 05/11/12 | 12/11/12 | 05/11/12 | 10/11/12 | Draft Proposal |
| 3 | Final Proposal | 1 | 13/11/12 | 20/11/12 |  |  | Final Proposal |
| 4 | Literature Review | 1 | 22/11/12 | 29/11/12 |  |  | Literature review report |
| 5 | Data collection  And analyses | 2 | 14/01/13 | 28/01/13 |  |  | Requirements specification |
| 7 | System design | 3 | 29/01/13 | 14/02/13 |  |  | System design |
| 8 | System Development | 3 | 15/02/13 | 08/03/13 |  |  | Working System |
| 9 | Testing | 1 | 11/03/13 | 18/03/13 |  |  | Working System |
| 10 | Project Report | 1 | 19/03/13 | 26/03/13 |  |  | Project Report |

### 

* 1. **Gantt chart.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activities** |  | **Sep** | | | | **Oct** | | | | **Nov** | | | | **Dec** | | | | **Jan** | | | | **Feb** | | | | **Mar** | | | |
| **Week** | **Hrs** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** |
| Project Identification | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Draft Proposal  Writing | 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Final Proposal | 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Literature Review | 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Data collection and analyses | 12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| System design | 48 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| System Development | 48 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Testing and Implementation | 12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Project Report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 3: GANT CHART

KEY:

Proposed time  Actual time